The
ARCHITECT &
ENGINEER

JANUARY 1922

Published in San Francisco
50 cents a copy - $2.50 a year
The "Del Rey" Lavatory has been everywhere received with the greatest of enthusiasm.

The beauty of its square-pattern lines and wonderful lustre has caused it to be acclaimed among the most distinguished of all lavatories.
CLOVER BLOCK
Bellingham, Wash.
covered with a
PABCO 10-Year Roof

PABCO 10 and 20 Year Roofs are recognized throughout the West as the standard of the widely used re-enforced or built-up type. Their proved superiority over the felt and gravel type of roof is mainly due to the following advantages:

1. A complete and definite specification
2. Superior wearing qualities
3. Greater tensile strength
4. Highest grade materials
5. A proved method of construction
6. Low maintenance cost

These features, combined with the long experience and recognized responsibility of the manufacturers—The Paraffine Companies, Inc.—are the reasons why PABCO ROOFS appeal to Architects, Engineers and owners alike.

Write for Specifications and complete details

THE PARAFFINE COMPANIES, INC.
San Francisco, California
"Standard"

THIRTY-SIX years experience manufacturing and installing Electric Time Keeping Systems. Helpful engineering data cheerfully furnished architects, engineers and school boards, insuring satisfactory results, and a direct factory branch office completely equipped to render immediate service.

The Standard
Electric Time Company
461 Market St., San Francisco, Cal.
Telephone Sutter 241

DEPENDABILITY "Since 1858"
LINOLEUMS WINDOW SHADES
Carpets Draperies Rugs
Estimates Furnished
D. N. & E.
Walter & Co.
562-572 Mission Street
SAN FRANCISCO

PROMETHEUS

The Electric Food and Plate Warmer
Wherever meals are cooked and served, in apartments, residences and institutions, Prometheus is a highly valued asset. The wire- less heating units placed independently of the shelves keep food hot and tasty until ready to serve and cannot injure the finest china.

Write for information and list of installations:
The Prometheus Electric Co.
Manufacturers
511 West 42d Street, New York
Showroom, M. E. HAMMOND
Mezzanine Floor Pacific Bldg., San Francisco

MARBLE BATHS

The Architect and Engineer—JANUARY, 1922—Vol. LXVIII, No. 1 Published monthly—$2.50 a year.
627 Foxcroft Building, San Francisco, California. Entered as second-class matter, November 2, 1905, at the Post Office at San Francisco, California, under the Act of March 3, 1879.
STEEL BARS
FOR
CONCRETE REINFORCEMENT

CORRUGATED TWISTED SQUARES OR ROUNDS CUT TO LENGTH

FABRICATED AND INSTALLED LUMP SUM BIDS ON WORK COMPLETE

Office, 444 MARKET STREET
Warehouse, 10th and Bryant Streets
Phone: Sutter 2720

"HYDRATITE" FOR WATERPROOFING AND HARDENING CONCRETE "HORNSTONE"

Faster Work — More Efficiency

Daylight and fresh air insure increased production

Truscon Daylight Sash

provides invigorating air and healthful, cheery sunlight. All sizes of Truscon Steel Sash carried in stock in the San Francisco Warehouse.

Largest stock of fireproof material and reinforcing bars on the Pacific Coast.

TRUSCON STEEL COMPANY
CHAS. HOLLOWAY, JR., Branch Manager
527 Tenth Street, San Francisco

When writing to Advertisers please mention this magazine.
Beams, Angle, Channels, and Universal Mill Plates for immediate shipment from stock

Pacific Rolling Mill Co.
SUPPLIERS OF
FABRICATED STRUCTURAL STEEL, Forgings, Bolts, Rivets, Frogs, Switches, Cast Iron Castings

General Office and Works
17th and MISSISSIPPI STS., SAN FRANCISCO
Telephone Market 215

Western Iron Works

Steel Wheel-barrows in Stock
STRUCTURAL IRON AND STEEL CONTRACTORS

141-147 Beale St. and 132-148 Main St. SAN FRANCISCO
Phones: GARFIELD 2575-2576

Steel Frame, California State Building, Civic Center, San Francisco.

FABRICATED BY
THE PALM IRON AND BRIDGE WORKS (Incorporated)
15th and R Streets, Sacramento

Bliss & Faville, Architects

UNION CONSTRUCTION CO.
CONTRACTORS AND ENGINEERS
Steel for All Types of Building Construction and Bridges
All Classes of General Machinery  Tank and Pipe Work
Gold Dredges and Their Equipment

BALFOUR BLDG.,
San Francisco  Sutter 2790

Key Route Basin,  Oakland  Lakeside 6300

When writing to Advertisers please mention this magazine.
GRINNELL AUTOMATIC SPRINKLER
GRINNELL COMPANY
OF THE PACIFIC

General Builders Co., 322 Mission Bldg., San Francisco
Kewanee Water Supply System, Simonds Machinery Co., 117 New Montgomery St., San Francisco

BOOK BINDERS
Abbott Brady Printing Corp’n, 460 Fourth St., San Francisco
H. S. Crocker Co., 505 Market St., San Francisco

BONDS FOR CONTRACTORS
American Mutual Liability Insurance Co., Balboa Bldg., San Francisco
Bonding Company of America, Kehl Bldg., San Francisco
Bankers & Shippers Insurance Co. of New York, Insurance Exchange Bldg., San Francisco
Globe Indemnity Co., 444 California St., San Francisco
Fidelity & Casualty Co. of New York, Halfcourt Bldg., San Francisco
National Society Co. of New York, 105 Montgomery St., San Francisco

BRASS GOODS, CASTINGS, ETC
H. Mueller Manufacturing Co., 635 Mission St., San Francisco

BRICK, PRESSED, PAVING, ETC
Richmond Pressed Brick Co., Crowley building, San Francisco; Plant at Richmond, Cal.
United Materials Co., Crossley Bldg., San Francisco
Cannon & Co., Sacramento; and 77 O’Farrell street, San Francisco

BRICK & CEMENT COATING
Armurite and Concreta, manufactured by W. P. Fuller & Co., all principal Coast cities.
The Paraffine Companies, Inc., 34 First St., San Francisco
R. N. Nelson & Co., 151 Potrero Ave., San Francisco

BRICK STAINS
Samuel Cahot Mfg. Co., Boston, Mass., agencies in San Francisco, Oakland, Los Angeles, Portland, Tacoma and Spokane
Armorite and Concreta, manufactured by W. P. Fuller & Co., all principal Coast cities

BUILDERS’ HARDWARE
Joost Bros., agents for Russell & Erwin Hardware, 1053 Market St., San Francisco
Palace Hardware Company, Agents Corbin goods, 581 Market St., San Francisco

When writing to Advertisers please mention this magazine
An Index to the Advertisements

Page
Abbott-Brady Printing Corp.  151
All-in-One Plumbing Fixture Corp.  30
Alta Tile Co.  128
American Face Brick Ass'n.  133
American Mutual Liability Insurance Company  149
American Mail Chute  28
American Marble & Mosaic Co.  139
American Roll Mill Co.  139
American Window Glass Co.  22
Aberly Bros.  139
Atlas Heating & Ventilating Co.  146
Bacon, Edward R., Co.  28
Bad-Falk & Co.  145
Baird-Bailhache Company  34
Baldwin Locomotive Works  116
Bartlett, John M.  136
Bass-Hueter Co., 3rd Cover  152
Beckwith, Herbert  145
Benson & Benson  154
Bosley, O. A.  135
Bowser & Co., S. P.  41
Breuer, John  136
Brodie, Thomas  145
Bryant-Whitehead-Middleton Co.  153
Bruce, E. L., Co.  27
Bunting Iron Works  43
Bunting & Son  139
Bunton & Harris  155
Butte Electric & Mfg. Co.  155
Cabinet, Samuel (Inc.)  148
California Artistic Metal and Wire Co.  152
California Bisque Marble Co.  160
California Granite Co.  136
California Hydracal Engineer- ing and Supply Co.  110
California Steam and Plumbing Supply Co.  143
Camino Co.  40
Central Electric Co.  130
Central Wire Co.  132
Cobbeledge-Kibbe Glass Co.  39
Coleman, Alex  146
Colman & Spidel  146
Cook Belt Co.  38
Cook Marble Co.  13
Commercial Export & Import Co.  157
Cowell Lime & Cement Co.  148
Crowell Co.  45
Crittall Window Co.  41
Crocker, H. S., Co.  138
Day Co, Thos.  134
Del Monte Properties Co.  29
Denny & Robinson Co.  44
Dolan Wrecking & Construction Co.  158
Dreman Indus, Mfg. Co.  156
Drendel Elec. & Mfg. Co.  154
Duddfield Lumber Co.  158
Dunham, C. A., Co.  137
Electric Appliance Co.  128
Electric Sales Service Co.  136
Elevator Supplies Co.  150
Ellery Arms Co.  146
Federal Ornamental Iron Works  152
Fess System Co.  43
Fidelity & Casualty Co. of N.Y.  130
Frank Schiltz Co., Thos.  153
First National Bank  34
Flags, Edwin H., Scene Co.  16
Fontainella & Terta  142
Foulser & Goeppe  40
Fuller, W. P., Co.  23
Garfield & Co.  34
Gates, G.A. & Co.  150
General Boilers Co  156
General Fireproofing Co.  149
General Fourries Co.  149
Gilley-Schmidt Co.  140
Gladding, McBean & Co.  24
Gould, A. E.  153
Globe Indemnity Co.  150
Golden Gate Iron Works  152
Griffin Sheet Metal Works  145
Grinnell Co.  5
Gunn Carie Co.  5

Page
Haines, Jones & Cadbury  131
Hamilton, John E.  148
Hannah, J. D.  136
Hauser Window Co.  36
Haws Sanitary Drinking Faucet Co.  129
Hill, Hubbell Co.  141
Hillard, C. J., Co.  129
Holbrook, Merriam & Co.  158
Home Mfg. Co.  33
Hoosier Store  33
Hubbell, Harvey, Inc.  26
Hunt, Robt. W. & Co.  126
Hunter & Hudson  140
Illinois Engineering Co.  146
Independent Automatic Sprinkler Co.  10
Jackson, S. G.  150
Jarvis, T. F., Mfg. Co.  43
Johnson, S. T.  11
Johnson Service Co.  11
Joost Brothers  140
Kennedy Valve Mfg. Co.  143
Kissel, I. R.  142
Knittie-Cashel Co.  142
Knowles, A.  144
Lannon Bros. Mfg. Co.  158
Lange & Bergstrom  157
Larsen-Brigg Co.  145
Lawson & Veysey  136
Littlefield, R. W.  144
Los Angeles Iron Brick Co.  137
Lupiton Steel Sash  22
MacGruer & Simpson  131
McLaren, R. C.  153
MacRorie-McLaren Co.  153
Magner Bros.  140
Mangum & Godfrey Iron Works  117
Marshall & Stearns Co.  147
Martin & Fredericks  145
McCafferty Products Co.  157
McCray Refrigerator Co.  28
McLaughlin, Jas. L.  158
Medusa Stainless Cement  25
Meese & Gottfried  153
Meyers Safety Switch Co.  154
Michel & Pfeifer Iron Works  117
Montague Range & Furnace Co.  15
Monso Bros.  142
Moore Shipbuilding Co.  152
Mortenson Construction Co.  172
Mott Co. of California  173
Mueller Mfg. Co.  152
Mullen Mfg. Co.  158
Musket, W. E., Co.  13
Mysto Sons Keenan Co.  13
Nason, R. N. & Co.  9
National Mill & Lumber Co.  32
National Surety Co.  150
National Terro Cotta  121
National Tobacco Shale Co.  151
Nelson, James A.  18
Ne Page, McNamy Co.  155
Newberry Electric Co.  155
New York Beltung and Packing Co.  156
Norris Co., L. A.  28
Oak Flooring Mfrs' Ass'n  19
Ocean Shore Iron Works  132
Old Mission Portland Cement Co. & Wm's  35
Otis Elevator Co.  160
Pacific Coast Steel Company  151
Pacific Electric Co.  2
Pacific Fire Extinguisher Co.  12
Pacific Glass & Mfg. Co.  42
Pacific Heating Co.  146
Pacific Mfg. Co.  14
Pacific Materials Co.  34
Pacific Plumbing Fixtures 24 Cover
Pacific Porcelain Ware Co.  24
Pacific Rolling Mills  34
Palmer, P. A.  142
Paraffine Companies, Inc.  142
Parke, E. C.  144
Petroleum Sanitary Sink Co.  32
Phillips, Chas. T.  140
Pierce, W. H.  146
Pike's Peak Company  34
Pitkier Door Hanger  32
Pittsburg Water Heater Co.  19
Platt's Red Book  34
 Pope & Talbot  15
Prometheus Electric Co.  4
Quandt, A. & Son  125
Ray Manufacturing Co.  42
Raymond Granite Co.  152
Reinelt Construction Equip- ment Co.  126
Richards-Wiley Mfg. Co.  31
Roberts Mfg. Co.  134
Rolph, Milly & Co.  17
Ruegg Bros.  152
Rucker-Pulver Desk Co.  140
Ryan, M. E.  155
Safety Electric Co.  129
San Francisco Elevator Co.  11
Santa Fe Lumber Co.  15
Scott Co.  15
Schadder Steel Works  152
Schwerin, Wm. J.  140
Simmons, O. A.  130
Smith Machinery Co.  38
Sloane, W. J.  17
Smith-Booth & Co.  14
Smith & Egge Mfg. Co.  36
Sommer, I. M.  144
Soudal, Edward E.  132
Spencer Electric Co.  155
Spencer Elevator Co.  12
Sprague Electric Co.  14
Standard Electric Time Co.  4
Standard Fence Co.  145
Standard Metals Mfg. Co.  16
Standard Varnish Works  130
Stanley Works, The  115
Steelform Contracting Co.  144
St. Francis Hotel  26
Stockholm, Chas. & Son  136
Strible Hardwood Co.  134
Sunset Lumber Company  15
S. & S. Tile Co.  24
Taylor Galleries  157
Tittle, H. S.  157
Tomkins-Kid Marble Co.  157
Tormey Co.  140
Tropion Pottery Co.  117
Truscon Steel Co.  142
Uhl Bros.  38
Union Construction Co.  6
Union Elevated Co.  142
Unit Electric Co.  127
United Materials Co.  137
United States Mfg. Co.  137
U. S. Metal Products Co.  36
U. S. Steel Products Co.  159
Vermont Marble Co.  4
Victory Manufacturing Co.  141
Vont, Alfred H.  150
Vukicevich & Bagge  144
Wadsworth, Howland & Co., Inc  134
Walter, D. N., & E. Co.  4
Wayne Oil Tank & Pump Co.  39
Webb, C. F. & Co.  15
West, Howard & Co.  150
West Coast Elevator Co.  39
Western Blind & Screen Co.  9
Western Safety Mfg. Co.  154
Western Iron Works  7
Western Steel & Wire Co.  20
Williams, J. G., Corp.  119
Wilson, W. F., Co.  146
Witt, G. E., Co.  44
Zelinsky, D. & Sons  145
Zourni Drawn Metals Co.  21
Nason's Opaque Flat Finish
A Flat Washable Oil Paint, made in soft Kalsomine tints—a practical article for Walls, Ceilings, Etc. (Agency) for Tamm & Nolan Company's High Grade VARNISHES and FINISHES, made on the Pacific Coast to stand our climatic conditions.

R. N. NASON & CO. Paint Makers
151 Potrero Ave.—436 Market St., San Francisco—Portland-Seattle-Oregon

ARCHITECTS’ SPECIFICATION INDEX—Continued

BUILDING MATERIALS, SUPPLIES, ETC.
Abeel-Jenien Co., Call Bldg., San Francisco.
Waterhouse-Wilcox Co., 523 Market St., San Francisco.

CABINET MAKERS
Home Manufacturing Company, 543 Braman St., San Francisco.
Fink & Schindler Co., 218 13th St., San Francisco.
Mullen Manufacturing Company, 64 Rausch St., San Francisco.

CASEMENT WINDOW HARDWARE

CASTINGS
Victory Manufacturing Co., Madroon building, San Francisco.

CEMENT
Mt. Diablo, sold by Henry Cowell Lime & Cement Co., 2 Market St., San Francisco.

CEMENT EXTERIOR WATERPROOF PAINT
Armorite, sold by W. P. Fuller & Co., all principal cities.
Bay State Brick and Cement Coating, manufactured by Wadsworth, Howland Co., Boston.

CEMENT FLOOR COATING

CEMENT TESTS—CHEMICAL ENGINEERS
Robert W. Hunt & Co., 251 Kearny St., San Francisco.

CLAY PRODUCTS
Cannon & Co., Sacramento, Cal.
Gladding, McBean & Co., Crocker Bldg., San Francisco.

Los Angeles Pressed Brick Co., Frost Bldg., Los Angeles.
Tropico Pottery, Inc., Glendale, Cal.

CLOCKS—ELECTRIC TIME
Pacific Electric Clock Co., 516 Wells-Fargo Bldg., San Francisco.
Standard Electric Time Co., 461 Market St., San Francisco.

COLD STORAGE PLANTS
T. P. Jarvis Crude Oil Burning Co., 275 Connecticut St., San Francisco.

COMPOSITION FLOORS
"Linoleum" by Price Boering, Hill, Hubbard & Co., 113 Davis street, San Francisco; 410 San Fernando Bldg., Los Angeles.

CONCRETE CONSTRUCTION
Barrett & Hilp, 918 Harrison St., San Francisco.
Clinton Construction Co., 146 Townsend street, San Francisco.
K. E. Parker Co., Inc., Clinton Bldg., San Francisco.
P. A. Palmer, Madrono Bldg., San Francisco.
J. M. Sommer, 401 Balboa Bldg., San Francisco.
Steelform Contracting Company, 681 Market St., San Francisco.

CONCRETE HARDENER

CONCRETE MIXERS
Foote and Jaeger mixers sold by Edward R. Bacon Co., 51 Minna St., San Francisco, also Los Angeles.
Ransome mixers sold by the Garfield Co., Hearst Bldg., San Francisco.
Smith-Booth-Usher Co., San Francisco and Los Angeles.

CONCRETE REINFORCEMENT
United States Steel Products Co., San Francisco, Los Angeles, Portland and Seattle.
Pacific Coast Steel Company, Rialto Bldg., San Francisco.
Truscon Steel Co., 227 Tenth St., San Francisco.
Bald-Falk Co., Call-Building Bldg., San Francisco.

CONDUTS
Garnett Young & Co., 612 Howard St., San Francisco.

CONTRACTORS, GENERAL
Barrett & Hilp, 918 Harrison St., San Francisco.
R. W. Littlefield, 357 12th St., Oakland.
Lawton & Vezev, Call building, San Francisco; Plaza building, Oakland.

GLOBE AUTOMATIC SPRINKLERS
Will protect your building and business from destruction by fire and reduce your insurance rate. Write for estimates.

Pacific Fire Extinguisher Company
424-430 Howard Street, San Francisco
FIRE PROTECTION ENGINEERS
Manufacturing Plant, 298 Fremont St.
Independent Automatic Sprinkler Company
Fire Protection Engineers
72 Natoma Street, San Francisco

ARCHITECTS' SPECIFICATION INDEX—Continued

CONTRACTORS, GENERAL—Continued
K. E. Parker Co., Inc., Clunie Bldg., San Francisco.

Unit Construction Co., Phelan Bldg., San Francisco.
J. D. Hannah, 142 Sansome St., San Francisco.
John M. Bartlett, 337 Twelfth St., Oakland.
Chas. Stockholm & Son, Monadnock Bldg., San Francisco.
Herbert Beckwith, 333 Newton Ave., Oakland.
Collman & Specidel, 546 Monadnock Bldg., San Francisco.

Clinton Construction Company, 140 Townsend St., San Francisco.

Monson Bros., 251 Kearny street, San Francisco.
Fontana & Teza, 1682 Eddy Street, San Francisco.

Gen. Wagner, 251 Kearny street, San Francisco.
T. B. Goodwin, 180 Jessie St., San Francisco.

Lange & Bergstrom, Sharon Bldg., San Francisco.

Robert Trost, 26th and Howard Sts., San Francisco.

I. M. Sommer, 401 Balboa Bldg., San Francisco.
S. G. Jackson, 312th St., Oakland.

Jas. L. McLaughlin, 251 Kearny street, San Francisco.
Alfred H. Vogt, 185 Stevenson street, San Francisco.

CONTRACTORS' EQUIPMENT

Edward R. Bacon Co., 51 Minna St., San Francisco, and Los Angeles.
Garfield & Co., Hearst Bldg., San Francisco.
Smith, Booth-Usher Co., 60 Fremont St., San Francisco; 228 Central Ave., Los Angeles.

CONVEYING MACHINERY

Mende & Gottfried, San Francisco, Los Angeles, Portland and Seattle.

CONVENIENCE OUTLETS

Harvey Hubbell, Inc., Bridgeport, Conn., represented in San Francisco by Garnett Young & Co., 612 Howard street.

CRUSHED ROCK

Coast Rock & Gravel Co., Cali-Post Bldg., San Francisco.

DAMP-PROOFING COMPOUND


Gunn, Carle & Co., Inc., 444 First street, San Francisco.

Hill, Hubbell & Company, 115 Davis St., San Francisco.

"Pabco" Damp-Proofing Compound, sold by Farraffoe Co., 34 First St., San Francisco.

DOOR HANGERS

Pitcher Hanger, sold by National Lumber Co., 126 Market St., San Francisco.


Stanley Works, New Britain, Conn. Monadnock Bldg., San Francisco.


DRINKING FOUNTAINS


Crane Company, San Francisco, Oakland, and Los Angeles.

Pacific Porcelain Ware Co., 67 New Montgomery St., San Francisco.

Haines, Jone & Cadbury Co., 857 Folsom St., San Francisco.

DUMB WAITERS

Spencer Elevator Company, 166 7th St., San Francisco.


ELECTRICAL CONTRACTORS

Butte Electrical Equipment Company, 530 Folsom St., San Francisco.

Butte Electric & Manufacturing Co., 534 Folsom St., San Francisco.


Central Electric Company, 185 Stevenson street, San Francisco.

McKenny Co., 589 Howard St., San Francisco.

Newbury Electrical Co., 359 Sutter street, San Francisco.

Pacific Fire Extinguisher Co., 424 Howard St., San Francisco.

Glob Electric Works, 1959 Mission St., San Francisco.

M. E. Ryan, Redwood City, and 520 Clunie building, San Francisco.

H. S. Tillie, 766 Folsom St., San Francisco.

Spencer Electric Co., 355 12th street, Oakland.

Spott Electrical Co., 16th and Clay Sts., Oakland.

ELECTRIC PLATE WARMER

The Prometheus Electric Plate Warmer for residences, clubs, hotels, etc. Sold by M. E. Hammond, Pacific Bldg., San Francisco.

ELECTRICAL SUPPLIES AND EQUIPMENT

Garnett Young & Co., 612 Howard St., San Francisco.

Butte Electrical Equipment Co., 530 Folsom St., San Francisco.

Harvey Hubbell, Inc., Bridgeport, Conn., represented in San Francisco by Garnett Young & Co., 612 Howard street.

Safety Electric Company, 56-65 Columbia Square, San Francisco.


ELEVATORS

Oxie Elevator Company, Stockton and North Point, San Francisco.

Spencer Elevator Company, 166 7th St., San Francisco.

San Francisco Elevator Co., 860 Folsom street, San Francisco.

ENGINEERS—CONSULTING, ELECTRICAL, MECHANICAL

Chas. T. Phillips, Pacific Bldg., San Francisco.

Hunter & Jackson, Rialto Bldg., San Francisco.

ELEVATOR DOOR HARDWARE


ESTIMATOR—BUILDINGS AND ENGINEERING WORKS

Arthur Priddle, 185 Stevenson street, San Francisco.

PNEUMATIC WATER PRESSURE SYSTEMS
ALL SIZES AND TYPES—For Private Homes and Public Buildings

CALIFORNIA HYDRAULIC ENGINEERING AND SUPPLY CO.
80 Fremont Street
San Francisco
TEMPERATURE REGULATION
Johnson Service Company
(OF MILWAUKEE — ESTABLISHED 1885)
MANUFACTURERS AND INSTALLERS OF
JOHN H. JOHNSON
Humidity and Heat
controls for schools, residences, hospitals, banks, and all kinds of industrial plants—hot water and and water tank regulators, air and temperature reducing valves.

Rialto Bldg., SAN FRANCISCO 605 Van Nuys Bldg., LOS ANGELES

ARCHITECTS’ SPECIFICATION INDEX—Continued

FAIENCE TILE
Tropico Pottery Co., Inc., Glendale, Calif.

FENCES—WIRE
Standard Fence Co., 245 Market St., San Francisco, and 310 12th St., Oakland.

FILLING STATION EQUIPMENT
S. F. Bowser & Co., Inc., 612 Howard St., San Francisco.
Wayne Oil Tank & Pump Co., 631 Howard St., San Francisco, 830 S. Los Angeles St., Los Angeles.

FIRE ESCAPES
Michel & Pfeffer Iron Works, 1415 Harrison Street, San Francisco.
Palm Iron & Bridge Works, Sacramento, and Western Iron Works, 141 Balle St., San Francisco.

FIRE-PROOF DOORS
Forderer Corinace Works, 269 Potrero avenue, San Francisco.
U. S. Metal Products Co., 330 10th Street, San Francisco.
Fire Protection Products Co., 3117 20th Street, San Francisco.

FIRE SPRINKLERS—AUTOMATIC
Grinnell Co., 453 Mission St., San Francisco.
Independent Automatic Sprinkler Co., 72 Natoma Street, San Francisco.
Pacific Fire Extinguisher Co., 424 Howard St., San Francisco.

FIRE RETARDING PAINT
The Paraffine Co., Inc., 34 First St., San Francisco.

FIXTURES—BANK, OFFICE, STORE, ETC.
Home Manufacturing Co., 543 Brannan St., San Francisco.
The Fink & Schindler Co., 218 13th St., San Francisco.
Mullen Manufacturing Co., 64 Rausch St., San Francisco.
C. F. Weber & Co., 985 Market St., San Francisco, and 210 N. Main St., Los Angeles, Calif.

FLOOR TILE
Mangrum & Otter, 827 Mission St., San Francisco.
S. S. Tile Co., San Jose.

FLOOR VARNISH
Bass-Huster and San Francisco Pioneer Varnish Works, 816 Mission St., San Francisco.
Fifteen for Floors, made by W. P. Fuller & Co., San Francisco.

FLOORS—HARDWOOD
Oak Flooring Manufacturers’ Association of the United States, Ashland Block, Chicago, Ill.
Parrott & Co., 320 California St., San Francisco.
Strable Hardwood Co., 511 First Street, Oakland.

FLOORS—MASONITE
Hill, Hubbell & Co., 115 Davis St., San Francisco.

FLOORS—SPRINKLERS—WARM AIR
Mangrum & Otter, 827 Mission St., San Francisco.
Montague Range and Furnace Co., 826 Mission St., San Francisco.

FURNITURE—BUILT-IN
Hooper Kitchen Cabinet Store, Pacific Bldg., San Francisco.

FURNITURE—SCHOOL, CHURCH, OFFICE, HOUSE, ETC.
Home Manufacturing Co., 543 Brannan St., San Francisco.
Rucker-Fuller Desk Co., 677 Mission St., San Francisco.

GARAGE HARDWARE
The Stanley Works, New Britain, Conn., Coast Sales, San Francisco, Los Angeles and Seattle, Wash.
California Hydraulic Engineering & Supply Co., 70-72 Fremont St., San Francisco.

GAS STEAM RADIATORS—FUMELESS, ETC.
Ra-Do Fumeless Gas Radiators, manufactured and sold by Baird-Bailhache Co., 478 Sutter St., San Francisco.

GLASS
American Window Glass Co., represented by L. H. Butcher Co., 862 Mission St., San Francisco.
Cobleeck-Kibbe Glass Co., 173 Jessie St., San Francisco.
Fuller & Goepf, 32 Page St., San Francisco, and Syndicate Building, Oakland.
W. P. Fuller & Co., all principal Coast cities.

GRADING, WRECKING, ETC.
Dolan Wrecking & Construction Co., 1607 Market St., San Francisco.

GRANITE
Raymond Granite Co., Potrero Ave. and Division St., San Francisco.

JOHN A. PETERSON, President
H. HEINRICH, Vice-President
SAN FRANCISCO ELEVATOR CO., Inc.
ELEVATORS
Automatic, Electric, Hydraulic, Belt Power, Automatic Dumbwaiters and Handpower Machines. Push Button Passenger Elevators a Specialty
Telephone Kearny 2443
860 FOLSOM STREET, SAN FRANCISCO
ARCHITECTS' SPECIFICATION INDEX—Continued

LIGHT, HEAT AND POWER
Great Western Power Company, Stockton St., near Sutter, San Francisco.

LIGHTING FIXTURES
Thomas Bay Company, Mission, near Third street, San Francisco.
Roberts Mfg. Co., 663 Mission St., San Francisco.

LIME
Henry Cowell Lime & Cement Co., 2 Market St., San Francisco.

LINOLEUM
D. N. & E. Walter & Co., 562 Mission St., San Francisco.
The Paraffine Companies, factory in Oakland; office, 34 First St., near Market, San Francisco.
W. J. Slone, 216 Sutter street, San Francisco.

LUBRICATING OIL STORAGE TANKS AND PUMPS
S. F. Bowser & Co., Inc., 612 Howard St., San Francisco.

LUMBER
Dudfield Lumber Co., Palo Alto, Cal.
Hart-Wood Lumber Co., Fifth and Berry Sts., San Francisco.
Pepe & Talbot, foot of Third St., San Francisco.
Santa Fe Lumber Co., 16 California street, San Francisco.
Sunset Lumber Company, First and Oak Sts., Oakland.

MASONRY FLOORING, STUCCO, ETC.

MAIL CHUTES
American Mailing Device Corp., represented on Pacific Coast by Waterhouse-Wilcox Co., 523 Market St., San Francisco.

MANTELS
Mangrum & Otter, 827-831 Mission St., San Francisco.

MANUAL TRAINING EQUIPMENT
Smith Booth-蹼er Co., San Francisco and Los Angeles.

MARBLE
American Marble and Mosaic Co., 25 Columbus Square, San Francisco.
Ray Cook Marble Company, foot of Powell street, Oakland.
Joseph Musto Sons, Keenan Co., 535 N. Point St., San Francisco.
Vermonia Marble Co., Coast branches, San Francisco, Portland and Tacoma.
Timken's Kiel Marble Company, 505 Fifth Ave., New York; also Chicago, Philadelphia and San Francisco.

METAL DOORS AND WINDOWS
Fire Protection Products Co., 3117 20th St., San Francisco.
Waterhouse-Wilcox Co., Inc., 523 Market St., San Francisco.
U. S. Metal Products Co., 330 Tenth St., San Francisco.

METAL FURNITURE
Forderer Cornice Works, 269 Potrero avenue, San Francisco.

MILL WORK
Dudfield Lumber Co., Palo Alto, Cal.
Pacific Manufacturing Company, San Francisco, Los Angeles, Oakland and Santa Clara.
National Mill and Lumber Co., San Francisco and Oakland.
The Fink & Schindler Co., 218 13th St., San Francisco.

OFFICE EQUIPMENT
Rucker-Fuller Co., 677 Mission St., San Francisco.
F. W. Wentworth & Co., 539 Market St., San Francisco.

OIL BURNERS
Fess System Co., 220 Natoma St., San Francisco.
S. T. Johnson Co., 1337 Mission St., San Francisco.
G. E. Witt Co., 652 Howard St., San Francisco.
F. L. Warner, 696 26th St., Oakland.

OIL STORAGE AND DISTRIBUTING STATIONS
S. F. Bowser & Co., Inc., 612 Howard St., San Francisco.
S. T. Johnson Co., 1337 Mission St., San Francisco.
Wayne Oil Tank & Pump Co., 631 Howard St., San Francisco; 810 S. Los Angeles St., Los Angeles.

ORNAMENTAL IRON AND BRONZE
California Artistic Metal and Wire Co., 149 Seventh St., San Francisco.
Federal Ornamental Iron and Bronze Co., 16th St. and San Bruno Ave., San Francisco.
Michel & Pfeffer Iron Works, 1415 Harrison street, San Francisco.
Palm Iron & Bridge Works, Sacramento.
Schrader Iron Works, Inc., 1247 Harrison St., San Francisco.

OVERHEAD CARRYING SYSTEMS
California Hydraulic Engineering & Supply Co., 70-72 Fremont St., San Francisco.

RAY COOK MARBLE CO.
IMPORTED AND DOMESTIC MARBLES
For Building Construction

Factory and Office, Foot of Powell St., Oakland

Phone Piedmont 1009
ARCHITECTS' SPECIFICATION INDEX—Continued

PAINT FOR STEEL STRUCTURES, BRIDGES, ETC.
The Paraffine Companies, Inc., 34 First St., San Francisco.
Hill, Hubbell & Company, 115 Davis street, San Francisco.
Wadsworth, Howland Co., makers of Bay State Brick and Cement Coating, Boston, Mass.
James Hambly & Son, Distributors in San Francisco and Los Angeles.

PAINTING, TINTING, ETC.
Atherly Bros., 2032 Polk St., San Francisco.
Wayne & Williams, 1914 Fillmore St., San Francisco.
I. R. Kissel, 1747 Sacramento St., San Francisco.
D. Zeilinsky & Sons, San Francisco and Los Angeles.
The Torney Co., 681 Geary St., San Francisco.
Fick Bros., 475 Haight St., San Francisco.
A. Quandt & Son, 374 Guerrero street, San Francisco.

PAINTS, OILS, ETC.
Magner Bros., 414-424 Ninth St., San Francisco.
W. F. Fullen & Co., all principal Coast cities.

PARTITIONS—FOLDING AND ROLLING

PIPE—STEEL AND WROUGHT IRON
Western Pipe & Steel Co., 444 Market St., San Francisco; 1758 N. Broadway, Los Angeles.

PIPE FITTINGS

PLASTER
"Arden" brand, A. C. Robertson, Builders Exchange, San Francisco; U. S. Gypsum Co.

PLUMBING FITTINGS
A. G. Spalding & Bros., 625 Market St., San Francisco.

PLUMBING CONTRACTORS
Alex Coleman, 706 Ellis St., San Francisco.
Thomas Brodie, 2119 Fillmore street, San Francisco.
Hateley & Hateley, Mitas Bldg., Sacramento.
Scott Co., Inc., 243 Minna St., San Francisco.
Wm. F. Wilson Co., 328 Mason St., San Francisco.
W. H. Picard, 5656 College avenue, Oakland.

PLUMBING FIXTURES, MATERIALS, ETC.
All-In-One Plumbing Fixture Corporation, 231 Oshner building, Sacramento.
California Steam & Plumbing Supply Co., 671 Fifth St., San Francisco.
Crane Co., San Francisco, Oakland, Los Angeles.
Gillely-Schmid Company, 198 Otis St., San Francisco.
Haines, Jones & Cadbury Co., 857 Folsom St., San Francisco.
H. Mueller Manufacturing Company, 635 Mission St., San Francisco.
Holbrook, Merrill & Stetson, 64 Sutter St., San Francisco.
J. L. Mott Iron Works, D. H. Gulick, selling agent, 553 Mission St., San Francisco.
Pacific Sanitary Manufacturing Co., 67 New Montgomery St., San Francisco.
Standard Mosaic Mfg. Co., 1300 N. Main St., Los Angeles; 216 Hobart building, San Francisco.

West Coast Porcelain Manufacturers, Rialto building, San Francisco.
Wm. F. Wilson Co., 328 Mason St., San Francisco.

POLES AND PILING
Santa Fe Lumber Co., 16 California street, San Francisco.

POWER PLANTS
Knittle-Cashel Co., Inc., 224 Fifth St., San Francisco.

POWER TRANSMITTING MACHINERY

PRELIMINARY ESTIMATES, VALUATIONS
Arthur Friddle, 185 Stevenson street, San Francisco.

PUBLIC QUANTITY SURVEY PLAN
Arthur Friddle, 185 Stevenson street, San Francisco.

PUMPS
Chicago Pump Co., represented by Garnett, Young & Co., 612 Howard St., San Francisco.
California Hydraulic Engineering & Supply Co., 70 Fremont St., San Francisco.
Simonds Machinery Co., 117 New Montgomery St., San Francisco.
Ocean Shore Iron Works, 558 Eighth St., San Francisco.

PUMPS—WATER OR POWER, FOR OIL AND GASOLINE
S. F. Bowser & Co., Inc., 612 Howard St., San Francisco.
S. T. Johnson Co., 1337 Mission St., San Francisco.
Wayne Oil Tank & Pump Co., 631 Howard St., San Francisco; 830 S. Los Angeles St., Los Angeles.

QUANTITY SURVEYOR FOR CONTRACTORS
William J. Schwerner, 217 Rialto Building, San Francisco.

RADIATORS—ELECTRIC STEAM
Arthur Friddle, 185 Stevenson street, San Francisco.

RADIATOR TRAPS

REINFORCING STEEL
Edward L. Soule, Rialto Building, San Francisco.
Badt-Falk & Co., Call Bldg., San Francisco.
Pacific Coast Steel Co., Rialto Building, San Francisco.
Truscott Steel Co., 527 10th St., San Francisco.

REFRIGERATORS

ROOFING CONTRACTORS
Bender Roofing Company, Monadnock Bldg., San Francisco.

ROOFING AND ROOFING MATERIALS
"Malthoid" and "Ruberoid," manufactured by Paraffine Companies, Inc., San Francisco.
United Materials Co., Crossley Bldg., San Francisco.

RUBBER TILING
New York Belting and Packing Company, 518 Mission St., San Francisco.

SAFETY TREADS
Pacific Materials Co., 525 Market St., San Francisco.

SAND
Del Monte White Sand, Del Monte Properties Co., 401 Crocker Bldg., San Francisco.

SASH AND CABLE CHAINS
Smith & Egge Mfg. Co., Bridgeport, Conn.
Coast Associates, Rawlins & Smith, San Francisco and Los Angeles.

SCENIC PAINTING—DROP CURTAINS, ETC.
The Edwin H. Flagg Scenic Co., 1638 Long Beach Ave., Los Angeles.
THE ARCHITECT AND ENGINEER 15

SANTA FE LUMBER CO.
A. J. RUSSELL, Mgr.

Wholesale and Retail LUMBER

POLES AND PILING
OIL RIG AND SHIP TIMBERS
SAGINAW SPECIAL SHINGLES

16 California Street
San Francisco, Calif.

Phones:
Kearny 2073 - 2074

from tree to Consumer

Pine and Redwood Lumber
SASH DOORS AND MILL WORK

SUNSET LUMBER COMPANY
MANUFACTURERS—WHOLESALE AND RETAIL

Main Office and Yards:
FIRST AND OAK STREETS, OAKLAND
Phone Oakland 1820

POPE & TALBOT
Manufacturers, Exporters and Dealers in
Lumber, Timber, Piles, Spars, etc.

Office, Yards and Planing Mills
859-869 THIRD ST., SAN FRANCISCO, CAL.

Mills, Port Gamble, Port Ludlow and Utsalady, Washington

PACIFIC MANUFACTURING COMPANY
MILLWORK, SASH AND DOORS
Hardwood Interior Trim a Specialty

Main Office:
SANTA CLARA, CALIF.

SAN FRANCISCO, 177 Stevenson Street
OAKLAND, 1001 Franklin Street

LOS ANGELES, 908 Washington Building
SAN JOSE, 16 North First Street

When writing to Advertisers please mention this magazine.
ARCHITECTS’ SPECIFICATION INDEX—continued

THERMOSTATS FOR HEAT REGULATION
Johnson Service, Rialto Bldg., San Francisco.

TILE FOR ROOFS, MANTELS, ETC.
Cannan & Co., Sacramento; and 77 O’Farrell St., San Francisco.
Gladling, McLean & Co., Crocker Bldg., San Francisco.

TRANSMISSION MACHINERY
Mann & Coster Co., San Francisco, Los Angeles, Portland and Seattle.

VALVES—PIPES AND FITTINGS
California Steam & Plumbing Supply Co., 671 4th St., San Francisco.
Crane Radiator Valves, manufactured by Crane Co., Second and Brannan Sts., San Francisco.
Grinnell Co., 453 Mission St., San Francisco.
O. M. Simmons Co., 115 Mission St., San Francisco.
W. E. Muschet Co., 502 Mission St., San Francisco

VALVE PACKING
N. H. Cook Belting Co., 317 Howard St., San Francisco.

VARNISHES
W. F. Fuller Co., all principal Coast cities.
Standard Varnish Works, 55 Stevenson St., San Francisco.

VENETIAN BLINDS, AWNINGS, ETC.
Western Blind & Screen Co., 2702 Long Beach Ave., Los Angeles.

VITREOUS CHINAWARE
Pacific Porcelain Warehouse, 67 New Montgomery St., San Francisco.
West Coast Porcelain Manufacturers, Rialto Building, San Francisco.

WALL BENDS, SEATS, ETC.

WALL BOARD
“Amiwi” Wall Board, manufactured by The Paraffine Company, Inc., 34 First St., San Francisco.

WALL PAINT

WALL PAPER AND DRAPERY
Uhle Bros., San Francisco.

WATERPROOFING FOR CONCRETE, BRICK, ETC.
Bay State Brick & Cement Coating, manufactured by Wadsworth, Howland Co., Boston, Mass., and distributors for Northern and Southern California.
Pacific Materials Co., 525 Market St., San Francisco.

WATER SUPPLY SYSTEMS
Kewanee Water Supply System—Simonds Machinery Co., agents, 117 New Montgomery St., San Francisco.
Smith-Booth-Uscher Co., San Francisco and Los Angeles.

WHEELARROWS—STEEL
Western Iron Works, Beale and Main Sts., San Francisco.

WHITE ENAMEL
“Satinette,” Standard Varnish Works, 55 Stevenson St., San Francisco.

WINDOW SASH CHAIN
The Smith & Eger Mfg. Co., Bridgeport, Conn.

WINDOW SHADES
National Window Shade Co., Inc., 244 Eddy Street, San Francisco.
W. & J. Sloane, 216 Sutler street, San Francisco.
D. N. & E. Walter, 562 Mission street, San Francisco.

WINDOWS, REVERSIBLE, CASEMENT, ETC.
Crittall Casement Window Co., Detroit; Waterhouse & Wilcox, San Francisco, representatives.
Hausser Window Co., 157 Minna St., San Francisco.

WIRE FENCE
Standard Fence Co., 245 Market street, San Francisco; and 310 12th street, Oakland.

WOOD MANTELS
Fink & Schindler, 218 13th St., San Francisco.
Mangrum & Otte, 827 Mission St., San Francisco.

LINOLEUMS
WINDOW SHADES
CARPETs
FURNITURE
MOTT PLUMBING FIXTURES
Architects and their clients are invited to visit our Showrooms, 553-555 Mission Street, San Francisco; D. H. Gulick, Sales Agent. Los Angeles Office, 603 Central Building: J. R. Mayhew, Sales Agent.
Mott Company of California

MUeller - BRASS GOODS
Recognized as the Standard of excellence in plumbing. It pays to use them, and other Mueller Brass Goods. The first cost is practically their last cost.
635 MISSION STREET, SAN FRANCISCO, CAL.

Winter is Here
Specify STORM KING and AMERICAN WARM AIR FURNACES and insure warmth for your client in his new home
Furnace Fittings and Repairs
Montague Range and Furnace Company
327-329 JESSIE STREET  Phone Garfield 1422 826-830 MISSION STREET
SAN FRANCISCO, CALIF.

DON'T NEGLECT YOUR HEATING SYSTEM.
THE BEST IS NONE TOO GOOD!

JAMES A. NELSON
Heating and Ventilating Contractor
Phone, Garfield 1959  517-519 SIXTH ST., SAN FRANCISCO

When writing to Advertisers please mention this magazine.
Many cases are reported where Japanese Oak Flooring, laid down by ill-advised builders, has had to be ripped up in a short time, at a heavy cost, and replaced by the American-grown.

Japanese Oak betrays itself to the expert by its porous, brashy nature, its lack of the beautiful grain of the domestic, and its tendency to warp.

While we know that no architect would recommend such a costly substitution to a client, we ask the profession to co-operate with us in warning the public against the inferior foreign product.

We will be glad to send you our free booklets, in colors, which contain much accurate information about Oak Flooring for your ready reference files.

OAK FLOORING, MERSANO
1036 Ashland Block, Chicago, Ill.
“Simple—Strong—Efficient”
That’s what users say of the

STEWART
Tilting Drum

CONCRETE MIXERS
with
Hercules Engine drive
And there’s one thing more to add—they’re

Reasonably Priced

For sale by

Smith-Booth-Usher Co.
CONTRACTORS and INDUSTRIAL EQUIPMENT

SAN FRANCISCO
50-60 Fremont Street

LOS ANGELES
228-238 Central Avenue

Everything OPENLY PRICED in our Illustrated Priced Stock Bulletin.

Steel Water Tanks
For High Buildings

For high pressure Water Systems, Automatic Fire Sprinklers, etc.

ALSO:
Designers, Fabricators and Erectors of General Plate Work, including Hydro-Pneumatic Pressure Tanks, Hemispherical Bottom Tanks and Towers, Oil and Water Tanks, Pipe Lines, Etc. “Western” Corrugated Culvert Pipe

Western Pipe and Steel Company
OF CALIFORNIA

444 MARKET STREET
SAN FRANCISCO

1758 NORTH BROADWAY
LOS ANGELES

When writing to Advertisers please mention this magazine.
You Can Save

A great deal of money for your clients if you install a window construction that makes plate glass breakage next to impossible.

Insurance companies may reimburse you for the loss of the glass in case it breaks, but there is no way to recover the tremendous loss of time and inconvenience while waiting for a new window to be installed. Minimize such risk by using

**ZOURI SAFETY METAL STORE FRONTS**

Glass breakage and faulty installation are next to impossible when Zouri construction is used. Zouri popularity and display values are universally acclaimed. Underwriters' Laboratories fully approves Zouri construction. It meets with the approval of a greater number of architects and engineers every year. If you don't already know about Zouri advantages

**Consult Our Nearest Representative**

We have 198 distributors in the United States and Canada, each carrying a complete stock of Zouri and International construction.

Ask either of the firms listed below for full particulars of Zouri construction

**COBBLEDICK-KIBBE GLASS COMPANY**
Oakland and San Francisco

**CALIFORNIA PAINT & GLASS CO.**
Los Angeles, California

**Zouri Drawn Metals Company**

Factories and General Offices:
CHICAGO HEIGHTS, ILLINOIS

When writing to Advertisers please mention this magazine.
The window glass throughout the splendid new Webster Hotel in Chicago is the product of the American Window Glass Company.

Distinctly a quality product American Window Glass meets exacting requirements in double or single strength. Its evenness and freedom from imperfections invariably win it preference.

American Window Glass Co.

General Offices, PITTSBURGH, PA.

Branches in leading cities as listed in Sweet's Catalog

Lupton

INVESTMENT VALUE

STEEL SASH PRODUCTS

Lupton Steel Sash Products represent more than so many square feet of windows at moderate cost.

They represent an idea—the idea of health, good workmanship and efficiency, due to ample fresh air and light.

Let us tell you about the different types of Lupton Steel Sash Products and how they may be used.

Represented by

WATERHOUSE-WILCOX CO.

San Francisco    Los Angeles    San Diego

*J. McCRAKEN CO.    H. G. LANAHAN & CO.    F. T. CROWE CO.

Portland    Spokane    Seattle    Tacoma

*In Warehouse Stock

When writing to Advertisers please mention this magazine.
Paint Guarantees

THE best guarantee that any paint or varnish can carry is the number of tests it must stand before it reaches the market. If "blind tests" are significant, then Fuller Paints and Varnishes are worth-while products.

Not only must our Paints and Varnishes stand the most searching chemical tests, but also the most exacting physical ones as well. Our technical experts employ these products to determine any weakness that they may develop, for Fuller Paints and Varnishes must come to you as nearly perfect as it is humanly possible to make them.

PIONEER WHITE LEAD has been specified by architects for years, because it has an unfailling habit of making good. Master and journeymen painters are pleased when Pioneer White Lead is used on the job.

FULLER'S WASHABLE WALL FINISH is a decorative and durable finish for interior walls of plaster, or wall board. The soft-toned colors lend themselves admirably to any decorating scheme.

FULLER'S SILKENWHITE ENAMEL for all interior work where a quality product is demanded. Obtainable in high gloss finish or Eggshell effect.

FULLER'S FIFTEEN FOR FLOORS is a varnish that is unexcelled in quick-drying, toughness, durability and beauty of finish properties. Resists the wear and tear of today's complex civilization. Not affected by hot and cold liquids.

FULLER'S FORTY FOR FINISHING VARNISH is purposely made to withstand moisture in kitchens, bathrooms and all rooms heated with steam.

FULLER'S FIFTY FOR FLATTING produces a dull finish giving with accuracy the effect of a rubbed varnish—incidentally saving the labor of rubbing.

We would appreciate the opportunity to tell you more about these products. May we?

W. P. FULLER & CO.

BOISE SACRAMENTO SPOKANE SEATTLE
TACOMA LOS ANGELES SAN DIEGO PASADENA
SANTA MONICA OAKLAND HOLLYWOOD PORTLAND
SAN FRANCISCO STOCKTON LONG BEACH FRESNO
SAN BERNARDINO WALLA WALLA SALT LAKE CITY
Steam Heating and Ventilating
For Commercial and Public Buildings
Furnace Heating for the Home
Mangrum & Otter, Inc.
827-831 Mission Street
Phone Kearny 3155
San Francisco, Cal.

S. & S. TILE CO. A. L. SOLON and E.P. SCHEMMEL
MANUFACTURERS OF
HAND-MADE TILES FOR WALLS AND FLOORS.
REPRODUCTIONS OF OLD SPANISH AND MOORISH GLAZED TILES.
Factory, 4th and Carrie Sts. San Jose, Cal.

Highest Standard of Quality Complete and Dependable Service
TROPICO POTTERIES, Inc.
Successors to PACIFIC MINERALS AND CHEMICAL COMPANY
GLENDALE, CALIF.
ARCHITECTURAL TERRA COTTA
VITRIFIED CLAY SEWER PIPE FAIENCE TILE
TERRA COTTA FLUE LINING DRAIN TILE
TERRA COTTA CHIMNEY PIPE WATER PIPE

GLADDING, McBEAN & CO.
MANUFACTURERS CLAY PRODUCTS
CROCKER BUILDING, SAN FRANCISCO
WORKS, LINCOLN, CAL.

When writing to Advertisers please mention this magazine.
Residence of Mr. George E. Nicholson, Kansas City, Missouri. The walls are of 12-inch interlocking tile, and the stucco, made with Medusa Stainless White Cement and aggregates, is applied directly on the tile. It has a light body, finished with a dash coat of white quartz pebbles. Messrs. Wight & Wight, Kansas City, Architects.

"Just the way we hoped it would look"!

Medusa Stainless White Cement helps interpret your plans and makes reality of the client's hopes. Its clean, crisp freshness is permanent; the charm of a Medusa White Stucco house increases year by year, along with the growing things massed about it. This pure white, non-staining Portland Cement serves your interests in a host of ways: stucco construction, mortar for setting marble, granite, terra cotta, face brick, etc.; interior wall plaster, terrazzo and similar work; ornamental building trim, garden furniture, statuary, and many more.

**Waterproofed** Medusa Stainless White Cement contains Medusa Waterproofing in the correct proportions, thoroughly ground into the cement at the mill. It should be used in all cement work where it is desirable to exclude dampness permanently. Medusa is the original integral waterproofing.

We are exclusive manufacturers of Waterproofed White Cement.

Interesting and helpful booklets, in standard architectural size, will be gladly sent upon request.

THE SANDUSKY CEMENT COMPANY, Department P, Cleveland, Ohio
Manufacturers of Medusa Stainless White Cement (Plain and Waterproofed); Medusa Gray Portland Cement (Plain and Waterproofed); and Medusa Waterproofing (Powder or Paste).

PACIFIC COAST DISTRIBUTORS:
A. McMillan & Co., Portland, Ore.
Riverside Portland Cement Co., Los Angeles, Cal.
The Ford car unfailingly answers the needs of the man who desires economical and dependable motor transportation.

The Ford is a valuable ally of the business concern and indispensable to the salesman or the sales force that wishes to cover an extensive territory at the least cost and with the greatest speed.

For eighteen years, we have catered to the needs of the Ford buying public. In our new location and our new building at 11th and Market streets we are in a better position than ever to serve.

Visit our new sales and service quarters. Night service in the garage.

William L. Hughson Co.
Since 1903
Market at 11th St., San Francisco
Park 4380
Seattle Portland Oakland Los Angeles San Diego
American Oak Flooring  
For American Homes

Use the material which has proved its vast superiority in more than One Hundred years' use as America's finest flooring.

Use American Oak Flooring because of its inherent beauty of grain and texture and because of its everlasting durability and economy.

Avoid the use of Japanese oak flooring. It is inferior in grain and texture, is brittle, "brashy" and porous, and of highly questionable value as flooring material.

We are manufacturers of the best American Oak Flooring, and endorse every piece with our own trade mark and that of the Association. Ask for these symbols and play safe.

E. L. BRUCE CO., Manufacturers  
MEMPHIS, TENNESSEE
The Gold Medal Mail Chute

Installed in the New San Francisco City Hall and the White Marble Merritt Building, Los Angeles.

Given highest award at Panama-Pacific International Exposition, 1915.

Waterhouse-Wilcox Co.
California Representatives
523 Market Street
San Francisco
331 L. 4th Street
Los Angeles
F. T. Crowe & Co.
Seattle, Wash.
The J. McCracken Co.
Portland, Oregon
American Mailing Device Corporation

McCray Refrigerators for All Purposes

It is our particular desire to impress the Architects of America with the fact that McCray builds refrigerators for all purposes. Thousands of fine residences, hotels, clubs, restaurants, factory cafeterias, hospitals, stores and markets depend on McCray for efficient, economical refrigerator service.

McCray Refrigerator Co.
765 Mission Street, San Francisco, Calif.
Home Office and Factory
Kendallville, Ind

Clinton Welded Wire Fabric and Lath


L. A. Norris Co.
140 Townsend Street
Phone Kearny 5375 San Francisco

McCray Refrigerator Co.
765 Mission Street, San Francisco, Calif.
Home Office and Factory
Kendallville, Ind

Not Only Mixers

but a full line of nationally-known equipment, as well.

We have prepared for a brisk building season.

"Get it from BACON"

Edward R. Bacon Company
51-61 Minna Street, San Francisco
165 E. Jefferson St.
Los Angeles

When writing to Advertisers please mention this magazine.
ARCHITECTS and engineers who conscientiously strive to give their clients satisfaction invariably choose Wayne equipment. Accuracy, dependability, economy, safety and long life are inherent qualities of Wayne gasoline and oil systems. Wayne engineers will gladly co-operate with you in working out any of your problems.

WAYNE OIL TANK & PUMP COMPANY
746 Canal Street
Ft. Wayne, Ind.
San Francisco Office
631-633 Howard Street
Phone Garfield 1350
Los Angeles Office
830 S. Los Angeles Street
Phone Main 1600

DEL MONTE &
FAN SHELL BEACH
WHITE SAND

With our WASHING and DRYING PLANT in full operation, we can now ship promptly above SANDS fresh water washed, and steam dried, or direct from pits.

Del Monte Properties Company
Phone Sutter 6130 401 Crocker Building San Francisco
Compare These Lavatories

**Old Style**

**All-in-One Lavatory**

Both lavatories are of the same type, the popular priced lavatory so much in use in the average bathroom of today; both sell for the same price—but in all other respects they are entirely different.

The old style lavatory has exposed metal parts and pipes underneath—the All-in-One Lavatory has no exposed metal parts, the entire fixture being finished in white enamel. The old style lavatory has two outlets, one for hot water and one for cold—the All-in-One, only one outlet with a special mixing device that blends the hot and cold water, enabling one to wash in running water of the correct temperature. The old style lavatory has a plug and chain—the All-in-One, a patented waste plug with spring and cap.

The All-in-One Lavatory eliminates all of these exposed metal parts and connecting joints by casting the hot and cold water inlets, waste pipe, overflow integral, faucets and soap cup with the fixture itself. It can be installed much more quickly than the old style fixture as there is only one connection to be made. It is much more attractive and is far easier to keep clean—and it costs no more than the old style lavatory.

All-in-One Lavatories are made in all the different styles. All-in-One Bathtubs are designed on the same principle and are made in all sizes and styles. Let us send you Free illustrated catalog fully describing All-in-One Plumbing Fixtures.

**All-in-One Plumbing Fixture Corp.**

231 Ochsner Building

SACRAMENTO, CALIF.

When writing to Advertisers please mention this magazine.
There is an added convenience as well as dignity in a vanishing French door. Such a door lends beauty to any home.

Every day sees an increasing number of homes being equipped with convenient vanishing French doors. The home builder is learning that the old-time sliding door type, with its faults, has been completely eliminated by the new R.-W. house door hanger—the hanger that allows the door to be easily and quickly operated without noise or jar of any kind. The special adjustment feature of R.-W. house door hardware makes it a general favorite with architects.

WRITE TODAY FOR OUR NEW CATALOG OC4

Sewage Ejectors  Bilge Pumps
Condensation Pumps and Receivers
Return Line Vacuum Pumps
Horizontal Centrifugal Pumps

CHICAGO PUMP COMPANY
Telephone: Douglas 4220

GARNETT YOUNG and COMPANY
612 Howard Street, San Francisco

SEATTLE  LOS ANGELES  PORTLAND

When writing to Advertisers please mention this magazine.
For the Exacting Client

Pitcher Hangers

Give Satisfaction

Smooth Running — Noiseless — Efficient
Inexpensive

MANUFACTURED BY

NATIONAL MILL & LUMBER CO.
318 Market Street, San Francisco, Cal.
Telephone Kearny 3580

Snow White

Built with a Clean Smooth Surface. Petrium Sanitary Sinks answer every requirement. They are non-porous, non-absorbent and lye-proof. There are no crevices or corners to catch the dirt and grease. Therefore Specify this sink. Can be installed in any home or apartment—new or old. A California product.

Display at
Hoosier Store, Pacific Bldg., San Francisco

Petrium Sanitary Sink Company
Factory and Office, West Berkeley

When writing to Advertisers please mention this magazine.
Book of Built-in Furniture

A Home You Would Like to Own
With Built-in Furniture

Cover Design THE BOOK OF BUILT-IN FURNITURE, showing complete line of PEERLESS BUILT-IN FURNITURE for new homes and apartments. This book is free for the asking.

THE
HOOSIER STORE
Pacific Building :: San Francisco
BUILDING BUSINESS

CALIFORNIA'S OLDEST NATIONAL BANK
HAS BEEN A VITAL FACTOR IN THE UPHOLDING
OF SAN FRANCISCO AND THE ENTIRE WEST.

WHEN LAYING PLANS FOR THE FUTURE OF YOUR
BUSINESS CONSULT THE OFFICERS OF THIS INSTITUTION

THE FIRST NATIONAL BANK OF SAN FRANCISCO
Affiliated with
FIRST FEDERAL TRUST COMPANY
Combined Resources $60,473,521.88

FOR MODERN STORE FRONTS

Plummer's Disappearing Awnings

Are constructed with no outside attachments below awning recess. All
mechanical parts entirely concealed. Send for Architects' Sheet showing
specifications for recess construction, etc.

W. A. PLUMMER MFG. CO., 35-37 Front Street, San Francisco

CONTRACTOR'S MACHINERY

RANSOME MIXERS OSHKOSH MIXERS
INSLEY SPOUTING PLANTS
OSHKOSH EVEREADY SAW RIGS INSLEY STEEL CARS and TRACKS
OSHKOSH STEEL CARS and TRACKS
HOISTING BUCKETS, HOPPERS, GATES, ETC.
STEAM AND ELECTRIC HOISTS
EVERYTHING USED BY CONTRACTORS
CARRIED IN STOCK BY
GARFIELD & CO.
Hearst Building, San Francisco Phone Sutter 1036

RA-DO FUMELESS GAS RADIATORS

ALL CAST IRON—3 Sizes (3, 5, and 7 Sections)
The Ideal "Year-Round" Heating System
For The Home—New or Old
Easiest and Cheapest to Install
Lowest Operating Cost
BAIRD - BAILHACHE COMPANY
MANUFACTURERS
478 Sutter St., San Francisco Phone Sutter 6858

When writing to Advertisers please mention this magazine.
Each shipment of "OLD MISSION" Portland Cement is guaranteed not only to equal but to surpass all requirements of the standard specifications for Portland Cement as adopted by the U. S. Government and by the American Society for Testing Materials. A Guarantee Certificate is mailed with the bill of lading of each car, giving number of car, date packed, and number of barrels, over the signature of the chief chemist.
SASH CHAIN

Made of
"Giant Metal," "Red Metal" and Steel
Further information on request. See page 1092 Sweet's Catalog

The Smith & Egge Mfg. Co.
Bridgeport, Connecticut

Originators of Sash Chain

RAWLINS & SMITH, Coast Agents
507 Mission St., San Francisco 515 I. W. Hellman Bldg., Los Angeles

AMERICAN-LARSON
SUCTION VENTILATOR

Economical Efficient
Will exhaust from 100% to 400% more air than any other ventilator.
It is the first ventilator designed on the siphon principle that applies that principal in a logical way.

Manufactured in California by
U. S. METAL PRODUCTS CO.
330 TENTH STREET SAN FRANCISCO
Phone Market 1150

Hauser Reversible

THIS Modern Apartment House in San Francisco designed by Architect E. E. Young, is equipped with the Hauser Type Fixture.

Manufactured and installed by

Hauser Window Co.

157 Minna Street, Phone
SAN FRANCISCO Kearny 3706

Window Fixtures

When writing to Advertisers please mention this magazine.
Among our assets we like to count the only one that money cannot buy — your good will.

And so at this Holiday Season we extend to you — not as a customer alone, but as a friend — the Best of Wishes
QUALITY HARDWARE

CORBIN

LOCKS AND BUILDERS’ HARDWARE

PALACE HARDWARE CO.

"San Francisco’s Leading Hardware Store"

581 MARKET STREET. SUTTER 6050

Kewanee Water System


Simonds Machinery Co.

117-121 New Montgomery St.
SAN FRANCISCO
Phone Kearny 1457

USE

"MURPHY’S"

VARNISHES AND ENAMELS

"QUALITY UNEXCELLED"

UHL BROS., Inc.

SEATTLE LOS ANGELES PORTLAND SAN FRANCISCO OAKLAND

Pack your Radiator Valves with

Palmetto Twist Packing

It can be unstranded to fit any size valve. It does not get hard.

H. N. COOK BELTING CO.

401-433 Howard St. San Francisco, Cal.

When writing to Advertisers please mention this magazine.
ELIMINATE the unsightly awnings — Preserve the exterior beauty of your buildings by Specifying WESTERN VENETIAN BLINDS

Some 1920 contracts for complete equipment:

- 12-story Mattie Building, Fresno, California
- 9-story Pantages Building, Los Angeles, California
- 7-story Marland Refining Bldg., Ponca City, Oklahoma
- 10-story Tradesmens Bank Bldg., Oklahoma City, Okla.
- 5-story Railway Exchange, Muskogee, Oklahoma

When you consider the fact that WESTERN VENETIAN BLINDS take the place of both awning and window shade and will last practically as long as the building stands you'll realize that they are the logical equipment for modern buildings.

When writing to Advertisers please mention this magazine.
Fuller & Goepp
32 Page Street, San Francisco
Telephone Market 499

MANUFACTURERS OF
ART AND LEADED GLASS
MIRRORS
Dealers in WHITE Glass for Table Tops, Counter Tops, Sink Backs, Etc. Complete Stock—Prompt Deliveries
Oakland Office, Syndicate Bldg. Tel. Oakland 1165

CANNON & CO.
Clay Products
Denison Interlocking Tile
Face Brick
Hollow Tile
Roof and Floor Tile

Factory and General Offices:
SACRAMENTO, CALIFORNIA

When writing to Advertisers please mention this magazine.
Specify Bowser

THE latest Bowser Piston-Type Measuring Pump (illustrated) is either hand or air-driven and exemplifies the high standard of service set by Bowser Equipment.

The motive power being air, the usual fire hazard in handling gasoline by power is eliminated.

Bowser Equipment accurately, economically and safely meets all requirements for gasoline and oil storage and service.

Whether it is in a garage, railroad, factory or dry cleaning plant, you are best serving your clients when you specify Bowser Equipment.

Write for Illustrated Booklet A-03

S. F. Bowser & Company, Inc.

1303 Creighton Ave., Fort Wayne, Indiana
Sales Offices (with Service Departments) throughout the United States and in Principal cities of the World.

612 Howard Street, San Francisco, Calif.

1225 So. Olive Street, Los Angeles, Calif.

LONDON PARIS HAVANA SYDNEY

Court View of noted Montecito, Calif. Residence
Francis T. Underhill, Architect, Santa Barbara, Cal.

CRITTALL
Steel Casements

for artistic residences and other substantial buildings

Made in varied designs to meet all conditions

Crittall Casement Window Co., Manufacturers
Detroit

When writing to Advertisers please mention this magazine.
Ray Rotary Fuel Oil Burners
For Steam and Hot Water Boilers
ADAPTED TO ANY TYPE OF BOILER OR FURNACE—High or Low Pressure, 10 to 300 H. P.

We pioneered and developed the horizontal type Rotary Burner. This principle is sound, as the trend of all burner design is toward this type.

Don't confuse the Ray with other Rotary Burners.

We are the largest manufacturers of Rotary Burners in the world. Recent contracts of the Westinghouse Electric Manufacturing Company covered over four thousand motors.

The Ray Oil Burning system is covered by twenty United States Patents.

This represents ten years of research and development work.

Can you afford to buy experiments—just born?

No matter what your troubles are we can eliminate them with the Ray system.

We guarantee the Ray to be the most efficient burner on the market.

W. S. RAY MANUFACTURING CO.
Manufacturers of Ray Crude Oil Burners
Ray Oil, Gas, Coal or Wood Heavy Steel Ranges

OFFICE AND SALESROOM:
29 Spear St., SAN FRANCISCO
Phone Kearny 199

PLANT AND SERVICE:
Bosworth, Milton and S. P. R. R.
Phone Mission 5022

GENUINE SQUIRES STEAM TRAPS
Great Durability and High Efficiency.
Main joints above water line.
Valve and Seat accessible without breaking joints.
Every Trap unconditionally guaranteed.

W. E. MUSHETR Co
SOLE AGENTS
Phone Sutter 4797
502 Mission Street
San Francisco, Cal.

ARCHITECTS - BUILDERS - CONTRACTORS

MODERN CONDITIONS practically DEMAND gas heating.
Be fore-handed and include provision for the use of GAS HEATING APPLIANCES in your plans and construction program. If an estimate on a complete heating system will help, do not hesitate to call on us.

Pacific Gas and Electric Company

When writing to Advertisers please mention this magazine.
FESS SYSTEM TURBINE FUEL OIL BURNER

"Worthy of your consideration"

We are the originators of the mechanical atomizing type oil burner and the largest exclusive manufacturers of oil burning equipment in the west. All parts of our equipment are manufactured in our own plant, thereby assuring prompt and efficient service at all times.

Specify "FESS SYSTEM"—it has no equal

FESS SYSTEM COMPANY, Inc.
218-220 Natoma St., San Francisco.  Phones Sutter 6927-6928.

Agencies in all principal cities.

Member of the Oil Burners Manufacturers' Association of California.

SIMPLEX BURNERS

For High or Low Pressure Boilers, Water Heaters, Kilns, Dryers, Furnaces, Etc. Operated by Fractional H. P. Motors. Guaranteed for Efficiency and Durability.

BUNTING IRON WORKS

1215 FIRST NATIONAL BANK BLDG.
Factory BERKELEY  SAN FRANCISCO Phone Sutter 3225

Member of the Oil Burners Manufacturers' Association of California.

OIL BURNER EQUIPMENTS

Low Pressure Air and Rotary Mechanical Atomizing Types
Refrigerating and Ice-Making Machines
Direct Expansion and Brine Circulating Systems

T. P. JARVIS MANUFACTURING CO.
CONTRACTING ENGINEERS AND MANUFACTURERS
275 Connecticut Street, San Francisco  Phone Market 3397

Member of the Oil Burners Manufacturers' Association of California.

JOHNSON'S ROTARY CRUDE OIL BURNER

Can be installed in any BOILER or FURNACE
Gives Satisfactory Results. Simple to Operate—Automatic—Safe. Let us tell you more about this Oil Burner.

S. T. JOHNSON CO.
1337 Mission Street - San Francisco, Cal.
Ask for Bulletin No. 28  Phone Market 2759

Agencies: SEATTLE  LOS ANGELES  FRESNO  SAN DIEGO  SACRAMENTO
Member of the Oil Burners Manufacturers' Association of California.

When writing to Advertisers please mention this magazine.
Pump Governors
Oil Burner Governors
Reducing Valves
Safety Valves
Oil Valves
Blowoff Valves
Boiler Feed Water
Regulators

Oil Pumping Sets
Little Giant Improved
Oil Burners
Duplex Oil Pumps
Rotary Oil Pumps
Oil Heaters
Draft Gauges
Boiler Feed Pumps

G. E. WITT CO., Inc.
ENGINEERS
Manufacturers and Distributors
862-864 HOWARD ST. Phone Douglas 4404 SAN FRANCISCO, CAL.

STANFORD STADIUM
CABOT'S NO. 305 GREEN CREOSOTE SHINGLE STAIN
was used exclusively for staining all fences, stairs, steps, scoreboard, etc.

PACIFIC MATERIALS CO.
525 MARKET STREET
SAN FRANCISCO

AMERICAN MARBLE & MOSAIC CO.
25-59 Columbia Square, San Francisco, Calif.
Near Folsom St., Bet. 6th and 7th Sts.
Factory on Waterfront, South San Francisco. Phone South San Francisco 161

DETROIT STEEL PRODUCTS CO., Detroit
Direct Factory Branch, 68 Post Street, San Francisco Phone Sutter 1250

When writing to Advertisers please mention this magazine.
THE ARCHITECT AND ENGINEER

CONTENTS FOR JANUARY, 1922

Flintridge Country Club, Flintridge, near Pasadena

Frontispiece

Myron Hunt, Architect

Ancient California Architecture

Irving E. Morrow

Portfolio of Recent Buildings Designed by Glenn Allen, Architect

Lack of Uniformity of Load Requirements in Building Codes

Richard G. Kimbell

Queer Scaffold Used by Japanese Builders

Concrete Test Highway at Pittsburg

Plan to STANDARDize Construction Contracts

Giving Expression to Modern Architecture

Walter W. Cook

The Architect and the Structural Engineer

Shower Bathing in the Home

Arthur J. Phillips

Editorial

With the Architects

With the Engineers

The Contractor

Published Monthly by

The Architect and Engineer, Inc.
626-27 Foxcroft Building, San Francisco

W. J. L. Kierulff Frederick W. Jones L. B. Penhorwood
President Vice-President Secretary
FLINTRIDGE COUNTRY CLUB, FLINTRIDGE, NEAR PASADENA, CAL.  MYRON HUNT, ARCHITECT
Ancient California Architecture

By IRVING F. MORROW

The following article is reprinted from the Pekin "Journal of Archaeology" of April 1, 1922, by special pre-arrangement with the editors:

Recent archaeological discoveries on the coast of California have aroused renewed interest in the architecture of the ancient civilization of North America. Readers of these columns have already been informed from time to time in regard to the extraordinary results of Prof. Chang's explorations and excavations. Every new discovery has introduced fresh perplexities into the carefully formulated theories of American life and art. In fact, Prof. Lin Tow has contended that future effort should be diverted from disconcerting investigation on the ground, and concentrated upon the analysis and interpretation of the data in our possession.

As is well known, Prof. Chang's attention has for some time past been occupied with those structures anciently known as "Missions," which were built along the coast of California around the nineteenth or twentieth century. Considerable uncertainty surrounds these buildings, but the names attached to them have led to the conclusion that they were founded by Christian missionaries from the Mediterranean countries of Europe for the purpose of civilizing the early Americans, who are known to have had an unusually material and industrial culture. The connection between European and American civilizations has never been completely understood. Although the names, locations, and aspects of these "Missions" have been reconstructed with considerable definiteness, no trace of the actual buildings seemed to have survived. Prof. Chang's most recent achievement is no less than the discovery of the first actual remains, which have been identified by a comparison of ancient illustrations as Mission La Purisima Concepcion.

The long-standing controversy between Dr. Wan and Prof. Chang touching the location of this building thus comes to an end. It will be remembered that the former authority, relying upon an exhaustive investigation of the available references in contemporary literature, has held that the site was in the Santa Ynez Valley, above the ancient town of Santa Barbara. The latter, on the other hand, after a careful study of fragmentary magazine illustrations in a precarious state of preservation, has maintained that it was nearer the general vicinity of Los Angeles. The recent investigations at Flintridge, near Pasadena, completely vindicate Prof. Chang's position.
But if this discovery closes the mooted question of location, it opens others of a much broader bearing on early Californian civilization. Many investigators have commented on the anomaly that, although ancient literature is full of appreciations of these so-called Mission buildings, all traces of the structures themselves have disappeared as completely as the legendary Sequoia Gigantea and Monterey cypress. It has seemed unreasonable that buildings held in such esteem should have been allowed completely to disintegrate, or that any accident should have wiped out the whole line, scattered over an extended territory. Some authorities have assumed that a natural cataclysm must have produced extensive geographical changes. Certain it is that some such changes have occurred. Read, for instance, the remains of the early commercial literature of Los Angeles relative to the city’s port, and compare with the present relation of the harbor to the city site. But just how such geographical changes would have affected the Mission structures without touching other buildings remains unexplained. Prof. Lin Tow holds that the situation unmistakably indicates a Japanese invasion of the Pacific Coast of North America, during which the Americans undoubtedly used these buildings as points of military vantage, leading to their complete demolition by the Japanese. Basing himself on these propo-
sitions, which can not be controverted. Prof. Lin Tow is at present engaged on
a history of the Japanese-American War, which undoubtedly must have been of
great significance if it occurred. At any rate, there remains for explanation
the curious fact that while all of the other buildings have completely disappeared,
the structure of the present one remains intact except for the roofs, which an-
cient illustrations indicate to have been of wood. Certain ancient references
allude to the buildings as “adobes,” but Prof. Chang points out that this ob-
viously originated as a natural printer’s error for “abode,” which is an ancient

LOGGIA, FLINTRIDGE COUNTRY CLUB, FLINTRIDGE, NEAR PASADENA, CAL.
Myron Hunt, Architect

English word signifying “dwelling-place,” the Missions having been of a mon-
astery type, and that it can not be held to apply to the material of construction.
The present building is of a hard, dense concrete, which has admirably with-
stood time and neglect, making it seem that the disappearance of the others
must have been deliberate. Another curious circumstance is that the walls
are double, with an open space between. Prof. Chang thinks that this was
a natural device for maintaining a uniform temperature in the interior; but
Prof. Lin Tow is of the opinion that it probably had some military signifi-
cance, and that its use accounts for the destruction of the other Missions in
the Japanese invasion.
The layout of the building raises other serious questions. Considered abstractly as architecture, the plan is admirable, although it conforms in almost no respect to the known Mission requirements. Prof. Chang has suggested that the building was really entirely secular in character; and, relying again on allusions in badly preserved architectural journals of the period, intimates that it may have belonged to that class known to the early Americans as the "Country Club." However completely a consideration of the plan seems to bear him out, the suggestion really appears on its face rather preposterous, because these buildings rarely had any observable architectural relation to the country, while the building under discussion not only belongs unmistakably in the open country, but to the particular country where it stands.

In fact, passing over for the moment controversies as to construction and purpose and looking at the building as an artistic achievement, its design is of the greatest interest. If, as Prof. Chang suggests, it is indeed a "Country Club," it is one of the most admirable and appropriate ones which has come to light. To carry the elimination of unessentials to such a degree and at the same time invest the unadorned essentials with never-failing interest and charm requires the sure touch of the real designer. Pro-
portions are distinguished and scale satisfying. The intimate harmony of a building of such poise in a landscape of this self-denying character is more impressive than all the impertinent elaboration that could be conceived and paid for.

It is another strange fact in connection with this building that it is the only one of the ancient "Missions" the name of whose architect has been preserved. Contemporary references credit the building to a Myron Hunt, who seems to have been one of the most versatile designers of the period.

In fact, the variety of work attributed to his name makes it plain that he could not have been one of the so-called "Mission Fathers"; unless, indeed, we assume that the name is only a symbol around which tradition has deposited a continuous accretion of anonymous fragments, much after the fashion of the poetical Homer of extreme antiquity, and the musical Wagner of about the nineteenth century. However, students of early Californian art are generally agreed that the name of Myron Hunt represents a real individual, and that he was one of the founders of the movement which bore such notable fruit in the architecture of the great period of California in the twenty-first century. This building certainly deserves its place in that tradition. Prof. Chang is to be congratulated.
PRELIMINARY SKETCHES, FLINTRIDGE COUNTRY CLUB, FLINTRIDGE, NEAR PASADENA, CAL.

MYRON HUNT, ARCHITECT
FLINTRIDGE COUNTRY CLUB, FLINTRIDGE, NEAR PASADENA, CAL. MYRON HUNT, ARCHITECT
PRESENT DINING ROOM, FLINTRIDGE COUNTRY CLUB, FLINTRIDGE, NEAR PASADENA, CAL.
MYRON HUNT, ARCHITECT
Portfolio of

Some Recent Buildings

designed by

Glenn Allen, Architect

of Stockton

Photographs and drawings of these buildings will be shown in connection with an Architectural Exhibition to be held under the auspices of the Stockton Association of Architects, January 21-28, 1922.
WAREHOUSE FOR MR. H. S. DAWSON, STOCKTON

Glen Allen, Architect
HOUSE FOR MR. EMIL GINGG, FOREST HILL, SAN FRANCISCO. GLENN ALLEN, ARCHITECT.
STOCKTON MUNICIPAL MINERAL BATHS
Glenn Allen, Architect

VIEW OF POOL, STOCKTON MINERAL BATHS
Glenn Allen, Architect
TOWER, STOCKTON MINERAL BATHS
Glenn Allen, Architect

ENTRANCE, RESIDENCE IN CROCKER HIGHLANDS, OAKLAND
Glenn Allen, Architect
HOTEL CLARK GARAGE, STOCKTON
Glenn Allen, Architect

STAIRCASE, RESIDENCE IN CROCKER HIGHLANDS, OAKLAND
Glenn Allen, Architect
Lack of Uniformity of Load Requirements in Building Codes

*By RICHARD G. KIMBELL

(The Second of a Series of Articles on Building Codes.)

A PREVIOUS article cited the fact that of fourteen hundred and seventy-eight (1478) cities of over five thousand (5000) population in the United States, only four hundred and ten (410), or 27% of them, so far as has been determined, have a building code.

By persistent effort, a library of the codes of some three hundred cities has been accumulated. A careful study of them reveals some decidedly interesting and significant facts. This article will discuss only the live load requirements in the various codes. As the codes of cities located in close proximity to a larger city generally have similar requirements to those of the larger city, a group of sixty-five widely scattered cities of over twenty-five thousand population was taken as being representative and their codes examined to determine if the suspicion of a wide variation was founded on fact or surmise.

An effort was made to place the various loading assumptions under the headings found in these sixty-five codes. That effort brought out the first of the variations of this topic, there being so many divisions or groupings and so different as to make this impossible. Therefore, a group of occupancies believed to be representative was chosen and the load requirements tabulated thereunder. This, of course, meant the omitting of some of the requirements that were minor divisions under one group heading, and others that were separate and distinct. One code in addition to providing load assumptions for the various portions of different buildings, went even further and gave loads for the assembly halls of theaters, schools, hospitals, dance halls, hotels, etc., which were at variance with the loads under the other headings for the same buildings.

Possibly the most interesting of the variations brought out in this tabulation, and one of greatest significance to our home owners and builders, referred to dwelling loads. These range from 30 to 80 pounds per square foot for the first floor, 30 to 50 pounds per square foot for the second floor and 20 to 40 pounds for the attic. Is there rhyme or reason in this? Is a dwelling in City A liable to greater loads than one in City B? Generally the spans of joists are limited by deflection to prevent plaster cracking. On that basis a 2 x 10 will carry a 30 pound load over a 16' 3" span while the same timber will carry an 80 pound load for only 13' 0". Thus poor Jones in City A, where they require dwelling house floors constructed to accommodate a live load of 80 pounds per square foot must use a 2" x 12" joist for a 15.8 ft. span, while Brown in City B, who has only to provide for a 30 lb. load, uses a 26" x 10" joist for a span 7" greater than Jones, with less lumber for each of his floor supporting members than Jones used. Is this fair or justifiable? Is there sense in requiring Jones to buy more material for the same purpose than Brown, making his building cost more, causing an investment on which he will never secure a return? If the 30 lb. load requirement is safe, what a great economic waste and needless hardship is caused by an 80 lb. requirement. If, however, a floor built to accommodate 80 lbs. per square ft. is the absolute minimum for safety and stability, this man Brown who builds to accommodate only 30 lbs. has erected a house of cards and created a hazard to the occupants of his building.

The following is a summary in tabular form of the occupancies and the ranges of the live loads for the sixty-five (65) cities:

<table>
<thead>
<tr>
<th>Occupancy</th>
<th>Location</th>
<th>Range of loads in lbs. per square ft.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dwellings</td>
<td>1st floor</td>
<td>30-80</td>
</tr>
<tr>
<td></td>
<td>2nd floor</td>
<td>30-50</td>
</tr>
<tr>
<td></td>
<td>Attic</td>
<td>20-40</td>
</tr>
<tr>
<td>Tenements and apartments</td>
<td>1st floor</td>
<td>30-80</td>
</tr>
<tr>
<td></td>
<td>Above</td>
<td>30-50</td>
</tr>
<tr>
<td>Store—light merchandise</td>
<td>1st floor</td>
<td>75-150</td>
</tr>
<tr>
<td></td>
<td>Above</td>
<td>100-125</td>
</tr>
<tr>
<td>Stores—heavy merchandise</td>
<td>1st floor</td>
<td>120-250</td>
</tr>
<tr>
<td></td>
<td>Above</td>
<td>200</td>
</tr>
<tr>
<td>Warehouses</td>
<td>Heavy</td>
<td>150-250</td>
</tr>
<tr>
<td></td>
<td>Light</td>
<td>100-150</td>
</tr>
<tr>
<td>Factories</td>
<td>Heavy</td>
<td>150-250</td>
</tr>
<tr>
<td></td>
<td>Light</td>
<td>100-150</td>
</tr>
<tr>
<td>Roofs</td>
<td>Pitch 20° or less</td>
<td>20-50</td>
</tr>
<tr>
<td></td>
<td>Pitch of more than 20°</td>
<td>15-50</td>
</tr>
<tr>
<td>Assembly halls, theatres...</td>
<td>Movable seats</td>
<td>80-125</td>
</tr>
<tr>
<td></td>
<td>Fixed seats</td>
<td>50-125</td>
</tr>
<tr>
<td></td>
<td>Drill</td>
<td>100-250</td>
</tr>
<tr>
<td></td>
<td>Dances</td>
<td>100-200</td>
</tr>
<tr>
<td></td>
<td>Rooms</td>
<td>40-120</td>
</tr>
<tr>
<td>Schools</td>
<td>Corridors</td>
<td>60-125</td>
</tr>
<tr>
<td></td>
<td>Assembly</td>
<td>75-125</td>
</tr>
<tr>
<td></td>
<td></td>
<td>40-100</td>
</tr>
<tr>
<td>Office buildings</td>
<td></td>
<td>50-150</td>
</tr>
<tr>
<td>Public buildings</td>
<td></td>
<td>50-150</td>
</tr>
<tr>
<td>Stairways and fire escapes...</td>
<td>General</td>
<td>60-125</td>
</tr>
<tr>
<td></td>
<td>Assembly</td>
<td>100-125</td>
</tr>
<tr>
<td>Garages</td>
<td>Public</td>
<td>70-175</td>
</tr>
<tr>
<td></td>
<td>Private</td>
<td>40-125</td>
</tr>
<tr>
<td>Grandstands</td>
<td>Rooms</td>
<td>30-75</td>
</tr>
<tr>
<td></td>
<td></td>
<td>50-125</td>
</tr>
<tr>
<td>Hotels</td>
<td></td>
<td>30-100</td>
</tr>
<tr>
<td>Hospitals</td>
<td></td>
<td>30-100</td>
</tr>
<tr>
<td>Sidewalks</td>
<td></td>
<td>150-500</td>
</tr>
</tbody>
</table>

The loads for roofs having a pitch of more than 20 degrees from the horizontal, vary from 15 lbs. to 50 lbs. per square foot. “Oh yes,” someone remarks, “that variation is accounted for by the fact that a city with a 50 lb. load provides for a snow load in addition to the other loads, while the city with a 15 lb. load is probably in the southern part of the country, where they have no snow loads.” That would seem logical, but is, however, not borne out by the facts. Although southern cities as a rule have lower roof load requirements than the northern cities, this does not hold true in all cases. One city with a 15 lb. load is within two hundred miles of a city with a 50 lb. load, and both are in the northern New England States. Indeed, the 15 lb. load city is about one hundred and fifty miles north of the city having the greater load. Roof loads should undoubtedly vary according to climatic conditions, but the particular instance cited shows clearly that, in many cases, they are not within reason. Such variations in cities where conditions are similar proves the majority of our building laws are based neither on logic nor judgment.

Further, what of the variations of from 30% to 100% for industrial buildings? And what about the great variance in the quantity of materials required in this type of structure? This question, however, hardly needs discussion, as a practical engineer will readily realize the loss, waste and inconvenience of such different standards, and when brought to his attention will generally make an effort to right the wrong. With the prevailing ordinances should his practice be wide and diversified, and dis-
distributed over a considerable territory, he must have in his possession the building laws of all the cities where he erects structures to be able to meet the local requirements in his designing.

Furthermore, such variations prohibit and prevent standardization in the design of various structural units otherwise entirely possible.

The opinion is held by some that where the requirements as to floor loads are low, the allowable unit stresses for structural materials are correspondingly low, and where the live loads are high, the attending stress values are also high—thus in a way balancing the variations so that approximately the same amount of material would be used in both localities for a building of the same character. This, however, is not true in the majority of cases. A city with high load requirements may have the same allowable unit stress for materials as a city with low loads, and vice versa. This has been verified by our examination of the some three hundred codes in our library. The variations in the allowable stresses and their effects will be presented in a subsequent article.

* * *

New Orleans Skyscraper 147 Years Old; Still Stands

The following story of New Orleans' first skyscraper from the Times-Picayune is an interesting account of some of the earliest construction work done in the skyscraper field:

"'Towering high above the city, the skeleton frame of the new Hibernia Bank building rears its cupola, twenty-three stories in the air. Below, the masons already are at work placing in position the great blocks and graceful arches that will form the outer walls of the structure. It is the highest building ever erected in New Orleans.

'And within sight of the towering cupola, nestled in a strange huddle of dwellings, far down the Rue Royale, the first skyscraper of old, old New Orleans still stands.

'Stripped of all its old time grandeur with its queer narrow hallway and still narrower stairway it stands a venerable reminder of those other days, when, in its brave finery of hand wrought grills and slender gallery railings, the first skyscraper caused fashionable Nouvelle Orleans to gasp in wonder.

'It was in those brave old days of Spanish occupation, three years before the minute men of Lexington had fired the first muskets in the struggle to make the colonies free, that the first 'towering landmark' was built.

'Tradition still tells of the horrors experienced by those old Creole fashionables when the new owner of that little tract of land on the Rue Royale, at the corner of what is now St. Peter street, told his neighbors that he was about to build the 'mammoth' four-story-and-a-half scraper.' And of the vigorous protests that were made in the old Cabildo, the structure in which Don Alejandro O'Reilly ruled, perhaps to the doughty Irish-Spanish leader in person, against that soaring structure by those who feared that such a spindling, mountainous plinth would topple into the streets if, perchance, the winds blew briskly.

'But, if Don O'Reilly heard these pleas, he was busied with other affairs in those days of 1774. The building shot skyward. Nor were the fears of those old Creoles realized. It still stands today, despite the fire that swept its neighbors to the south, destroying even the Cabildo, in 1780, together with the records that should give the history of its construction.

'But now evil days have come to the old building, and now, while its splendid neighbor soars skyward, its status is that of a tenement.'
Building in Japan

An eight-story structure of wood, the first ever attempted. The staging is like that for a one-story hut.

No nails are used and the timbers are mere splinters.
Photo by "International"

QUEER SCAFFOLD USED BY JAPANESE BUILDERS

This scaffold is used in many parts of Japan by house builders. It consists of long poles lashed together with heavy thongs, and erected in a square around the building site.

Present Day Progress in Home Decoration

More progress has been made in home decoration during the last ten years than in any of the other arts and crafts. In most homes today, gloomy reminders of bad periods have been relegated to the attic or the furnace and the modern home reflects the learning and culture of its owner. Not so the home of 1861 or 1910. The home lover was forced to make her selection from a very restricted number of good designs. Today she has all the designs which have ever been produced to select from and each season brings a number of newer ones.

* * *

Ants Destroy Wooden Poles

According to Mr. R. J. C. Wood white ants have been attacking the untreated poles of the Southern California Edison Company at various points south of the Tehachapi. Boring into the pole below the surface of the ground the ants honeycomb the wood leaving only a thin shell on the outside. First evidence of the destruction caused by the ants is revealed when the pole is blown down or an attempt made to move it.

* * *

Aviating Fish

"What are the screens on the windows for? You told me there are no mosquitoes here," said the suspicious purchaser of a lakeside bungalow. "Why—er—ta keep out the flying fish," said the agent.—Exchange.
OBSERVATION TUNNEL BUILT UNDER TEST HIGHWAY

SHOWING LOCATION OF OBSERVATION TUNNEL IN RELATION TO CONCRETE SLAB
Concrete Test Highway at Pittsburg

The greatest, and one of the most important, highway tests ever undertaken in America is now being conducted at Pittsburg, Contra Costa County, California, and probably will be concluded during the current month, as the road is fast giving way. Forty government motor trucks are being driven around a concrete test highway, one-quarter mile in length, 18 feet in width, and built in the form of a racetrack. The trucks will continue to be driven around the track until the test highway is totally destroyed. Complete checks of results at all stages are being made, so that at the conclusion of the test the results will be available in practical form and used to advantage in determining what types of concrete construction are best adapted to California soil conditions.

Many observations are being made on the test highway which were never attempted before.

Four tunnels were built beneath the pavement for the purpose of taking observations on the underside of the slabs, to determine the effect of various truck loads and speeds on the flexure of the slabs, as well as on the subgrade.

Self-recording instruments are being used in each tunnel, which indicate directly the flexure caused by loads on top of the pavement. Embedded in the concrete slab and extending down into the tunnel are a number of rods. To the end of each rod is attached a recording pen. As the motor trucks pass over the pavement directly over the tunnel the flexure will be recorded on the reading sheet, which is driven by an electric motor.

The soil deflection rods are provided with a plate at one end which rests directly under the concrete slab and shown at B.B. These rods will be equipped with veriniers for the purpose of observing the deflection of the subgrade as the motor trucks pass over the pavement.

Forty motor trucks are now operating over the test highway, twenty going in each direction.

The reading sheets will be filed daily, which will give a perfect record of slab and subgrade deflection throughout the entire test.

It is believed that these under-slab tests will be of great service to all road builders, as it is the first time that it has been possible to make observations from the under side of the pavement.
MODEL OF TEST HIGHWAY

The man is holding two pieces of reinforcing steel of 70,000 lbs. tensile strength. Several sections of the track are reinforced with this steel.

VIEW OF TUNNEL, SHOWING THE RECORDING PEN AND RECORD SHEET
On each side of the test highway there is a ditch, and it is so arranged that water can be turned into the ditches and raised to the height of the top of the subgrade. This will make it possible to study the moisture effects on the subgrade. Holes have been provided in the concrete pavement, which have been filled up with wooden plugs. These plugs will be removed and borings will be taken in the subgrade when the latter is perfectly dry. The borings will then be replaced and tamped, and the water turned into the ditches, after which boring will again be taken to determine the rate of percolation. From the observations taken in the tunnels the relationship between the moisture content of the subgrade and its bearing power under traffic will be learned.

The extensometer will also be used to measure these loads from the under side of the reinforced slabs—the first time that this has ever been done. Readings will also be taken with this instrument on top of all slabs. A forked extension has been devised in using the extensometer in measuring the loads from the bottom of the reinforced slab. Two steel points will be screwed into the end of the extension. These points will fit into holes drilled in the under side of the reinforcing rods directly over the top of the tunnel. The extensometer will be attached to the lower end of the extension, which will enable observation of the extensometer from the tunnel proper. Without the extension it would be very difficult, if not impossible, to use the extensometer in measuring loads from the bottom of the reinforced slabs.

The surface of the test highway has been marked off into six-foot squares, which are numbered and lettered in such a manner that a progress record will be made of all cracks. As a crack appears in any section of the test highway it will be recorded on a chart, and when the test is completed the chart will show the location of every crack, and when and how it occurred. All cracks appearing during the first month of the test will be
marked on the chart in brown, those for the second month in green, and so on.

A novel feature in connection with this test highway is the fact that it is built in the form of a racetrack, a general view of which is shown. The road is 18 feet wide and 1,371 feet in length on the center line and comprises thirteen sections of concrete pavement of various types—both plain and reinforced.

A set of scales of 50 tons capacity has been provided for weighing the various trucks that are taking part in the test. In order that the tests may be carried out at night a powerful floodlight has been erected on the roof of the office. This completely illuminates the entire test highway, enabling a newspaper to be read at the far end of the track.

Before starting the building of this test highway questionnaires were sent to the highway engineers of the state, asking for their views as to what should be included in the test, or any other suggestions. State and federal engineers were also consulted with the same object in view. The hearty cooperation of all was freely given, with the result that thirteen types were selected as conforming nearest to all the views given. One section typifies the construction recently adopted and now being used by the State Highway Commission.

On December 21, 1921, the side ditches of the highway were flooded and samples of the subgrade were taken on December 30. It is evident that the original subgrade was so compact that it is practically impervious to water, and it is not thought that it will become saturated except through the medium of suction under the slab created on the pavement.

Very recently more than 200 delegates representing the Boards of Supervisors of many of the state's counties, county engineers and automobile interests, gathered at the Pittsburg track to observe the manner in which the highway is standing up. A number of these officials expressed themselves as surprised at the manner in which the different sections are holding out.

The project originated in the mind of Mr. Jno. B. Leonard, M. Am. Soc. C. E., who was also responsible for the observation tunnels and the special instruments installed therein. Mr. Lloyd Aldrich, consulting highway engineer, is associated with Mr. Leonard in these highway tests, which are made possible by the hearty cooperation of the following, who have contributed material, machinery, instruments, services, and money:

Automobile Club of Southern California; Bates & Borland, general contractors; Blake Bros. Co., crushed rock; Edward R. Bacon Co., contractors' equipment; California Highway Commission; Columbia Steel Company; California Corrugated Culvert Company; Coast Rock and Gravel Co.; Ralph M. Heintz, makers of scientific instruments; R. E. Noble & Co., inspecting engineers; Old Mission Portland Cement Co.; The Frederick Post Co., engineering and surveying instruments; H. H. Robertson Co., Robertson's process cement fibre; Smith-Booth-Usher Co., contractor's equipment; Smith-Emery & Co., inspecting engineers; Stuart S. Smith & Co., machinery merchants; Spears-Wells Machinery Co., contractors' equipment; Taylor Instrument Co., thermometers, etc.; United States Bureau of Public Roads; Yuba River Sand Co.; California State Automobile Association; city engineer's office, San Francisco.
Plan to Standardize Construction Contracts

The standardization of construction contracts, towards which all farsighted men in the industry have been looking for the last twenty years, seems destined to be achieved at last, through the united efforts of a conference held in Washington, D. C., recently.

This conference was composed of delegates appointed by eight national societies representing the engineers, architects and contractors of the United States, and the definite plan adopted was one which would ultimately produce a standard form of contract "agreement" which would be acceptable in all sections of the country and in all phases of this huge industry, which now ranks second only to agriculture in national magnitude.

Every constructor and owner who has wrestled with the intricacies of a contract, or worried over the exact yet doubtful meaning of its many complicated and legalized phrases, will approve this first attempt to frame in simple Anglo-Saxon words an equitable and universal document.

A survey of the situation made several months ago by Brigadier-General R. C. Marshall, Jr., formerly Chief of the Construction Division, U. S. Army, during the world war, disclosed the fact that today there are in common use throughout the construction industry, over 200 different forms of contract, and that no one state or section had yet been able to establish any one form as standard or customary.

Expert engineers at the headquarters of the Associated General Contractors of America, in Washington, were then assigned to the task of analyzing these 200 different forms in order to discover whether the variety of "jobs" involved required any such variety of forms.

After many months of painstaking comparison and research, Mr. W. P. Christie, in charge of this work as research engineer for the Associated General Contractors, reported that the differences were chiefly superficial differences of words and phrasing, rather than differences of meaning or stipulations, and that at least two-thirds of all the provisions contained in each of the 200 documents were common to all documents, and therefore could be included in one standard contract form, if rewritten in simple universal style.

It was found that stipulations which were characteristic or peculiar to the building trades, or to the railroad construction field, or to water work projects, or to highways could be assembled together in one standard form, entitled "general conditions," applicable to that one field of construction only, and added to the standard agreement form as addenda.

In this way, it would be quite possible to draft a standard contract which would cover all cases of construction work, no matter in what field, and the only alteration that would ever need to be made to it would be in selecting the standard form of "general conditions" which covered the type of job concerned. Experts believed that a half dozen such forms would cover the main subdivisions involved in the construction industry.

This plan, together with a tentative outline, was submitted for consideration to the—

American Association of State Highway Officials.
American Institute of Architects.
American Railway Engineering Association.
American Society of Civil Engineers.
American Waterworks Association.
Associated General Contractors of America.
National Association of Builders Exchanges.
Western Society of Engineers.

All made favorable responses and appointed representatives to come to Washington to constitute a conference on the subject and proceed with the drafting of a tentative form of contract, which could later be officially submitted by the conference to its constituent bodies for criticism, amendments, and ultimate ratification.

The conference met in the assembly room of the Department of Commerce building, in Washington, December 15 and 16, and was addressed by Secretary of Commerce Hoover and General Marshall, both of whom expressed a very lively and sincere hope that the conference would ultimately devise a form which would become as standard in its field as the standard forms of bank checks, notes and mortgages are in the field of banking and commercial trade.

Secretary of Commerce Hoover said, in opening the conference:

"Well, gentlemen, this conference is to consider whether something can be done to standardize or simplify or reinforce or generally improve the whole basis of contract forms used in the construction industry.

"I believe there is a great field there, not only in protection to the public, but in the general improvement of ethics in the industry itself. I don't profess to know much about it, but it is a matter that has not come under my purview for some years. I have been too much out of the engineering work for the last seven years to give much thought to it.

"I know that the time I was in engineering work this whole variation and specification of the contract basis for construction work of all kinds was an outstanding sore, and I have been in hopes that it was possible to do something. It all comes in line with the things many of us are much concerned with, and that is fundamentally the elimination of waste, lost motion, improvement of business practices throughout the whole of the United States.

"We have to remember that we have now an enlarged and inflated cost of distribution primarily, rather than production, and that we have a disparity due to the fundamentals of the increase in federal taxation and railway rates that are making a wider margin between production and final distribution costs than we have ever had to face before, and unless we can crowd that margin down somewhat by just sheer increase in efficiency, we are not going to be able to hold up the standard of living in this country and hold up our competitive position outside. So this is one of those things that ramify in many directions.

"I now, therefore, leave it to you, and we are glad to have you come to this department, because we have started a definite program along all these lines, not from a point of view of trying to compel anybody to do anything, but trying to mobilize all the different branches of industry for cooperative action, and while you can do much to get this thing straightened out it is probable that the Department of Commerce could be of moral assistance to you in getting it over when you have once arrived at some conclusion, and we will be delighted to back up anything that you come to an agreement on, and I have been astonished at the desire of the different industries to effect these things in very direction and their willingness to cooperate with other industries to make the work of each individual industry effective.
"We had the case the other day of the simplification of certain manufactured articles. The great majority of the manufacturers were represented here, but claimed that some minority would not help. They could not do anything without the assistance of other branches, and, therefore, I called in both the wholesalers and retailers in those directions and asked them if they would cooperate, and they have cooperated so far as to almost set up a boycott against certain manufacturers because they would not fall into line with the great majority, and they did it purely out of national interest.

"Somebody somewhere has got to eliminate the waste in this whole situation. I only mention that as a point where this department can be of help in getting the allegiance of the related industries and trades, and help you to get over some program of this kind.

"So that all I am doing is to give you our blessing and to tell you that the Department of Commerce is yours. Go to it.

"Now it is up to you, I think, and if there is anything in the department by which we can be of help, statistical or otherwise, do not hesitate to call on us."

The aim of the conference in beginning work on this difficult task was to achieve the following advantages for the entire construction industry and all its affiliations:

(1) Less expenditure and legal service.
(2) Less duplication of work in the professions.
(3) Elimination of disputes.
(4) Better safeguard for owners and increased public confidence.
(5) An improved standard of construction service throughout the country.

*  *  *

Concrete Ship "Faith" Sells for $5,735

During the war a great deal of publicity was given to the building of concrete ships, and predictions were not lacking that these vessels would revolutionize the ship-building art. Perhaps the most famous of these new vessels was the steamship "Faith," of 3,427 tons gross. It is estimated that this cost about $750,000 to build in 1918. In order to satisfy various claims, the "Faith" has just been sold at auction for $5,735. This represents some little depreciation in three years, after the hundreds of columns of publicity showing the astounding merits of concrete ships.—Stone.

*  *  *

Now Comes the "Glass Plumber"

The introduction of the vacuum-tube light has brought into existence the new trade of "glass plumbing." The glass tubes, in which the light is produced by an electric current flowing through a gaseous conductor, are an inch and three-quarters in diameter, and are put up in length of about 8\frac{1}{4} feet, and hermetically sealed in place. For the purpose of this work a set of glass-blowers' instruments has been invented, including cutting tools, blowers and hand torches, and experts perform the necessary operations with surprising rapidity.
Giving Expression to Modern Architecture
By WALTER W. COOK, in New Orleans Building Review

ARCHITECTURE has been referred to as "Frozen Music." I think that applies to design and ornamentation. To my mind architecture is more human. I feel that all buildings can be classified somewhat as individuals are. The building which expresses the individual use and arrangement best is the better building.

How can we arrive at that result? None of our buildings do so a hundred per cent. It is only by striving continually to approach perfection that it will ever be accomplished. An architect must not be held personally responsible for inability to do this, as the owner or client must be of the same mind if it is to be done. It is the architect's work to try and bring this about. In this age of commercialism, dollars and cents play such an important part that idealism is apt to be brushed aside—justly so in a great many cases.

The people themselves have been expressed in the architecture of the past and, to my mind, this will always be the case. In a cosmopolitan country like America, it will be a long time before any national style will be developed. Architecture is like a language and it is as difficult to invent new forms and new designs as it is to invent a new word or to force Esperanto on the world.

In brief, the people of any community must be united to produce a lasting or an individual style such as the Greek simplicity, the strong Roman period, Italian renaissance and later French and English renaissance periods.

New materials, such as steel and the modern use of reinforced concrete have developed a new kind of structure, but we continue to clothe these structures with the forms and ornaments of earlier periods.

Architects who best adapt the real work of the past to our modern structures will produce the best results and the forms that are used must express the character and the use of the building to best advantage.

Architects must, to my mind, sit down with the owner and talk dollars and cents at the start and determine what the client is willing to spend for exterior treatment of his building—especially for commercial buildings. At the same sitting, Mr. Architect must set forth the facts which are becoming more evident every day that the proper exterior treatment of any building is worth dollars and cents to a client for advertising value as well as the morale of his business. There is no doubt as to the value of the owner of a good looking, well kept manufacturing plant. The architect must obtain effects with the simplest and most economical of treatments that will best express the use of the building. To illustrate: It would be folly to put a Greek temple front on a power plant.

Excellent results are obtained by the simplest of treatments, combining good proportion with proper scale; but the plan and use of the building comes first and, if this has been studied so that the plant works out to its very best advantage, the elevation will take care of itself and is bound to express, outwardly, that which is going on within.

* * *

Standardization of Glass

Standardization of the different kinds, qualities and sizes of window and plate glass used as a building material and for many other purposes was discussed at a recent conference between glass distributors, architects, and engineers of the bureau of standards of the Department of Commerce.
The Architect and the Structural Engineer

The following is a summary of a paper read at the forty-ninth ordinary general meeting of the Concrete Institute at Westminster, S. W., by Mr. William E. A. Brown, A. R. I A. B., M. C. L.:

An architect is necessarily a structural engineer, with the addition of the artistic sense and skill to clothe the structural forms with beauty of line and contour, and to so arrange mass and void into one harmonious whole, studying the great lessons of the past, and carrying on the architectural traditions of ancient Greece and Rome, down through the Middle Ages, and on through the Renaissance. The architects of such buildings as the Church of Santa Sophia at Constantinople; St. Peter's at Rome; the Pantheon, Rome; the Duomo of Florence; and to come down to more recent time, Sir Christopher Wren's masterpiece in London, and Bentley's last great work of Westminster Cathedral, were structural engineers.

Were not all our cathedrals, which were the delight of artists and lovers of the beautiful, wonderful examples of architects' engineering skill?—majestic buildings with vaulted roofs poised on slender pillars and held in position by flying buttresses, each thrust met by a counter thrust, all combined so as to keep the whole structure in a stable condition.

Structural engineering includes not only steel work used in buildings, but also all forms of construction, whether in brick, stone, timber or concrete, and in designing buildings, and other structures the architect was called upon, not only to exercise his artistic ability, but also as to plan and arrange the various materials to carry, in addition to their own weight, all superimposed loads and external forces, so that the whole might remain perfectly stable.

No doubt the Council of this Institute had this in mind when it was decided to enlarge the scope of the Institute by adding structural engineering, and not to confine itself to one branch only, i.e., concrete and reinforced concrete. The wisdom of this, he thought, was manifest by the large increase in the membership as well as by the greater attendance at the meetings.

It was the architect and the architect alone, who should determine the position of all main girders, stanchions and supports. In many buildings it was impossible to proceed with the design until these positions were determined. In some cases it was the run from north to south or east to west. In others it would be such a feature as a dome; for example, how could Wren have planned St. Paul's, unless he knew before hand how he was going to support that great and glorious crowning feature of his design? That building could not have been erected had Wren simply made a drawing and handed over the structural work to someone else to deal with; or had that course been adopted, the resulting design would have been different to that made by the architect.

There was no doubt that tradesmen and others who did not realize the importance of having a properly qualified professional man to advise them. They were led to believe and fondly imagined that they were saving a large sum in fees, until they found by experience that their folly had cost them more. It was not his intention or wish to belittle in any way the status of the consulting engineer, as he occupied a very important position in the building world. But what he did
wish to emphasize was that it was the architect's duty to determine the position of all girders and supports in the building he designed. He should also be able to make the necessary calculations for the steelwork in, at any rate, the smaller buildings under his control. Architects often did employ consulting engineers to do the calculations for the steelwork—first for lack of time to do so themselves, and often because in some modern buildings, the steelwork was of so complicated a character that it was advisable and necessary to do so; but that did not alter the question of the position of the architect in the matter.

A good deal of stress has been laid upon the question of whether the steelwork should be designed, and quantities taken out by the consulting engineer before being sent to the constructional firms for estimates, or whether these firms should be allowed to do the calculations themselves. For contracts involving a large amount of steel work of a complicated character, the author agreed that a consulting engineer should be appointed by the architect, but there were many smaller works where this was not necessary, nor would the outlay of the building warrant the expense incurred. It was quite satisfactory, given certain conditions, laid down, for the architect to send the drawings to several firms of engineers, and let them make their own calculations and quantities; but to enable the various contractors to estimate on the same basis, the following information must be given to each:

1. Plans of all floors showing the lines of all main girders and the positions of stanchions and columns; also a section or sections and outline elevation must be given.

2. The loads that each floor had to carry and whether live or total loads.

3. Whether British or foreign steel was to be used and whether the L. C. C. regulations under the General Powers Act, 1909, were to be complied with. If not, the stress should be specified that were to be worked to.

4. Whether price was to include for hoisting and fixing; or only for steelwork delivered to site.

5. If it was to be delivered unpainted, painted, or oiled, and if painted with what materials, and that all scales and rust must first be removed.

6. Workmanship, whether connections must be riveted or bolted and if the latter whether ordinary bolts would be allowed.

7. Whether the price was to include 10 per cent profit for the builders or only 2½ per cent cash discount.

The author's practice was to state the latter. There was a diversity of opinion as to whether dead loads and superloads on a floor should be kept separate in making the calculation, or whether a load to include the dead weight of the floor itself, should be taken. The author's practice was to work to the latter, as the calculations were much simpler and the liability of error was materially reduced.

One must, of course, take into consideration the point loads which often occurred from partitions, etc. This was often neglected by competing firms of engineers, but of the concrete partition blocks on the market weighed a considerable amount, and one was often surprised when the weight was calculated out.

Another matter that he sometimes had to argue with the steel contractors was the central loading on girders carrying walls with openings and narrow piers between. Some assumed that the loads were evenly
distributed over the span through the brickwork below window sills. If the sills are very high up, this may be so, but in many cases the sills are only 12 in. or 18 in. above the girder, and in his opinion, the loading over a length of the girder equal to the width of the pier.

In calculating the loads on stanchions, etc., he did not take advantage of the reductions allowed by the 109 Act. He did not think it advisable, as buildings were often loaded to a greater extent than was allowed for. How often has an architect told that the floors will never have to carry more than a certain weight, and on going over the premises, when occupied, he is surprised to find these loads greatly exceeded.

When the various estimates and plans showing the steelwork were received the architect should carefully go through each set, and compare the sections of the girders, etc., and make rough calculations to check the sizes, and ascertain if the allowable stress had been adhered to. It was also necessary to check the depths of the joists in relation to the span, otherwise undue deflection might occur.

After the plans had been gone through, the architect was in a position to determine which estimate he would accept and when giving the general contractor instructions to accept the estimate it was important to state that all dimensions were to be taken from the site, and that the whole of the work was to be carried out to the architect's satisfaction, detail drawings of all parts to be submitted to him for approval.

The steel contractor must take his own dimensions from the site arranging of course with the general foreman which portion of the steel work was to be delivered first, and the order of delivery of the remaining consignments. When the cleared site had been measured with steel tapes and all angles carefully triangulated, it should be possible for engineers to set out and scale off the lengths of the various parts. The connections and workmanship were, in the author's opinion, very important matters to be considered and as far as his experience went, they did not always receive the attention that should be given them. Of what use was it to have a strong joist or stanchion if the cleats under the joist, or the joist under the stanchion were not properly designed, or if the design is correct the connections themselves were badly made. It was a regular practice to use ordinary bolts to take shear, such as the ordinary 3/8-inch bolt in a 13/16-inch hole, the shank being threaded to within 1/4-inch of the head. He has examined connections made in this way, and often out of five bolts in the connection four of them could be taken out with the fingers when the nut was removed. What amount of bearing area did one get on the threaded end of the bolt, supposing that the bolt was bearing on the plates. The bearing surface consists only of a series of knife edges. If bolts must be used in shear, then the holes must be carefully drilled concentric through all the plates without the usual amount of clearance, and bolts with plain shanks long enough to pass right through all of the plates should be driven in. In order to make sure of having no portion of the threaded end bearing on the outer plate a 3/8-inch washer should be placed under the nut.

I am aware that the 1909 Act says that rivets should be used in all cases where reasonably practicable, but there were a very large number of buildings to which this act did not apply. He thought that all steelwork should be designed in accordance with the provisions of the 1909 Act, but that the conditions for bolted work should be amplified in the act, the only requirement now being that the bolt should extend through the nut and the latter be secured so as to avoid risk of becoming loose. Another important point, and one that was not always attended to, was that all holes through two or more thicknesses of metal should exactly coincide.
If they did not coincide, how could the rivets or bolts take a proper bearing and transmit the load from one to the other?

Filler joists in concrete floors should be bolted or cleated at least every third joist to the main beams. He had seen cases in which this was not done, but the fillers simply rested on short cleats on beams connected to stanchions running through three floors next the street, and with no other tie than that afforded by two 3/4-inch bolts at each floor level; the end stanchion, built on the fact of the party wall with only 4 1/2-inch brick casing around it, was not tied in at all. He believed it was becoming a common practice to place the smaller filler joists on a concrete haunching resting on the bottom flange of the main girder and not tied in any way to the girder. In his opinion this method of construction should be condemned. The area of the stanchion base should be checked to see if the concrete was not loaded more than 12 tons to the square foot. Large gusset plates should not be allowed unless properly stiffened to prevent buckling. It was a good practice to encase the whole of the stanchion base right up to the floor line with concrete. This prevented rusting, and also held the floor of the stanchions. There was no difficulty in bedding both the template and stanchion and if the latter had to be grouted in the stone it might as well be absent. Girders supporting walls as well as main floor girders if they are formed of two or more plain I-beams side by side should have plates riveted on top and bottom. To simply bolt them together is, in his opinion, not sufficient, as the load from the main floor girders was not transferred to the outer joists, through some engineers think it is.

Caution must be observed in casting girders and stanchions with patent plasters, especially those that are stated to adhere without the intervention of any lathing. He had one in mind that corroded the steel to an alarming extent in a short time.

Stanchions and girders are best encased with fine Portland cement concrete, the steelwork having 3/8-inch wire wound round same, space about 12 inches apart. This held the concrete firmly in position and it was not easily damaged even by motors.

When he told them that he had seen specialist firms' own men sawing up timber for centering and the sawdust and shavings and small pieces of wood all left and mixed up with the concrete, he thought one's faith in trusting to such people was rudely shaken. One required a good clerk of words, well up in reinforced concrete construction, with several smart assistants under him, to look after the work.

In calculating the sizes of steel joists embedded in concrete the author's practice was to let the steel carry the load as an independent beam, but taking the depth of the beam anything up to 1-36 of the span, limiting the stress to 7 1/2 tons per square inch. This was quite enough, and he often found that these small joists, such as 3 inches by 1 1/2 inches and 4 3/4 inches by 1 3/4 inches were of foreign make.

He had also had a preference for joists with 3-inch flanges over those with 1 1/2-inch and 1 3/4-inch flange for the reason that the concrete had a much better bearing on the joist. He then uttered a warning against using breeze for floors. There was a great danger of expansion and he knew of several cases where this had occurred and pushed walls several inches out of upright, and even when the wall was rebuilt it happened again. There was also a corrosive action between the concrete and steel which in time might endanger the stability of the floor. The modern architect had to be a man of many parts, a jack-of-all-trades—a bricklayer, mason, carpenter, joiner, plumber and painter—always an artist, often a lawyer and last, but not least, a structural engineer.
Shower Bathing in the Home *
By ARTHUR J. PHILLIPS

Within the last thirty years shower bathing has grown remarkably in popular favor. Even in most moderate cost homes sanitary plumbing equipment is now not considered complete unless a modern shower bath is part of the sanitary installation. This progress is due in a certain measure to the popularity of tiled-in baths and the fact that such a bath makes an ideal receptor for the shower built into the wall above it. The demand for showers, however, is not wholly due to the construction features of the tiled-in bath, as important as that is. There is a more potent reason for the popularity of this form of bathing.

The shower bather has instinctively felt the physical and mental benefits derived from shower bathing, and that is the primary reason why makers of shower baths are increasing their output each year to meet the growing demand for showers. There is another reason recognized as important in shower bathing. It is quick and especially cleanly. Each drop of water fulfills its cleansing function and is gone. Furthermore, the morning bath

can be taken under a shower in the shortest possible time; in fact, while a bathtub may be filling the shower bather will have accomplished his "matutinal ablutions," as our English cousin terms his morning bath.

It must not be conceded, however, that the shower bath will ever displace the bathtub. The two forms will be indispensable in the home. The soothing effects of a hot tubbing has become too engrained in the bather's mind for him to relinquish the therapeutic pleasure of the tub. Furthermore, some persons are so constituted physically that shower bathing would be detrimental to their physical well being, rather than otherwise.

For the person in normal health, however, shower bathing possesses distinct advantages. It provokes thermic and mechanical stimulation of the nerves, blood vessels and muscles, stimulating the circulation and skin, and producing physical and mental refreshment from this physiological action. Some interesting tests have been made relative to the effect of shower baths on energy. Two Italian scientists, Vinaj and Maggiora, observed that the power of the middle finger of one of their subjects to raise a small weight was trebled after a bath reducing gradually from cool to cold. They observed the lowering of muscular capacity after a tepid or warm bath, but a slight increase in strength after a hot bath with friction as in a strong
For muscular soreness there is no better remedy than a hot shower bath in which the soreness vanishes as if by magic.

In designing showers the best makers have kept pace with the latest discoveries in science and to induce the physical stimulation and nervous reaction so beneficial to the bather recommend certain types of showers as best suited for such requirements. The needle bath and overhead shower is highly in favor as a most satisfactory design. A decided preference has been displayed for rose spray needle baths, as shown in the first illustration. These sprays range from shoulder height to knee height and the top row installed with adjustable ball joints so the spray is deflected downward from the shoulder.

Where space and other building conditions permit the tiled shower enclosure with a plate glass door and Regal porcelain receptor makes an ideal installation. The door and receptor are so designed that every drop of water is kept within the enclosure, and no stray or random drops can get outside to dampen or wet the rest of the bathroom. With this form of enclosure it is desirable to have a ventilating grill at the top to provide for air circulation and escape for vapor which may accumulate during a hot bath.
To provide ample room for the bather, such enclosures are made either 38 by 38 inches, or where the Regal porcelain receptor is used 39 by 40 inches. In an enclosure of these dimensions the bather will find plenty of elbow room and ample space for the various needle streams to strike the body with exhilarating results. When the enclosure is constructed of marble, it is desirable to use under the marble floor slab a lead pan with its sides well up within the sides and sills of the enclosure and a lead pipe running therefrom to a tell-tale in the basement. This pan will catch any seepage draining through the joints and prevent damage to any ceiling underneath.

By many, the thermostat mixing valve is considered an indispensable feature in a modern shower enclosure, and is therefore being extensively installed in both private homes and public institutions. This device enables each bather to set the valve so that it delivers water at a prescribed temperature, thus preventing any possibility of scalding or chilling. As shown in the first illustration, such a shower is usually equipped with a small test nozzle just above the receptor, so that the bather before getting under the shower may test the temperature by allowing a small trickle to run through the test tube on to the foot.
Sometimes tiled-in shower enclosures are desired equipped merely with the overhead shower and a mixing valve and without the needle bath. Such a design is illustrated here.

Whenever a smaller needle shower is desired, the single horseshoe type will prove a very satisfactory design. Such a shower is proving very popular for use over tiled-in bathtubs, as well as in shower enclosures. Like the regular circular needle bath, the needle horse shoe and shower head are controlled by two independent valves, both supplied from one mixing valve. The bather may take either a needle bath or an overhead shower, or both simultaneously.

Another extremely popular type of shower for homes, clubs and hotels is equipped with a rain shower head on an adjustable ball joint and mixing valve. The head throws a fine rain-like spray and the adjustable ball joint enables the bather to arrange the shower head so that the stream may be deflected from the shoulder down when it is desired to take a bath without wetting the hair. This design may be installed on the wall, as shown, or in the wall when used with tiled-in bath.

To operate successfully large circular needle baths and overhead showers there should be at least twenty-five pounds water pressure, with an ample volume of supply, and the supply pipes to the shower valve should be one inch in diameter. Single horse shoe needle baths can be operated with this pressure and three-quarter inch supplies. Overhead rain showers are successfully operated through half-inch supply pipes, although there may be pressure, volume and piping conditions where the above general rules may need modification.

* * *

New Laws Governing Construction Work in California

By J. J. ROSEDALE, Construction Engineer

At THE last session of the legislature, the following four laws governing construction work were passed and are now in effect and being enforced by the department of safety of the Industrial Accident Commission:

The use of dangerous equipment and false work is a misdemeanor.

Section 402 (c) of the Penal Code (Chapter 55), provides that any person employing another to perform any labor in the construction, alteration, repairing, painting or cleaning of any building or other structure within this state, who furnishes or erects, or causes to be furnished or erected for the performance of such labor, unsafe or improper scaffolding, slings, hammers, blocks, pulleys, stays, braces, ladders, irons, ropes or other mechanical contrivances, or who hinders or obstructs any officer or inspector of the Industrial Accident Commission attempting to inspect the same under the provisions of any statute of the State of California or safety order of the Industrial Accident Commission, or who destroys or defaces, or removes any notice posted thereon by any such officer or inspector, or permits the use thereof, after the same has been declared unsafe, by such officer or inspector, contrary to the provisions of said acts or orders, shall be guilty of a misdemeanor.

Elevators used in buildings during the course of construction must be made safe.

Chapter 332, Laws of 1921, provides that every hoist used in buildings during the course of construction must have an adequate system of signals as provided in the General Construction Safety Orders issued by the Industrial Accident Commission. This act further provides that hoists must be properly constructed so as not to endanger the lives of employees working in the immediate vicinity of such hoists.
All scaffolds ten feet above the ground must have safety railings.

Chapter 333, Laws of 1921, provides that all scaffolding or staging suspended from an overhead support more than ten feet from the ground or floor shall have a safety rail of rigid material and of sufficient strength to protect workmen from falling. Any and all parts of such scaffolding shall be of sufficient strength to support, bear or withstand with safety, any weight of persons, tools, appliances or materials that may be placed thereon or that are to be supported thereby while such scaffolding is being used. The Industrial Accident Commission of the State of California is authorized to make and enforce safety orders to supplement and carry into effect the purposes and provisions of this act.

Temporary floors to protect workmen from falling and from being hit by falling materials.

Chapter 334, Laws of 1921, provides that any building more than two stories high in the course of construction shall have the joists, beams or girders of every other floor or level where any work is being done, or about to be done, covered with flooring laid close together, to protect workmen engaged in such building from falling through joists or girders, and from falling planks, bricks, rivets, tools, or any other substance, whereby life and limb are endangered. The floors in reinforced concrete buildings must be constructed before the commencement of work upon the walls of the second floor above. Buildings having wooden floors, other than steel frame buildings, must have the underflooring, if double flooring is to be used, laid on each floor before commencement of work upon the walls of the second floor above. Where single wooden floors are to be used, each floor shall be planked over before the commencement of work upon the floor of the next floor above.

Buildings of structural frame of iron or steel shall have the entire floor of each story, except such spaces as may reasonably be required for the proper construction of such buildings, thoroughly covered with planks tightly laid together, so that workmen shall have at all times planked floors within two stories below them.

Where spans between beams in steel frame buildings exceed thirteen feet, intermediate beams must be used to support the temporary flooring; provided, however, that spans not exceeding sixteen feet may be covered by three-inch planks without such beams. When intermediate beams are used, they shall be of sufficient strength to sustain live loads of fifty pounds per square foot of the areas supported.

Intermediate flooring or safety nets must be provided in all buildings where the distance between planked floors exceeds twenty-five feet.

When the steel columns in buildings are spliced at every story, the erection gang must in no case be more than two stories distant from the riveting gang. If the columns are spliced every second or third story, the erection gang must in no case be more than four stories distant from the riveting gang.

Planked floors must consist of planks tightly laid together of number one common lumber, not less than two inches thick and eight inches wide, free from protruding nails or other objects. Nets shall consist of at least one and one-half inch manila rope with three-quarter inch borders, and four by four inch mesh. The borders of the nets shall be provided with loops so that they can be readily combined or attached to convenient points on the structural frame.

The act provides that no owner, agent of the owner, general contractor, subcontractor, or other person shall proceed with any work assigned to or undertaken by him, or require or permit any other person to proceed with work assigned to or undertaken by either, unless the planking or nets required by this act are in place. Violation of this section shall constitute a misdemeanor.

* * *

Good Paint Best Medicine for Unprotected Surfaces

By C. A. STEDMAN

"SAVE the Surface" is a slogan which has become pretty well impressed upon the minds of our thinking people during the last year and a half. It was born of an idea—a great idea—that of preventing property depreciation via the surface route.

Premature decomposition of surfaces is the dilemma which "save the surface" seeks to avoid. When this campaign to protect surfaces was pro-
jected, it was pointed out that about three times as many dollars in property losses were incurred each year in the United States from preventable decay as from fire; and yet the amount paid in premiums for protection against fire, exceeded the amount paid for protection against decay (paint purchases) in about the same proportion.

Manifestly, the "save the surface" argument is sound. It is economic. In these post-war days when property owners are beginning to feel the burden of decreased profits, a prescription for saving the surface is distinctly acceptable.

But—

How best to do the job! The subject reverts to a discussion of quality paints, since the preferred prescription that is to cure the patient must contain efficacious medicine.

Now, coming down to greater detail, we find that those paints containing the proper proportion of zinc oxide are the indicated medicines. And venturing onto the technical, we reason that zinc oxide, being of extremely fine particle size, when mixed with the proper oil, penetrates into the minute pores of the surface. This assures firm anchorage and furnishes protection to that surface against the elements, the agency that destroys.

This discussion does not contemplate the use of zinc oxide to the exclusion of other materials. It urges only a partnership between zinc and other properly selected pigments. As the physician and the nurse operate in the treatment of their sick patient, so does each pigment have certain duties to perform in its fight against an unseen, inanimate foe.

One of the foremost master painters of this country has said of zinc: "Zinc is the reinforcing element that overcomes the weak points of lead, the two, in combination, form the ideal paint film."

Speaking of zinc, used for exterior and interior painting the world over, some of its functions when used in paint are these:

1. It retards chalking.
2. Reduces fading or discoloration.
3. Insures smooth, clean surface.
4. Imparts permanence, or durability, to the coating.

So, it is seen that when quality paints are prescribed to "doctor" up the residence, barn, silo, hen-coop or other urban, suburban or rural edifice, it may be regarded as certain that not the least important of the ingredients contained is zinc oxide, not always heard about, but a factor not to be overlooked in the campaign being waged against the ravages of time and weather.

* * *

Effective Furniture Arrangement

It is a mistake to suppose that an effective furniture arrangement depends either on a striking color scheme or emphasis of any one period. It is considered good taste by the majority of interior decorators, to combine a number of pieces of different styles if they are sympathetic in line. When placed in harmonious relation, one to another, they create a graceful and balanced grouping for a small room. The dining room is the single exception to the above rule. Here, where family and friends meet in the intimate confidences that make our home life particularly interesting, no small amount of formal dignity and characteristic refinement is demanded by discriminating people in the better homes.
The Status of Zoning in Cities of the United States*

THE following is a list of the cities in which zoning is in effect:

<table>
<thead>
<tr>
<th>CITY</th>
<th>DATE OF ADOPTION OF ORDINANCE</th>
<th>CONSULTANT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alameda, Calif.</td>
<td>1919</td>
<td>Charles H. Cheney</td>
</tr>
<tr>
<td>Caldwell, N. J.</td>
<td>September 19, 1921</td>
<td>George B. Ford</td>
</tr>
<tr>
<td>Cleveland Heights, O.</td>
<td>August 2, 1921</td>
<td>Robert H. Whitten</td>
</tr>
<tr>
<td>Cliffside Park, N. J.</td>
<td>September 27, 1920</td>
<td>Herbert S. Swan</td>
</tr>
<tr>
<td>Coronado, Calif.</td>
<td>February, 1921</td>
<td></td>
</tr>
<tr>
<td>Cudahy, Wis.</td>
<td>July 16, 1919</td>
<td></td>
</tr>
<tr>
<td>East Cleveland, O.</td>
<td>1919</td>
<td>Robert H. Whitten</td>
</tr>
<tr>
<td>East Orange, N. J.</td>
<td>March 16, 1921</td>
<td>George B. Ford</td>
</tr>
<tr>
<td>Evanston, Ill.</td>
<td>January 18, 1921</td>
<td>Harland Bartholomew</td>
</tr>
<tr>
<td>Glencoe, Ill.</td>
<td>May 9, 1921</td>
<td></td>
</tr>
<tr>
<td>Glenridge, N. J.</td>
<td>March 3, 1920</td>
<td>Herbert S. Swan</td>
</tr>
<tr>
<td>Glenside, N. Y.</td>
<td>April 11, 1921</td>
<td>E. E. Christopher</td>
</tr>
<tr>
<td>Los Angeles, Calif.</td>
<td>1909, etc.</td>
<td></td>
</tr>
<tr>
<td>Maplewood, N. J.</td>
<td>1921</td>
<td>Frank B. Williams</td>
</tr>
<tr>
<td>Milwaukee, Wis.</td>
<td>November 15, 1920</td>
<td>Arthur C. Comey</td>
</tr>
<tr>
<td>Montclair, N. J.</td>
<td>May, 1921</td>
<td>Herbert S. Swan</td>
</tr>
<tr>
<td>Nenah, Wis.</td>
<td>May 5, 1915</td>
<td></td>
</tr>
<tr>
<td>Newark, N. J.</td>
<td>January 3, 1920</td>
<td>Herbert S. Swan</td>
</tr>
<tr>
<td>New York City, N. Y.</td>
<td>July 25, 1916</td>
<td>George B. Ford</td>
</tr>
<tr>
<td>Niagara Falls, N. Y.</td>
<td>August 20, 1920</td>
<td>John Nolen</td>
</tr>
<tr>
<td>Oakland, Calif.</td>
<td>April, 1919</td>
<td></td>
</tr>
<tr>
<td>Omaha, Neb.</td>
<td>June 29, 1920</td>
<td>Harland Bartholomew</td>
</tr>
<tr>
<td>Palo Alto, Calif.</td>
<td>August 16, 1918</td>
<td>Charles H. Cheney</td>
</tr>
<tr>
<td>Pasadena, Calif.</td>
<td>October 1, 1919</td>
<td></td>
</tr>
<tr>
<td>Pomona, Calif.</td>
<td>March, 1917, and April, 1920</td>
<td></td>
</tr>
<tr>
<td>Racine, Wis.</td>
<td>October 3, 1916</td>
<td></td>
</tr>
<tr>
<td>Rahway, N. J.</td>
<td>August 11, 1920</td>
<td></td>
</tr>
<tr>
<td>Rochester, N. Y.</td>
<td>September 22, 1919</td>
<td>E. A. Fisher</td>
</tr>
<tr>
<td>Sacramento, Calif.</td>
<td>June 12, 1917</td>
<td></td>
</tr>
<tr>
<td>San Francisco, Calif.</td>
<td>October 3, 1921</td>
<td></td>
</tr>
<tr>
<td>St. Louis, Mo.</td>
<td>May, 1918</td>
<td>Harland Bartholomew</td>
</tr>
<tr>
<td>Santa Barbara, Calif.</td>
<td>May, 1920</td>
<td></td>
</tr>
<tr>
<td>South Orange, N. J.</td>
<td>1921</td>
<td>George B. Ford</td>
</tr>
<tr>
<td>South Pasadena, Calif.</td>
<td>September, 1920</td>
<td></td>
</tr>
<tr>
<td>Tacoma, Wash.</td>
<td>June 4, 1919</td>
<td></td>
</tr>
<tr>
<td>Turlock, Calif.</td>
<td>1918</td>
<td>Charles H. Cheney</td>
</tr>
<tr>
<td>Washington, D. C.</td>
<td>August 30, 1920</td>
<td>Harland Bartholomew</td>
</tr>
<tr>
<td>Westfield, N. J.</td>
<td>August, 1921</td>
<td>George B. Ford</td>
</tr>
<tr>
<td>West Orange, N. J.</td>
<td>September 19, 1921</td>
<td>George B. Ford</td>
</tr>
<tr>
<td>White Plains, N. Y.</td>
<td>June 7, 1920</td>
<td>Herbert S. Swan</td>
</tr>
<tr>
<td>Yonkers, N. Y.</td>
<td>1920</td>
<td>Herbert S. Swan</td>
</tr>
</tbody>
</table>

The following is a list of the cities in which zoning regulations are in progress:

<table>
<thead>
<tr>
<th>CITY</th>
<th>DATE OF ADOPTION OF ORDINANCE</th>
<th>CONSULTANT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Atlanta, Ga.</td>
<td>Plans in progress</td>
<td>Robert H. Whitten</td>
</tr>
<tr>
<td>Buffalo, N. Y.</td>
<td>Plans in progress</td>
<td></td>
</tr>
<tr>
<td>Chicago, Ill.</td>
<td>Commission appointed July 22, 1921</td>
<td>George B. Ford</td>
</tr>
<tr>
<td>Cincinnati, O.</td>
<td>Studies just begun</td>
<td>Robert H. Ford</td>
</tr>
<tr>
<td>Cleveland, O.</td>
<td>Ordinance prepared</td>
<td>Robert H. Whitten</td>
</tr>
<tr>
<td>Dallas, Texas</td>
<td>Ordinance prepared</td>
<td>Robert H. Whitten</td>
</tr>
<tr>
<td>Detroit, Mich.</td>
<td>Ordinance prepared</td>
<td>Harland Bartholomew</td>
</tr>
<tr>
<td>Elizabeth, N. J.</td>
<td>Ordinance prepared</td>
<td>George B. Ford</td>
</tr>
<tr>
<td>Gary, Ind.</td>
<td>Ordinance prepared</td>
<td>Edward H. Bennett</td>
</tr>
<tr>
<td>Grand Rapids, Mich.</td>
<td>Plans nearly ready</td>
<td>Harland Bartholomew</td>
</tr>
<tr>
<td>Hamilton, O.</td>
<td>Ordinance prepared</td>
<td>Harland Bartholomew</td>
</tr>
<tr>
<td>Hoboken, N. J.</td>
<td>Ordinance prepared</td>
<td>Herbert S. Swan</td>
</tr>
<tr>
<td>Hutchinson, Kans.</td>
<td>Ordinance prepared</td>
<td>Harland Bartholomew</td>
</tr>
<tr>
<td>Lakewood, O.</td>
<td>Ordinance prepared</td>
<td>Robert H. Whitten</td>
</tr>
<tr>
<td>Lincoln, Neb.</td>
<td>Just starting</td>
<td></td>
</tr>
<tr>
<td>Long Beach, Calif.</td>
<td>Ordinance in preparation</td>
<td>Charles H. Cheney</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CITY</th>
<th>DATE OF ADOPTION OF ORDINANCE</th>
<th>CONSULTANT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Madison, Wis.</td>
<td>Plans nearly ready</td>
<td>Harland Bartholomew</td>
</tr>
<tr>
<td>Memphis, Tenn.</td>
<td>Plans nearly ready</td>
<td>Harland Bartholomew</td>
</tr>
<tr>
<td>Minneapolis, Minn.</td>
<td>Ordinance prepared</td>
<td>George B. Ford</td>
</tr>
<tr>
<td>Orange, N. J.</td>
<td>Ordinance prepared</td>
<td>George B. Ford</td>
</tr>
<tr>
<td>Paso Robles, Calif.</td>
<td>Ordinance in preparation</td>
<td>Charles H. Cheney</td>
</tr>
<tr>
<td>Paterson, N. J.</td>
<td>Hearings in progress</td>
<td>Herbert S. Swan</td>
</tr>
<tr>
<td>Phoenix, Ariz.</td>
<td>Plans in progress</td>
<td>Edward H. Bennett</td>
</tr>
<tr>
<td>Pittsburg, Pa.</td>
<td>Ordinance prepared</td>
<td>Harland Bartholomew</td>
</tr>
<tr>
<td>Portland, Ore.</td>
<td>Ordinance defeated on ref., 1920</td>
<td>Charles H. Cheney</td>
</tr>
<tr>
<td>Rock Island, III</td>
<td>Plans in progress</td>
<td>Edward H. Bennett</td>
</tr>
<tr>
<td>Rutherford, N. J.</td>
<td>Plans nearly ready</td>
<td>George B. Ford</td>
</tr>
<tr>
<td>St. Paul, Minn.</td>
<td>Plans nearly ready</td>
<td>Edward H. Bennett</td>
</tr>
<tr>
<td>San Francisco, Calif.</td>
<td>Ordinance in preparation</td>
<td>Charles H. Cheney</td>
</tr>
<tr>
<td>Spokane, Wash.</td>
<td>Ordinance completed</td>
<td>George B. Ford</td>
</tr>
<tr>
<td>Springfield, Mass.</td>
<td>Studies just begun</td>
<td>George B. Ford</td>
</tr>
<tr>
<td>Toledo, O.</td>
<td>Commission at work</td>
<td>George B. Ford</td>
</tr>
<tr>
<td>Tarrytown, N. Y.</td>
<td>Ordinance prepared</td>
<td>George B. Ford</td>
</tr>
<tr>
<td>Troy, N. Y.</td>
<td>Studies just begun</td>
<td>George B. Ford</td>
</tr>
<tr>
<td>Wichita, Kans.</td>
<td>Plans nearly ready</td>
<td>Harland Bartholomew</td>
</tr>
<tr>
<td>Willmette, III.</td>
<td>Ordinance prepared</td>
<td>Harland Bartholomew</td>
</tr>
<tr>
<td>Winnetka, Ill.</td>
<td>Ordinance prepared</td>
<td>Harland Bartholomew</td>
</tr>
</tbody>
</table>

**Will Take 5 Years to Overcome Nation’s House Shortage**

The housing shortage in this country will not be overcome within the next five years, even with the best of good fortune. This statement was made by Mr. John Ihlder, manager of the Civic Development Department of the Chamber of Commerce of the United States, before the recent housing conference of the American Society of Civil Engineers held in New York City.

Mr. Ihlder said that even the well-to-do would not be as adequately provided with good housing in 1927 as they were in 1914.

"As for the wage-earner, let alone the poor, their problem will be with us a good deal longer," he said. "Consequently it is part of common sense to base our proposals on the proposition that the campaign will be long continued and that whatever is to produce results must be economically sound."

Mr. Ihlder pronounced as dangerous some of the so-called "emergency" housing legislation. He pointed out that during the last two years there has been legislation not based upon any deep study, and designed merely to check, temporarily, certain abuses from which a vocal part of the community is suffering. Legislation designed, not to cure, but simply to reduce irritation, he said, is likely to have effects quite unlooked for.

Mr. Ihlder explained that during the war he was an advocate of government housing for war workers.

"That was a time of real emergency and it had a definite terminal point, the end of the war," he said. "Today the situation is fundamentally different. What we do now has no definite terminal point. Any date we may set is easily changed. What we do now sets precedents, establishes a habit of mind which will carry on. So it is important that our precedents, our habits of mind, have in them the possibility of continued growth and development. Adequate and good housing must pay a fair return on the investment. Only so can we be assured of enough good, new housing to meet our growing needs and our rising standards."

Speaking of building costs, Mr. Ihlder said that "so far as experience goes, such short cuts to the millennium as government building and management do not promise to reduce real costs. Government operation, not only in this country but in others whose distance gives a haze of enchantment, has, as a rule, proved clumsy, inefficient, and expensive. Certain functions must necessarily be performed by government, but the burden of proof is always on those who would transfer new functions to the government. So far, proof is lacking that governmental construction or management of housing would produce better or as good results in America as would private."
Mr. Willis Polk has written a letter to Mr. Jno. A. McGregor congratulating him on his election as member of the San Francisco Board of Supervisors and expressing confidence for the future of San Francisco because of Mr. McGregor's election. Mr. Polk trusts that the supervisor will find practical means for realizing the Chamber of Commerce's plan for the industrial development of San Francisco, as prepared by Dr. B. M. Rastall.

Mr. Polk suggests that a meeting in furtherance of the Rastall plan, under the auspices of the city, be held at an early date, and that the attendance by invitation of Mr. Charles H. Wacker, chairman of the Chicago Plan Committee, and Mr. Edward H. Bennett, successor of the late D. H. Burnham, in city planning projects, be secured.

At this meeting, ideals sought for by Dr. Rastall could be made clear and the experience of Chicago and other cities in overcoming opposition be explained. No doubt, as a result of such a meeting, great progress could be made toward a realization of a truly great plan for our city.

A city beautiful need not mean an increased tax rate—it would only mean such an added increment of wealth as would reduce, rather than increase, the individual's contribution of taxes, and permit all to participate in the city's welfare.

Pericles, not for art's sake, but as a matter of pure statesmanship, made Athens beautiful, and for two thousand years the world has paid tribute to Greece.

That great, elusive, ever-sought-after quality, artistic charm, must not be missing.

As Mr. Burnham said: "Make no little plans; they have no magic to stir men's blood, and probably themselves will not be realized. Make big plans; aim high in hope and work, remembering that a noble, logical diagram once recorded will never die, but long after we are gone will be a living thing, asserting itself with ever-growing insistency. Remember that our sons and grandsons are going to do things that would stagger us, let your watchword be order and your beacon beauty."

**Notes and Comments**

Sentences of imprisonment, with fines of $4,000 each, assessed against four of seventy defendants before Federal Judge Van Fleet in New Jersey on charges of violating the Sherman Act in connection with the sale of building tile will result, it is believed, in renewed effort to bring convictions in instances where it has been found that arbitrary practices have served to increase the housing shortage, or prevent the prompt resumption of building and construction work since the war.
The action of Judge Van Fleet in imposing prison sentences — the first since the Sherman law was passed in 1890 — was unexpected even by the government prosecutors, and was a surprise to the officials of the Department of Justice. Several cases of similar aspect to that tried before Judge Van Fleet are pending in the federal courts, and these will be pushed with new energy, it is asserted.

The fines and prison sentences imposed by Judge Van Fleet were against four of the members of the Tile, Grate and Mantle Manufacturers' and Dealers' Association in New York. They had previously entered a plea of guilt under section 1 of the Sherman law. Twenty-nine other defendants were fined sums of $500 to $5,000, while eleven corporations were fined $4,000 each, and six other corporations sums of $500 to $2,500.

Officials of the Department of Justice attach great importance to the statement of Judge Van Fleet in imposing sentence on the defendants, particularly his declaration that perhaps there has not been a more important prosecution brought under the Sherman act than the one then before him. After reviewing the acute housing shortage in 1920, he said:

"While the primary cause of these conditions was perhaps largely the outgrowth of the World War, and while in a large measure doubtless the rent profiteer contributed to the hardship, there can be no question but that this situation was aggravated in grave measure by certain unlawful combinations among groups of men engaged in the business of supplying building material of the character with which we are here dealing."

According to information recently sent out by the National Board of Revised Chimney Fire Underwriters, Municipalities New York, the records of the past five years, covering the whole United States, show that defective chimneys and flues rank fourth in the list of most prolific causes of fire. Hence the need for correcting this great evil is quite apparent. It is a scourge which affects cities, hamlets, and isolated buildings alike, and imperils both life and property, yet the remedy is simple and inexpensive, as compared to the risk involved.

The National Board has just finished revision of the chimney ordinance, which has had thorough consideration and discussion by various technical organizations, architects and engineers, who have cooperated generously in an endeavor to frame requirements which would not only produce a fire-safe chimney, but would also furnish satisfactory draft under all conditions.

A lack of intelligent consideration of this latter feature of chimney flue construction in the past is claimed by heating engineers and manufacturers of heating devices to be a source of mending trouble and expense.

The ordinance now bears the endorsement of twelve national organizations interested in the subject, and this is evidence that as thus submitted it conforms reasonably with the mature ideas of the numerous experts who have cooperated in the revision.

There is such a thing as too pure lead for roofing purposes. The ancient Gothic cathedrals of Europe were topped with this grey metal that blended well with the stone work and the style of architecture.

Lead was the metal that was specified for the roof of the Episcopal Cathedral of Washington, which is now being built, but after it had been applied for some time, it was found that sheet lead on the steep roof slopes had a tendency to flow downward under its own weight and the heat of the sun. The nail holes enlarged and allowed the metal to slip partially off.

Metallurgists of the Bureau of Standards of the Department of Commerce were called upon and
American Institute of Architects

(ORGANIZED 1857)

OFFICERS FOR 1920-21

President ............... Henry H. Kendall, Boston
First Vice-President ...... Charles A. Fawot, New Orleans, La.
Second Vice-President ... Wm. F. Faville, San Francisco
Secretary......... W. Stanley Parker, Boston, Mass.
Treasurer .............. D. Everett Waid, New York

San Francisco Chapter

President............... G. A. Applegarth
Vice-President ........... Earnest A. Coxhead
Secretary-Treasurer ...... J. S. Fairweather
Directors .................. W. B. Faville, Wm. Mooser, John Reid, Jr.
                      S. Schnaittacher Geo. W. Kelham
                      Morris M. Bruce

Southern California Chapter

President................. Sumner P. Hunt
Vice-President ........... Reginald Johnson
Secretary ............... C. E. Flummer
Treasurer ................ O. R. Bean
Executive Committee
                      A. M. Edelman, D. C. Allison, S. B. Marston

Portland, Ore. Chapter

President ............... W. C. Knighton
Vice-President ........... John C. Bowers
Secretary-Treasurer ...... J. C. Russell,
                      Tacoma, Wash.
                      Harold A. Sexton, Spokane
                      Carl Siebrand, Seattle
                      J. H. Albertson
Directors .................. J. S. Cote, F. G. Field

California State Board of Architecture

NORTHERN DISTRICT

President............... Clarence R. Ward
Secretary-Treasurer ...... Sylvain Schnaittacher
                      Members: J. R. Miller, Elwood Glass, J. J. Donovan
Address all communications to the Secretary, 1039 Phelan building, San Francisco.

SOUTHERN DISTRICT

President............... John Parkinson
Secretary-Treasurer ...... A. M. Edelman
                      Members: W. H. Wheeler, Myron Hunt, W. J. Dodd
Address all communications to the Secretary, H. W. Hellman building, Los Angeles.

San Francisco Architectural Club

President ............... T. L. Pfeiffer
Vice-President ........... Wm. Watson, Jr.
Secretary ............... James F. McGuinness
Chairman ............... John A. Peterson
Directors .................. Fred G. Munk, S. D. Willard, H. E. Burnett

San Francisco Society of Architects

President ............... Clarence R. Ward
Vice-President ........... Herman Barth
Secretary-Treasurer ...... H. H. Gutterson
Directors .................. W. C. Hays

Washington State Society of Architects

President............... R. H. Rowe, Seattle
First Vice-President ... Clayton D. Wilson, Seattle
2d Vice-President ... Julius A. Zittel, Spokane
3d Vice-President .. Wm. T. Vernon, Aberdeen
4th Vice-President ... Richard V. Gough, Omak
Secretary ............... L. E. Pearson
Treasurer ................ H. H. James, Frank Fowler, A. Warren Gould, W. J. Jones, R. H. Rowe, all of Seattle.

Secretary-Treasurer ...... W. H. Patch
                      Trustees: H. H. James, Frank Fowler, A. Warren Gould, W. J. Jones, R. H. Rowe, all of Seattle.

American Society of Landscape Architects

Pacific Coast Chapter

President ............... W. D. Cook, Jr.
                      H. W. Hellman Bldg., Los Angeles, Calif.
                      Vice-President ........... Stephen Childs
                      Fairmont Hotel, San Francisco, Calif.
                      Secretary-Treasurer ...... E. T. Misch
                      Henry Bldg., Portland, Oregon

Caroma Society of Architects

President ............... Roland E. Borhek
                      Vice-President ........... Earl Dunig
                      Secretary and Treasurer ...... A. J. Russell

San Diego Architectural Association

President ............... Wm. Templeton Johnson
                      Vice-President ...... Robert Halley, Jr.
                      Secretary-Treasurer ...... E. C. Decker

American Society of Civil Engineers

San Francisco Association

President ............... M. M. O'Shaughnessy
                      1st Vice-President ........... F. D. Howell
                      2nd Vice-President ... W. M. Bowers
                      Secretary and Treasurer ...... Nathan A. Bowers
                      Board of Directors
                      W. L. Hines, F. R. Muhs
                      M. M. O'Shaughnessy
                      E. J. Schneider
                      Nathan A. Bowers
                      Address all communications to the secretary, 502 Rialto Bldg., San Francisco.

Southern California Association

President ............... R. J. Reed
                      First Vice-President ........... F. D. Howell
                      Second Vice-President ...... W. H. Code
                      Treasurer .................... E. R. Bowen
                      Secretary ..................... F. G. Dessery
                      Directors: H. W. Dennis, Ralph J. Reed,
                      F. D. Howell, E. R. Bowen, F. G. Dessery, W. H. Code,
                      W. K. Barnard
                      Address all communications to Secretary F. G. Dessery,
                      619-20 Central building.

American Association of Engineers

President ............... L. K. Sherman
                      First Vice-President ........... H. O. Garman
                      Second Vice-President ...... A. B. McDaniel
                      R. W. Barnes ............... Portland
                      Frederick Bass ............. Minneapolis
                      B. A. Bertenshaw .......... Cincinnati
                      W. C. Bollin ............... Chicago
                      Raymond Burnham .......... Chicago
                      C. E. Drayer ............... Secretary
                      National Headquarters, 63 E. Adams St., Chicago

San Francisco Chapter

President ............... W. H. Phelps
                      First Vice-President ...... Geo. Mattis
                      Second Vice-President ...... D. M. Baker
                      Treasurer ..................... E. M. Ammons
                      Secretary ..................... Captain, A. J. Capron
                      Permanent address, 960 Pacific Bldg.

Los Angeles Chapter

President ............... H. Z. Osborne, Jr.
                      First Vice-President ........... H. C. Ferry
                      Second Vice-President ...... W. W. Patch
                      Treasurer ..................... E. H. Merrill
                      Secretary ..................... Willis S. Peppers
                      Permanent address, 625 Metropolitan Bldg.,
                      Los Angeles.
With the Architects

Building Reports and Personal Mention of Interest to the Profession

Newsom & Newsom Have Much Work

The new year started well with the architectural firm of Sidney B. and Noble Newsom, Nevada Bank building, San Francisco. This firm has completed plans for a large 12-room Spanish type residence to be built in Piedmont, for Mr. Chas. C. Keeley, at a cost of $32,000, and they have also made plans for a $22,000 12-room home in Crocker Highlands, Oakland, for Mr. G. T. Henshaw. Other work includes a three-story frame apartment house to be built in San Francisco, at an estimated cost of $20,000, for Mr. George Wahlheim. Plans have been completed for alterations and additions to the Oakland Baseball Park, and plans are on the board for a $9,000 residence in Thousand Oaks to be built of native rock.

Nine-story Office Building

Architects Reid Bros., California-Pacific building, San Francisco, are completing working drawings for a nine-story Class A store and office building for Mr. William Fitzhugh, at Post and Powell streets, San Francisco. This is the site of the proposed Loew theatre, construction of which was abandoned several months ago. The new building will contain 192 offices and a number of small stores and will represent a probable expenditure of at least $750,000.

Five-story Apartment House

Architect B. G. McDougall, 381 Bush street, San Francisco, has completed plans and taken bids for a five-story Class C reinforced concrete apartment house to be erected at Bush and Taylor streets, for Bertha Vasye, at an estimated cost of $50,000. Mr. McDougall has also completed plans for a $30,000 residence to be erected in Claremont Court, Berkeley, for Mr. J. D. Havre.

Apartments and Residence

Architect Houghton Sawyer, Hearst building, San Francisco, has completed plans for a three-story and basement frame and stucco apartment house to be erected on Vallejo street, near Taylor, San Francisco, for Mr. G. M. Hyde. Mr. Sawyer has also completed plans for an eight-room residence on Falcon place, San Francisco, for Mr. A. L. Bertini.

Kuhn & Edwards Busy

Architects Alfred Kuhn and Thomas M. Edwards, associated, with offices in the Commercial building, San Francisco, are preparing plans for a one-story reinforced concrete store building, 80 x 110, to be erected at Burlingame, at a cost of $35,000, also a two-story frame residence in the same town. They report having awarded contracts at $15,000 for a two-story reinforced concrete store and apartment building at Burlingame for Mr. A. L. Offield, and a two-story store and apartment building in the same town, for Mr. Lewis Rebelle, for $12,000.

Architect Baumann Busy

New work in the office of Architect H. C. Baumann, 251 Kearny street, San Francisco, includes a two-story reinforced concrete store and loft building for Mr. Herman Rumpf on Howard street, between First and Second streets, San Francisco, to cost $35,000; a one-story frame battery service station at Seventh avenue and Geary street, to cost $10,000; a two-story frame residence on Forty-fourth avenue and Balboa street, for Mr. M. Person, and two frame dwellings at Seaciff, for Mr. Leory Shay, to cost $12,000 each.

Mr. C. F. Hoffman to Build Apartments

Mr. C. F. Hoffman, of the Golden Gate Iron Works, 1541 Howard street, San Francisco, has had plans prepared for a three-story Class C apartment house, the floor of which will have a steel frame, to be erected on the southeast corner of Lake and Twelfth avenue, San Francisco. There will be nine apartments of five rooms each. Mr. C. O. Clausen, the architect, estimates the cost at $55,000.

Another Berkeley Store Building

Contracts were let the past month by Architect James W. Plachek for another store building to be erected in the business section of Berkeley, at an approximate cost of $40,000. This is the third store building planned by Mr. Plachek within the last sixty days. The owner is Blanche L. Porter and the location is opposite the Masonic Temple, at Bancroft and Shattuck avenues.
Some Big Building Projects for Los Angeles This Year

Following are some of the more important building projects announced for Los Angeles and Southern California this year:

Class A hotel building, 12 stories, 360x165 ft., 1000 rooms, southwest corner of Fifth and Olive Sts.; Biltmore Hotel Co., owner; Schultz & Wylde, architects. Estimated cost, $200,000.

Fifth Street department store building, 11 stories, 167x104 ft., southwest corner Fifth and Broadway; Faris-Walker Co., owners; A. E. Curlett, Merchants National Bank Bldg., architect. Building will be erected in three units; excavation for first unit about completed; Clinton Construction Co., general contractors. Estimated cost, $2,250,000.


Central public library building, Normal Hill Center; B. F. Goodhue, New York City, and Charlotte M. Winslow, Van Nuys Bldg., Los Angeles, associated architects. Plans being prepared. Estimated cost, $1,500,000.

Reinforced concrete office building, 3 stories, 267x207 ft., southwest corner of Adams and Figueroa Sts.; Automobile Club of Southern California, owner; J. C. Austin, Baker-Detwiler Bldg., architect; steel ordered and contract for foundation let to Wm. Simpson Constr. Co. Estimated cost, $500,000.

Stadium, reinforced concrete, seating capacity 75,000, Exposition Park; Community Development Association, owner; John Parkinson and Donald Parkinson, Title Insurance Bldg., architects; Edwards, Wildey & Dixon Co., Black Bldg., general contractors; excavation started. Cost, $800,000.


Class A office building, steel frame, 6 stories, 132x120 ft., Ocean Ave., Long Beach; Seaside W. & L. Co., owner; J. C. Austin, Baker-Detwiler Bldg., Los Angeles, architect. Plans now being prepared. Estimated cost, $400,000.

Two story dining room, etc., reinforced concrete construction, Boyle Ave.; buildings 2 stories and basement, 60x150 ft. and 50x120 ft.; Hellenbeck Home, owner; Morgan, Walls & Morgan, Van Nuys Bldg., architects. Plans prepared; work started. Estimated cost, $60,000.

Hollywood branch public library building; W. J. Dodd and Wm. Richards, Braekshades Bldg., architects. Plans being prepared. Estimated cost, $80,000.

Shrine auditorium, Class A construction, steel and concrete, seating room capacity about 5000, Jefferson and Royal Sts.; Al Malaikah Temple, owner; John C. Austin, Baker-Detwiler Bldg., and A. M. Edelman & S. H. Feldman, associated architects. Working plans are being prepared. Estimated cost, $1,000,000.

Reinforced concrete hospital buildings, Santa Barbara; St. Francis Hospital, owner; E. L. Mayberry, Pacific Electric Bldg., Los Angeles, and Charles H. Schwab & Co., Santa Barbara, associated architects; contract just awarded to J. Y. Parker, Santa Barbara. Cost, $315,000.

Church at Melrose Ave. and Berendo St., Los Angeles; M. Lewis, Methodists, owner; Robert H. Orr, Van Nuys Bldg., architect. Preliminary plans made. Estimated cost, $300,000.

Church on Morgan Place Blvd., Los Angeles; Hollywood Christian Church, owner; Robert H. Orr, Van Nuys Bldg., architect. Plans being prepared. Estimated cost, $150,000.

Church at Whittier; Christian Church, owner; Robert H. Orr, Van Nuys Bldg., Los Angeles, architect. Plans being prepared. Estimated cost, $500,000.

County jail at Santa Ana, 4 stories and basement, 100x125 ft., reinforced concrete; Orange county, owner; John Parkinson and Donald Parkinson, Los Angeles, architects. Bids now being taken. Estimated cost, $175,000.

Class A church buildings, Figueroa and West Adams Sts.; St. Johns Episcopal Church, owner; Pierpont and Walter S. Davis, 3215 W. Sixth St., architects. Preliminary plans made. Estimated cost, $200,000.

Reinforced concrete church, Tenth and Figueroa Sts.; Emmanuel Presbyterian Church, owner; C. F. Smith, owner; W. C. Sebastian, Los Angeles, architect. Working plans now being completed. Estimated cost, $100,000.

Class A lodge and club building, 175x170 ft., northwest corner Eighth and Flower Sts.; Los Angeles Lodge of Elks, No. 99, owner; Edward B. Longstem, Citizens National Bank Bldg., architect. Preliminary sketches made. Estimated cost, $1,500,000.

Reinforced concrete loft building, 4 stories, 52x118 ft., Seventh St., between Grand and Olive; Brock & Co., owners; W. J. Dodd and Wm. Richards, Braekshades Bldg., architects; Sceidfeld Engineering Construction Co., general contractors; excavation started. Estimated cost, $175,000.

Reinforced concrete general freight office building, 2 stories and basement, 80x200 ft., Hunter St., between Lemon and Alameda; Union Pacific Railroad Co., owner; John Parkinson and Donald Parkinson, Title Insurance Bldg., architects. Freight shed, 50x600 ft. and terminal improvements included in this project. Bids now being taken. Total estimated cost, $250,000.

Reinforced concrete hotel, 7 stories, 50x150 ft., southwest corner Cedar Ave. and Long Beach; Oscar H. Hubbard, owner; John Parkinson and Donald Parkinson, Title Insurance Bldg., architects. Plans being prepared. Estimated cost, $400,000.

Alter Stockton Building
Architect B. J. Joseph, Call building, San Francisco, is preparing plans for extensive alterations to a four-story store and office building at Main and Hunter streets, Stockton, owned by N. Levi & Bros.

Mutual Loan Building
Architects Binder & Curtis of San Jose are preparing plans for a two-story bank and office building to be erected on South First street, San Jose, for the Mutual Building & Loan Association, to cost $35,000.

Commissioned to Prepare Plans
Architects Wyckoff & White, Growers Bank building, San Jose, have been commissioned to prepare plans for a $100,000 grammar school building at Los Gatos.
Personal

Messrs. George E. Gable and C. Stanley Wyant have opened offices for the practice of architecture at 634 So. Western avenue, Los Angeles, under the firm name of Gable & Wyant, architects, and desire to receive manufacturers' catalogues and samples.

Prof. John Wm. Greg, of the University of California, and Mr. Frederick N. Evans, Superintendent of Parks, Sacramento, have been elected into membership of the Pacific Coast Chapter of the American Society of Landscape Architects.

Architect Elmer Grey, who has been seriously ill for several weeks, is recuperating at Carmel and expects to return to Los Angeles shortly. His work is being ably cared for by Mr. A. W. Hawes, his chief draftsman.

Architects Montgomery & Nibbecker have dissolved partnership, Mr. Montgomery retaining the office at 622 Story building, Los Angeles. Mr. A. S. Nibbecker, Jr., has established an office at 421 Washington building.

Architect Roy J. Kieffer has opened offices at 218 Wilshire building, Los Angeles, and desires a complete file of catalogues and samples of building material and equipment.

Messrs. H. D. Charlton and C. H. Brainard are now associated for the practice of architecture with offices at 113 E. Broadway, Glendale.

Architect Arthur W. Angell has moved his office to larger quarters at 325 H. W. Hellman building, Los Angeles.

Prizes of Rome in Architecture, Sculpture and Painting Announced

The American Academy in Rome announces its annual competitions for fellowships in architecture, sculpture and painting. They are each for a term of three years with a stipend of $3,000.00, with opportunity for travel. Studio and residence at the academy are provided free of charge and board at cost. The competitions, which will be held in various locations throughout the country and will probably begin in late March or early April, are open to all unmarried men, citizens of the United States. Entries will be received until March 1. Any one interested should apply for detailed circular of information and application blank to Roscoe Guernsey, executive secretary, American Academy in Rome, 101 Park avenue, New York, N. Y.

New Offices of Los Angeles Chapter, A. I. A.

Mr. Sumner P. Hunt was unanimously elected president of the Southern California Chapter of the American Institute of Architects at the December meeting. Other officers were elected as follows: Mr. Reginald Johnson, vice-president; Mr. Chas. F. Plummer, secretary; Mr. Alfred W. Rea, treasurer; and Mr. Edwin Bergstrom, director for three years.

The next national convention of the American Institute will be held in Chicago either in May or June. The president and secretary are ex-officio delegates and other delegates elected were: Messrs. Octavius Morgan, D. C. Allison, A. M. Edelman, Myron Hunt, Reginald Johnson, Robert H. Orr, and J. J. Backus. Alternates elected were: Messrs. Harwood Hewitt, F. Pierpoint Davis, John P. Krempeal, R. Germain Hubby and Henry F. Whitby.

The executive committee reported two new members by affiliation, Mr. Chas. H. Cheney, city planning architect, re-elected from the San Francisco Chapter, and Mr. Fitch H. Haskell of Pasadena, re-elected from the New York Chapter. Three new associate members have been elected: Messrs. Walter S. Davis, Edgar W. Maybury and Clyde Page.

Big Fresno Plant

The Sugar Pine Lumber Co., of San Francisco, Mr. Elmer Cox, president, has decided to erect a large plant at Fresno. The citizens of Fresno have subscribed $250,000 to provide a suitable site. The company plans to erect a mill to cost $2,500,000 and to construct a railroad and logging plants and equipment in the mountains to cost an additional $2,500,000.

San Francisco Skyscraper

Mr. John A. Hooper, San Francisco lumber and shipping merchant, has purchased the Parrott property, on the northwest corner of California and Montgomery streets, San Francisco, and announces he will erect a many-storied office building on the site in the near future.

Granted Certificates

The State Board of Architecture has granted certificates to practice architecture to the following: Mr. Roy L. Smith, 804 Higgins building, Los Angeles; Mr. J. W. F. Binderheim, with Mr. John C. Austin, Los Angeles; and Mr. O. Lincoln Rogers, San Diego.

San Francisco Residence

Mrs. L. Martin has had plans prepared by Architect M. V. Politeo, First National Bank building, San Francisco, for the erection of a two-story frame and plaster residence and garage at Seabright, estimated to cost $30,000.
Architects Selected for Los Angeles Libraries

The Los Angeles Public Library trustees advertised for bids for plans for a new library building to be erected under a $2,500,000 bond issue. The board has just awarded the commission to Mr. Bertram G. Goodhue of New York and Mr. Carlton M. Winslow of Los Angeles, who offered to design the structure for 4 per cent of the total cost of the building. This idea of inviting architects to build a new library is not a new one, for the selection of an architect for the Sacramento high school was made in a similar manner, despite considerable opposition by members of the profession.

The library board at Los Angeles, in explaining its course, has issued the following statement:

"At a meeting of the Los Angeles board of library directors, by a unanimous vote, Mr. Bertram G. Goodhue of New York City with his associate, Mr. Carlton M. Winslow of Los Angeles, were appointed the architects for the new Central Library building.

"Mr. Goodhue is an architect of national, it might be said of international, reputation, as in addition to many notable buildings in different sections of the United States, he has planned several churches in Cuba and is a recognized authority on Mexican architecture, a most interesting and important development of the Spanish style, which is favored by the Library Board for the new building. Mr. Goodhue is known throughout the eastern part of the country for his work in designing the new group of buildings for the United States Military Academy at West Point and for the Graduate School of Princeton University, St. Thomas' Church on Fifth avenue in New York City and the Chapel of the Intercession, also in New York, are other important examples of his skill. These are all in the Gothic style of architecture, but in recent years Mr. Goodhue has become more and more interested in the Spanish style. Buildings that he has planned in this style are chiefly in the southwest and include the San Diego Exposition group, especially the beautiful California building, the buildings for the United States Naval Air Station and for the United States Marine Base at San Diego, those for the California Institute of Technology in Pasadena, and for the entire industrial town of Tyrone, New Mexico, for the Phelps-Dodge Corporation. Mr. Goodhue has a summer residence at Montecito, near Santa Barbara, and has been in the habit of spending his summers in Southern California for some time past.

"Mr. Goodhue is not unfamiliar with the requirements of successful library planning, having designed libraries for several New England cities and has recently secured the contract for the Sterling Memorial Library at Yale University. This record of the important buildings that he has planned would not be complete without mention of the Nebraska State Capitol, the award for which he recently won in competition with several of the best known architects in the United States."

"It is felt by the Library Board that reliance can be placed on him to plan for the city of Los Angeles a most beautiful and successful structure.

"Associated with him will be Mr. Carlton M. Winslow, who has supervised Mr. Goodhue's work in this locality for the last seven or eight years. Mr. Winslow is now engaged independently upon two important contracts: that of the Fullerton High School and the Glendale Congregational church. The two men have worked together successfully on so many important enterprises that their association in the library project is another guarantee of its being carried through satisfactorily."

At the same meeting of the library board Messrs. Dodd and Richards were appointed architects for the Hollywood branch to be erected on the site of the present library in Hollywood. This firm acted as architects for the new Pacific Mutual and Pacific Finance buildings and many other Los Angeles structures of importance.

Architectural School at Pasadena

Architectural training under the direction and supervision of distinguished practicing architects and teachers amid a general art environment is now available to students with the opening of registrations for classes in the department of architecture in the atelier conducted by Director Lucile Lloyd at the studio rooms of the Sticklemy Memorial School of Art, Fair Oaks avenue, near Lincoln avenue, Pasadena.

Director Lloyd has been fortunate in obtaining the co-operation of Architects Reginald D. Johnson and Gordon B. Kaufman in establishing the department. Mr. Johnson has provided works from his library and equipment from his drafting rooms and will later assist the school with professional lectures and critical reviews of the work of the students.

Mr. Kaufman will have entire charge of architectural teaching and his assistance will be available to the students every step of the course. Class B students and beginners are now being enrolled. Arrangements have been made whereby the Beaux Arts competition problems will be open to students.

Next Institute Convention

The directors of the American Institute of Architects have accepted the invitation of the Illinois Chapter to hold the next annual convention at Chicago. The time will be in May.
Why Engineers Fail to Lead in City Planning

MANY engineers have experienced both regret and a touch of shame at the thought that an activity of so essentially an engineering character as city planning should be for the most part in the hands of other professions. The root of this trouble, as well as of its more general underlying cause, is struck in a brief article by Mr. Paul Green, consulting engineer, Chicago, in the December number of "The Professional Engineer," which is reprinted herewith in full:

City planning may be defined as the arrangement of the physical elements of the modern city or town so as to secure the greatest comfort, convenience, and material and moral welfare for the inhabitants. The problem requires careful consideration of transportation, sanitation, industrial management, public utilities and topography, as well as the related subjects of realty values and public welfare. It is primarily an engineer's work, but it is seldom, if ever, wholly by engineers.

A new profession of "city planners" has arisen of which it is estimated that three-fourths are landscape architects, one-eighth are architects, and the rest engineers. It seems absurd that the ratio is not reversed. There must be a reason.

The engineer who comes in contact with the usual city planner, trained as a landscape architect, is sometimes impressed with the apparent impracticality of the landscape man. It seems to the engineer that the town planner is doing little but draw curved streets on a topographical map. To this town planner the engineer frequently appears to be narrow, bound by tradition, and one who has no idea of the value of the beautiful, while the engineer thinks of the town planner as the visionary idealist, with no conception of the practical.

Now, as is often the case, they both have some foundation for their belief—"There is a grain of truth in every error and error in every truth." An intricate problem is not helped by ignoring the ideal. Real estate men have found that the inclusion of attractive topographical features in development plans has added materially to the value of the lots they have to sell. Engineers have discovered that a city plan which has taken primary account of the topography and natural transportation lines provides a far more economical place in which to install public utilities, such as sewers, water, gas, paving and street railways; there are many less duplications—"dead ends." Moreover, the wise application of the principal of zoning to an existing or proposed city literally saves millions of dollars by insuring stability of values.

All the fundamentals of zoning, transportation, sanitation, and topography are handled in detail by engineers. Only the application of topography and the surface treatment of the site are fundamentals of the landscape architect's profession. It appears to be a case of the tail wagging the dog; and the reason is not hard to find. The landscape architect has emphasized beauty and welfare and studied the problem as a whole. The engineer has been inclined to stick to his utility skeleton, forgetting its dress at times, and forgetting human nature. He has not been a good advertiser.

What must the engineer who aspires to plan cities do to regain the ground he has lost to his less widely-experienced brother? The answer seems easy. He must study the question as a whole. He must not only be able to design the sewers or the pavement or the water supply, but must study the relation of these utilities and the population to the physical plan, and taking into consideration that "clothes oft proclaim the man," use the landscape architect to dress up his scheme. He must study topography not merely as an adjunct to one of these divisions, but to all of them; and not study it last, but among the first. He must look at the problem from the real estate man's viewpoint and from the point of view of public welfare and popular appeal. And to do this, he must study zoning, consult with the landscape architect as to beauty, with the architect as to group buildings, and with the statistician, the railway transportation expert, the street superintendent, the marine shipper, the industrial expert, and the social worker.

With the public utilities—where most of the money is spent—he is already an expert; with the rest, which represents, perhaps, not so much an initial direct money outlay as human qualities, he must become familiar. Until he does, he will be only a worker in the field and not a leader.

The public thinks more of engineers these days. It is because more engineers are breaking away from their narrow professional groove and taking their just place in the larger field. In some small degree they are getting into politics in its best sense. Our technical societies are
THE ARCHITECT AND ENGINEER

considering broad public questions and are publishing their opinions. This is good. When the municipal engineer does this he is on his way toward more effective town planning.

Town planning requires close analysis of present and probable future conditions, and strong, competent direction. Hard business sense must be in evidence or the public will solve its problem without the engineers' guidance. So it is up to engineers to see that the public is impressed with the necessity of technical advice.

During the war, the government organized the United States Housing Corporation to build houses for munition workers. This was necessary to enable the great manufacturing and munition plants to obtain and keep labor. An engineer headed this corporation as its president. At first even he did not apparently sense the value of engineering advice in its fullest sense. But as time went on, the small engineering force became more and more powerful. Many complete cities were planned and some partially executed. Eminent architects, landscape architects, and engineers collaborated in the work, but it was very noticeable that the logic of events pushed the engineers to the front, and before the work was completed the engineering force dominated the situation, not entirely so because of the able personnel of the engineering division, but it was because of the irresistible logic of events.

It may be safely stated that every engineer who came into contact with these architects and landscape architects learned a great deal, broadened his horizon, and was a better man for his experience. But it was also strongly impressed on every one of these engineers that even though the bulk of the work (the houses) is architectural work, yet the problem is an engineering one and should be under the direction of an engineer. How much more is this true in city planning when the plan shows little or nothing of the actual house or other building, but goes into detail as to the streets, the traffic, the transportation, sanitation and public welfare as represented by parks, breathing spaces, and zoning.

Engineers Elect Officers

Mr. W. H. Phelps, assistant engineer of the Pacific Coast division of the Southern Pacific Company, has been elected president of the San Francisco Chapter of the American Association of Engineers. Other officers elected for the 1922 term are: Messrs. George Mattis, ex-officio city engineer and superintendent of streets, Oakland, first vice-president; Donald M. Baker, engineer with the State Division of Water Rights, second vice-president; F. J. A. Harber, consulting engineer, treasurer, and Capt. A. J. Capron, retired, construction engineer, secretary.

Engineers Plan Skyscraper

PRELIMINARY sketches have been prepared by Architects J. Martin Haenke and Edward G. Garden (no longer associated) for the proposed Engineering and Industry building to be erected in San Francisco and which will be the permanent home of the following engineering and industrial associations:

San Francisco Electrical Development League.
San Francisco Engineers' Club.
Joint Engineering Council of San Francisco.
San Francisco Section, A. S. M. E.
San Francisco Section, A. I. E. E.
San Francisco Section, A. I. M. E.
San Francisco Section, American Chemical Society.
San Francisco Section, A. M. C. E.
San Francisco Chapter, American Association of Engineers.
California Association of Electrical Contractors and Dealers.
Commonwealth Club.

The building will be from twenty to twenty-five stories and will cost $2,000,000, including the site. A Board of Regents has been appointed to take charge of the enterprise and plans for financing the big project already are well advanced. It is expected that the building will be ready for occupancy during the spring of 1924.
STANLEY

SPECIFICATIONS ON

BALL BEARING BUTTS

DATA:

As a base for lasting high finish, a heavy plating of copper is deposited on polished cold rolled steel, and an additional heavy plating of finish required is placed upon copper base.

Equipped with Stanley non-detachable, weather-protected ball bearing washers. Ball tips have square shoulders flush with knuckle. Ball tip and pin are made in one piece. Pin has the Stanley non-rising and self-lubricating features. This method of lubrication prevents wear on inside of knuckles. Edges and joints are ground perfectly true. Closely fitting joints are obtained by inner edges of leaves being beveled.

Class number (BB239) is stamped upon the back of butt, at top of leaf and near joint. Stanley Sherardized finish (designated by the letter “Z” stamped on leaf near joint) is recommended for exterior use and can be furnished in any plated finish desired.

"Three Butts will prevent the door from warping"

THE STANLEY WORKS
NEW BRITAIN, CONN.

Manufacturers of
Wrought Hardware and Carpenters' Tools

Tear off page and file with your Ball Bearing Butt Specifications.

When writing to Advertisers please mention this magazine.
New Wage Scale of San Francisco Building Crafts

The following shows the new scale of wages for the building industry in San Francisco and the Bay cities, fixed by the wage board of the Industrial Association of San Francisco:

<table>
<thead>
<tr>
<th>Craft</th>
<th>Present Wage</th>
<th>New Wage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asbestos workers</td>
<td>$7.85/-</td>
<td>$7.00</td>
</tr>
<tr>
<td>Bricklayers</td>
<td>$9.25/-</td>
<td>$9.00</td>
</tr>
<tr>
<td>Bricklayers’ hodcarriers</td>
<td>7.40/-</td>
<td>6.00</td>
</tr>
<tr>
<td>Cabinet workers—in shop</td>
<td>8.25/-</td>
<td>7.00</td>
</tr>
<tr>
<td>Cabinet workers—outside</td>
<td>8.35/-</td>
<td>8.00</td>
</tr>
<tr>
<td>Carpenters</td>
<td>8.35/-</td>
<td>8.00 $6.00</td>
</tr>
<tr>
<td>Lathers</td>
<td>8.25/-</td>
<td>8.00</td>
</tr>
<tr>
<td>Electrical workers</td>
<td>9.25/-</td>
<td>8.00</td>
</tr>
<tr>
<td>Eeli.e. fixture hangers</td>
<td>7.40/-</td>
<td>7.00</td>
</tr>
<tr>
<td>Electrical holостmen</td>
<td>8.65/-</td>
<td>7.00</td>
</tr>
<tr>
<td>Elevator constructors</td>
<td>7.85/-</td>
<td>8.00 $6.00</td>
</tr>
<tr>
<td>Engineers—stationary</td>
<td>7.40/-</td>
<td>7.00</td>
</tr>
<tr>
<td>Engineers—traveling crane</td>
<td>8.35/-</td>
<td>7.50</td>
</tr>
<tr>
<td>Engineers—on derricks</td>
<td>8.35/-</td>
<td>8.00</td>
</tr>
<tr>
<td>Glass workers</td>
<td>7.85/-</td>
<td>7.50</td>
</tr>
<tr>
<td>Housecarriers</td>
<td>8.35/-</td>
<td>8.00</td>
</tr>
<tr>
<td>Housewives—Architectural iron</td>
<td>7.40/-</td>
<td>7.00</td>
</tr>
<tr>
<td>Reinforced concrete iron workers—Bridge and structural</td>
<td>7.85/-</td>
<td>7.00 $6.00</td>
</tr>
<tr>
<td>Labor—Common week</td>
<td>6.00/-</td>
<td>4.50</td>
</tr>
<tr>
<td>Laborers—Skilled</td>
<td>6.00/-</td>
<td>5.00</td>
</tr>
<tr>
<td>Lathers</td>
<td>9.25/-</td>
<td>8.00</td>
</tr>
<tr>
<td>Marble setters</td>
<td>7.40/-</td>
<td>8.00</td>
</tr>
<tr>
<td>Marble cutters and copers</td>
<td>6.85/-</td>
<td>7.00</td>
</tr>
<tr>
<td>Marble cutters, headers</td>
<td>6.50/-</td>
<td>6.30</td>
</tr>
<tr>
<td>Marble polishers and finishers</td>
<td>6.00/-</td>
<td>6.00</td>
</tr>
<tr>
<td>Millers</td>
<td>6.00/-</td>
<td>6.00</td>
</tr>
<tr>
<td>Planing mill dept.</td>
<td>7.40/-</td>
<td>7.00</td>
</tr>
<tr>
<td>Sand and door</td>
<td>6.50/-</td>
<td>6.00</td>
</tr>
<tr>
<td>Millwrights</td>
<td>8.35/-</td>
<td>8.00</td>
</tr>
<tr>
<td>Modelmakers</td>
<td>9.25/-</td>
<td>9.00</td>
</tr>
<tr>
<td>Model casters</td>
<td>8.35/-</td>
<td>7.50</td>
</tr>
<tr>
<td>Mason and terrazo workers</td>
<td>7.85/-</td>
<td>7.50 $5.60</td>
</tr>
<tr>
<td>Painters</td>
<td>8.35/-</td>
<td>8.00 $6.00</td>
</tr>
<tr>
<td>Varnishers and polishers (shop)</td>
<td>6.95/-</td>
<td>7.00</td>
</tr>
<tr>
<td>Varnishers and polishers (outside)</td>
<td>8.35/-</td>
<td>8.00</td>
</tr>
<tr>
<td>Plasterers</td>
<td>10.20/-</td>
<td>10.00</td>
</tr>
<tr>
<td>Plasterers’ hodcarriers</td>
<td>8.35/-</td>
<td>7.00</td>
</tr>
<tr>
<td>Plumbers</td>
<td>9.25/-</td>
<td>9.00 $6.00</td>
</tr>
<tr>
<td>Roofers, composition</td>
<td>8.35/-</td>
<td>7.50</td>
</tr>
<tr>
<td>Sheet metal workers</td>
<td>9.25/-</td>
<td>8.50</td>
</tr>
<tr>
<td>Sprinkler fitters</td>
<td>9.25/-</td>
<td>7.20</td>
</tr>
<tr>
<td>Steamfitters</td>
<td>9.25/-</td>
<td>9.00 $6.00</td>
</tr>
<tr>
<td>Silar builders</td>
<td>8.35/-</td>
<td>8.00</td>
</tr>
<tr>
<td>Stone cutters, soft</td>
<td>9.00/-</td>
<td>8.50</td>
</tr>
<tr>
<td>Stone cutters, granite</td>
<td>9.00/-</td>
<td>8.00</td>
</tr>
<tr>
<td>Stone setters, soft</td>
<td>9.00/-</td>
<td>8.50</td>
</tr>
<tr>
<td>Stone setters, granite</td>
<td>10.00/-</td>
<td>8.50</td>
</tr>
<tr>
<td>Stone carvers</td>
<td>9.00/-</td>
<td>8.00</td>
</tr>
<tr>
<td>Stone derricksen</td>
<td>8.35/-</td>
<td>8.00</td>
</tr>
<tr>
<td>Tile setters</td>
<td>8.35/-</td>
<td>8.00 $5.30</td>
</tr>
</tbody>
</table>

Concrete Institute Convention

The American Concrete Institute will hold its annual convention at Cleveland, Ohio, February 13-16. The program, as outlined by the board of direction, after considering the committee reports which are expected to be ready for discussion, will be spread over nine convention sessions—two sessions a day for three days and three sessions on a fourth day. These will be divided as follows: two sessions for contractor problems—the practical problems on the job; two sessions for concrete products manufacturers; one session on roads; one session on houses; one session on research; two sessions on engineering design and inspection.

This Machine Tunnels and Builds Walls

An automatic tunnel-digging machine, the invention of a Philadelphian, is creating considerable interest.

The machine digs a tunnel, removes the earth and places a concrete wall around the excavation almost simultaneously, leaving a finished tunnel, or conduit.

The new machine is now being used to construct an underground conduit at Fifth and Grange streets. Its inventor is Milton Roy Sheen, who worked on the design for five and a half years. He also designed the concrete blocks with which the machine lines the tunnel it digs. The only supplementary work required to start the machine is an excavation sufficiently large to accommodate it.

Aside from greatly expediting and simplifying the work of tunnel and conduit construction, the new machine is said to operate without making it necessary to block or interfere with traffic as is ordinarily the case.

On the present operation, which is proceeding successfully, the machine was run steadily for a stretch of four hours, in which time it constructed eighteen feet of conduit fifty-two inches in diameter. The best run for one hour was five feet eight inches of finished conduit. Mr. Sheen says his machine can be used in the construction of sewer mains, water mains, conduits and tunnels for any purpose up to twelve feet in diameter.

What is considered to be one of the machine’s greatest advantages is that it can operate in residential sections without the residents being made aware of it.—Herald-Examiner.
The Flat Screen
FOR STEEL SASH VENTILATORS

CHEAP + DURABLE + EFFICIENT

Phone for Folder

Michel & Pfeffer
Iron Works
San Francisco, Cal.

Specify and Use
Schroeder
Direct-Flush Valves
for your Toilet Installations

Suitable for any type of building
Adaptable to any style toilet fixture

SOME OF THE TALKING POINTS THAT COUNT:
No rubber or leather parts to wear out
No noise or hammer
Nothing to get out of order

Adjustable to suit the pressure
No corrosion—no leaks
Saves repairs and waste of water

Send for latest circular "B" showing different types of installation

MANUFACTURED BY
STANDARD METALS MANUFACTURING CO.
Main Office and Factory: 1300-1302 No. Main St., LOS ANGELES
San Francisco Office: 16 Steuart Street
AGENCIES: San Diego Portland Seattle Salt Lake City Denver Phoenix

"The Schroeder's Correct—Its Flush Is Direct"

When writing to Advertisers please mention this magazine.
1921 Construction

There was a decided increase in the construction of dwelling houses in this country during the first ten months of 1921, according to information obtained by the Civic Development Department of the Chamber of Commerce of the United States.

Construction figures furnished by forty-four important cities, show that during the period from January to October of the past year about $603,000,000 went into new construction, while during all 1920 the total in the same cities was only $8,000,000 more. During the shorter period last year 57.9 per cent. of the total was for dwelling houses as against only 36.1 per cent. in 1920.

Figures from some of the reporting cities are not brought up to date as it is not universal practice to make monthly reports, and the indications are that the dwelling percentage will be larger when all figures are in, according to the National Chamber's report.

The estimated cost of all construction reported in the forty-four cities for ten months of 1921 exceeds $722,000,000, of which $349,000,000 is residential and $254,000,000 non-residential. Alterations, repairs and special construction cost $119,000,000. Not only would these totals be increased if all reports were up-to-date, according to the National Chamber, but as costs have been reduced, each dollar last year represented an increased volume of construction.

The total estimated cost reported by the same cities for the entire year of 1920 was 798,000,000.

The forty-four cities included in the report, according to the Bulletin of the Associated General Contractors, are:

Birmingham, Kansas City, Mo.
Los Angeles, St. Louis,
Oakland, Camden, N. J.
San Francisco, Jersey City,
Denver, New York City,
Hartford, Manhattan,
New Haven, Brooklyn,
Waterbury, Rochester,
Wilmington, Syracuse,
Washington, D. C. Akron,
Atlanta, Columbus, O.
Kansas City, Kans. Toledo,
Louisville, Oklahoma City,
Baltimore, Portland, Ore.
Boston, Philadelphia,
Fall River, Nashville, Tenn.
Lynn, Dallas,
Boston, Houston,
Fall River, Richmond,
Lynn, Seattle,
Somerville, Spokane,
Springfield, Mass. Tacoma,
Detroit, Minneapolis,
Grand Rapids,

Quantity Surveying

The Architect and Engineer has received a copy of a circular letter being sent to the architects and engineers generally, by Mr. Arthur Priddle, authority on quantity survey, with offices in the Builders' Exchange building, San Francisco. The letter is as follows:

With the discussion regarding Quantity Surveying now going on in view, and especially the article in the December issue of The Architect and Engineer on the subject, I propose a trial of the plan, and hereby offer you a complete bill of materials for bidding on the general construction, or any branch of a medium size job, so that you can hand a copy to the contractors with plans and specifications.

With the plans and specifications and other data you furnish me, please state how many copies of the list you require for use—there need be no limit.

I suggest that you insert in your general specifications, under the heading "Quantity Survey," the following: "The contractor bidding on the project herein described shall be required to submit his estimate of the amount of all alternates for Quantity Surveying, which amount is to be paid over at the direction of the architect when the work is awarded to him. This provision applies and the cash amount is to be paid, as directed, regardless of any change or modification made prior to the award of the work to him."

If this is done the contractor bidding will not be put to any expense for the survey and he will be on an equal quantity basis with others— he can easily check up the work in a short time and you will get all the bids you want with less expense than for prints which is usual. He will also have correct data for figuring the alternates, the place where he usually is weak.

For the protection of the Quantity Survey— the contractor making out the plans and specifications will be required to place a bid and there would seem to be no excuse for his failing to do so and I think it should be impressed upon the contractor that the Quantity Survey is confidential and not to be communicated to anyone—you can see that manipulating the information could work an injustice on the Quantity Surveyor and cheat him out of his legitimate fees.

The contractor cannot object in any manner the owner pays the cost, which is right.

I will confer with you and satisfy you that the survey is complete and as desired before it is issued. Sincerely yours,

ARTHUR PRIDLE.

American Society Civil Engineers

Following are the officers elected by the Los Angeles Section, American Society of Civil Engineers, for 1922:

President, Mr. Ralph J. Reed, chief engineer of construction of Union Oil Company; first vice-president, Mr. F. D. Howell, transportation engineer; second vice-president, Mr. W. H. Code, consulting engineer; treasurer, Mr. E. R. Bow, consulting engineer; secretary, Mr. F. G. Deserry, consulting engineer; directors, Messrs. R. J. Reed, F. D. Howell, W. H. Code, E. R. Bowen, F. G. Deserry, W. K. Barnard, consulting engineer, and H. W. Dennis, chief engineer of construction of Southern California Edison Company.
Philadelphi and Reading Freight Station, Bethlehem, Pa.

WILSON

Standard for Forty-five Years

Rolling Steel Doors

"Underwriters' Label Service"

Prices have been reduced more than reduction in material and labor costs of Wilson products—consistent with our policy of forty-five years in giving each Wilson customer the highest quality and service. Wilson Rolling Steel Doors effect economy in building. Super-strong, durable, fire-proof. Easy to install and operate. Overhead and out of way when not in use, saving valuable floor and wall space. Used in industrial plants, mercantile houses, freight and railroad car sheds the country over.

Strength, as well as fine appearance, gained by Wilson design of Slat construction. Shields protect edges of both sides of door. Safety anchors permanently secure door in groove, offering maximum pressure resistance for minimum groove depth.

Wilson Rolling Wood Doors used wherever metal rolling doors are not applicable—especially in round houses and chemical plants.

Write for circulars. Wilson details and specifications also in Swett's Catalogue.

THE J. G. WILSON CORPORATION

Pacific Coast Office and Factory

621 North Broadway,
Los Angeles, Calif.

Waterhouse-Wilcox Co., San Francisco
Theo. F. Snyder, San Diego
S. W. R. Dally, Seattle
F. W. Farrington & Co., Portland
Walter Dubree, Phoenix
Hawley-Richardson-Williams Co., Salt Lake City

Liquid Carbonic Bldg., Atlanta, Ga., showing Wilson Rolling Wood Doors. J. J. Noy, Chicago, Architect
The Ideal Cement Block is Here

No progressive architect, engineer, contractor or builder can in these days ignore the claims of concrete as a factor of supreme importance to be reckoned with in the general field of construction. Portland cement has long since passed the stage where it was regarded as more or less experimental and suitable only for underground and underwater work. It has entered aggressively the field of general construction, and in spite of the fact that not all its structural applications and systems have yet been standardized, nor all of its problems solved, it has without question "made good" wherever used with proper skill and supervision.

Its possibilities have been demonstrated for bridges, tunnels, pile work, warehouses, office buildings, theatres, residences, and, in fact, every kind of building construction. When concrete first commenced to be popular various manufacturers undertook to produce a cement block machine that would turn out hollow cement blocks for commercial and domestic buildings. The blocks were crude, heavy and insightly. Absence of beams and studs made the cement block wall unsafe and frequent failures caused contractors to discourage the use of hollow blocks, while architects refused to consider them at all on account of their ugliness.

But times have changed, and today it is possible not only to build of concrete blocks with every assurance of safety, but the owner can depend upon having an attractive building when the structure is finished.

A plant has been erected at Modesto for Mr. O. A. Bosley for the manufacture of the so-called Sawyer system pre-cast unit concrete blocks and, although in operation less than two years, the industry has developed to such a point that steps are about to be taken to enlarge the plant and, with abundant financial backing, additional plants will probably be established at convenient points throughout the state. Buildings have been erected according to the Sawyer system in Oakland, Los Angeles, Visalia, Modesto and other cities, some of the satisfied owners being the California Co-operative Canning Association, various Oakland garage dealers, Mr. H. L. Reichsrath of San Leandro and others. An ordinance is now being drafted for the city of San Francisco which will place the Sawyer system within the limits of Class C construction, and the system may also be used for curtain walls in both Class A and Class B construction.

An ordinance was passed in the city of Oakland August 19, 1920, fully covering this construction.

Mr. O. A. Bosley, the manufacturer and builder of these blocks in California, describes the system as follows:

"This system is the invention of Mr. F. McMurray Sawyer, an architect of Los Angeles, California. The two-piece self-locking sectional wall is practically monolithic in construction, with none of the disadvantages of a solid concrete
Vanished Limitations of DRAMA and ARCHITECTURE

FROM its early beginning in Ancient Greece, the drama has had a steady development through the ages. Advance has been apparent with each succeeding century. One by one the early hindrances to realistic portrayal have disappeared. But not until the development of the motion picture have the limitations of time, place and motion been entirely swept away.

Architecture, too, has developed,—from slow and costly construction with hand-carved stone, to the point where even the most beautiful designs of the ancients can be reproduced quickly and economically.

As the presentation of a great dramatic story is made possible by the versatility and range of the screen, by the plasticity of the motion picture to the vision of the director, so the most ambitious architectural project is made possible by the versatility and range of Terra Cotta, by its plasticity to the vision of the architect.

Architects design in Terra Cotta because of its expressiveness, its permanence and its economy in the realization of ambitious designs.

NATIONAL TERRA COTTA SOCIETY is a bureau of service and information. Its publications cover not only the technical and structural use of the material, but show, as well, examples of its application to buildings of various types. Information to meet any specific need will gladly be sent on request. Address National Terra Cotta Society, 1 Madison Avenue, New York, N. Y.
BUNGALOW BUILT IN SOUTHERN CALIFORNIA ACCORDING TO THE SAWYER SYSTEM

THE SAME BUNGALOW AFTER APPLICATION OF EXTERIOR CEMENT FINISH
CONSTRUCTION DETAILS

STORE AND APARTMENT BUILDING, SAN ANSELMO, CAL.
(Sawyer System Pre-cast Unit Concrete Construction)
wall, and is built without the use of wooden forms. The wall consists of two units, namely, the main slab and locking (or key) slab, which are both shaped so that each dovetails into the other, in such a manner, when placed in the wall, that the interlocking part of the slabs form a space which is poured with grout (concrete) and locks the wall together, forming concrete self-aligning studs or columns, every 16 inches for the full height of the wall. These columns can be reinforced if necessary to carry extra heavy loads. The cement slabs form two parallel curtain walls, serving to perfect the construction by forming a hollow wall which is absolutely moisture proof.

"To finish the exterior, a coat of stucco (cement plaster) is applied uniformly on the surface. This is a very satisfactory finish, for the slabs present such uniform surface that the average thickness required is not more than three-sixteenths to one-fourth of an inch. This thin coating, knitting, as it sets, to the concrete slabs, forms a coating which will not crack or check. The coat of stucco, working into the V-shaped grooves produced by the bevel of the slabs, and into the vertical grooves of the stud section, knits the wall together into a solid monolithic mass. The plaster on the interior acts in the same way and requires no furrows or laths.

"Molds as used in this system are made of light wood, with strips and pieces of wood nailed to them so as to form whatever desired shape-unit is wanted. These molds are then stacked or placed together to form a series of multiple cells, each one of which is the mold for a concrete unit. A level floor is used as a pouring place, the molds are stacked vertically, and in accurate alignment and clamped tightly by screw-jack or clamp arrangement. It is common practice to pour the mixture into one row of cells at a time, as rows of molds can be stacked alongside of one another without interference.

"Pouring is done with a wet or slush mixture, and the equipment can be adapted to meet the condition and size of the structure that is to be built. After the molds are filled, they are cured for twelve hours by wet steam. The clamps are then loosened, the segments or concrete units being lifted out and stacked to further cure for three weeks in water, and the molds restacked and poured again. The mixture is of such richness and consistency that the product can, within a very short time, be handled with little or no danger of any breakage occurring.

"The cost of constructing buildings by this system is 20 per cent less than ordinary concrete and brick construction."
Lead Too Pure for Cathedral Roofing
(Congluded from page 107)
they found that the grade of commercial lead used was 99.9 per cent pure, far too pure for satisfactory roofing. They recommended the use of what is technically called "hard lead," which contains approximately six per cent, antimony.

Lead roofs on European cathedrals have lasted for 300 to 500 years, and the metallurgists are of the opinion that lead as manufactured in those days had impurities sufficient to harden it for roofing use.

Sash Chain Company Establishes Coast Agency
Announcement is made by the Smith & Egg Manufacturing Company, originators of metal and steel sash chain, that they have appointed Messrs. Rawlins and Smith their Pacific Coast representatives, with offices at 507 Mission street, San Francisco, and 515 L. W. Hellman building, Los Angeles. Stock will be kept on hand for immediate delivery and orders sent to them will receive prompt attention. Lowest price quotations may be obtained from Messrs. Rawlins & Smith.

Two Quality Types of Steel Sash
The Lupton Steel Sash Company is credited with being the first concern to manufacture two types of sash from solid rolled steel sections. Lupton counterbalanced sash was first used in 1911 and Lupton counterweighted sash in 1912. Recently both types have been improved in detail and modified to facilitate their manufacture in quantity. Both are intended for buildings above the ordinary in quality of construction and in ventilating requirements.

On account of their similarity in construction and general appearance, both types of sash can readily be used in the same building, Lupton counterbalanced sash in the factory portion and Lupton counterweighted sash in the office portion. This is a feature of great value for industrial buildings.

These sash are made with the top and bottom sash of each pair hung over one set of pulleys, so that they open or close simultaneously.

For industrial buildings requiring individually operated windows, Lupton counterbalanced sash is the highest grade and most durable window made.

A revised catalogue on these types of sash is in preparation. Send your request now for a copy to be sent as soon as published.

S. F. Bowser and Richardson-Phenix Companies Consolidate
The Richardson-Phenix Company and S. F. Bowser & Company, Incorporated, announce their consolidation.

The purpose is to improve the service to those who use equipment for the efficient and economical lubrication of all classes of machinery; to combine and apply as a unit the resources for research of both these leading companies; to even more completely embody in the design and manufacture of lubricating apparatus those sound engineering principles that are paramount in an art that must keep abreast of all engineering progress; to cooperate with the builders of machinery and the lubrication engineering world in the solution of the problems met in scien
tific lubrication and the conservation and reclamation of lubricating oils.

The filtration and lubrication appliance business of both companies will be conducted by the Richardson-Phenix Division, S. F. Bower & Company, Inc., with main offices at Fort Wayne, Indiana, to which, beginning immediately, all correspondence should be addressed.

Mr. J. Wm. Peterson, president of the Richardson-Phenix Company, will assume the office of vice-president of S. F. Bower & Company, Incorporated, and will be in charge of the Richardson-Phenix Division. The highly specialized personnel and factories of the Richardson-Phenix Company are retained. The assets of the consolidation are valued at $10,000,000.

Consolidation

Lakewood Engineering Co., of Cleveland, Ohio, have consolidated their Pacific Coast office with those of Smith Booth Usher Company, located at 50-60 Fremont street, San Francisco, and 228-238 Central avenue, Los Angeles.

This really a natural consolidation, as Smith Booth Usher Company have heretofore been exclusive representatives of the Lakewood Engineering Company both in San Francisco and Los Angeles, while Mr. M. B. Rider, manager of the Pacific Coast states for the Lakewood organization, has also maintained an office in San Francisco.

In making this consolidation, Smith Booth Usher Company have acquired Mr. Rider, who has been with the Lakewood organization for a number of years. He will, therefore, be available to answer all calls made on him by contractor friends and acquaintances.

Lakewood equipment is well known in this territory, it having been used on many of our largest construction projects.

The Maricopa County, Arizona, contract for the building of approximately 283 miles of concrete roads, is being built with Lakewood equipment exclusively, and Twohy Bros., contractors, are making a record performance in this work.

Lakewood concrete equipment has been used in the construction of such buildings as the Pacific Mutual and the Pacific Finance buildings in Los Angeles. Also it has been used in the construction of such work as the Sweetwater dam, Barrett dam, Elephant dam, Devils Gate dam, and the San Dimas dam.

New Tile Products—Cold Process

Of interest to every builder and contractor in California and the Northwest is the new patented process for making decorative tile products, now being presented by the Alpha Tile Co., with offices at 170A Golden Gate avenue, San Fran-

The Ball Means Strength, Economy

The Reliance Ball Bearing principle permits the use of "Reliance" at an ultimate cost approximating that of the cheaper device.

RELIANCE Ball Bearing ELEVATOR Door Hangers

Reliance simplicity means quicker and cheaper installation. This saving permits the use of "Reliance" at an ultimate cost approximating that of the cheaper device.

RELIANCE-GRANT ELEVATOR EQUIPMENT CORP'N
Park Ave. and 40th St., New York
PACIFIC COAST AGENTS
Waterhouse-Wilcox Co., San Francisco and Los Angeles, Cal.

Columbia Wire & Iron Works, Portland, Ore.
Specify bare copper wire in your Electrical Specifications?
Of course not.

Your specifications call for good rubber insulated wire that will give protection against fire and accident. And, as further safeguard, protective metal conduits are provided for them.

But, how about the most vital part of your Electrical Installations?
The point of Control—The Switchboard, or Switch?
There is where the greatest danger lurks, and there is where maximum Safety and Protection is necessary. It is the point of necessary contact by the operator and where flashes and arcing occur in the control of the electrical circuits.

Unit Safety Switchboards and Switches
are specially designed to give maximum protection. Their steel clad fire-proof design embody besides the pre-requisite elements of safety, structural features of merit worthy of the investigation of particular Architects and Engineers. — They are neat, compact and efficient, and are built in designs to meet all requirements.

“UNIT” is to the switchboard and switch what rubber insulation and conduit are to the copper wire. Both eliminate accident and fire hazards and reduce insurance cost. Worthy investments.

Our specialized engineering service
is at your disposal.

UNIT ELECTRIC COMPANY
450-460 NATOMA ST.  SAN FRANCISCO, CAL.
cisco, and production plant at 6704 Santa Monica boulevard, Los Angeles. New business conditions now existing have forced every builder to face the problem of reducing expenses. The public demands lower prices and expects more for its money. Tile is now the popular material for mantels, fireplaces, vestibules, store fronts, counters, etc. This cold process enables any contractor to make his own tile without any burning or baking.

The products have been thoroughly tried out and some remarkable tests and recommendations are shown and the tiles are giving the best of satisfaction in homes where they have been installed. The heavy glazed facing is put upon a water-proofed cement base and has many advantages and merits.

There are no restrictions as to color, size or shape and no limit to the beautiful color combinations that can be worked out by the process. They are made to a scale—no checking or warping. They resist stain, and an occasional cleaning with a damp cloth keeps them in their original state. There is an unlimited field for a good product of this kind and its development and use will be watched with interest by builders.

Exclusive manufacturing and sales rights on this process are now being sold responsible contractors.

Mr. Builder
Mr. Contractor
Investigate our Cold Process for making beautiful

Decorative Tile Products
now the popular material for mantels, fireplaces, vestibules, store fronts, counters, etc. By our process you make your own tile as needed and size or color at one-fourth the cost of Burnt Tile; undersell all competition yet make big profits. No burning or baking, no machinery needed. We give you exclusive rights in your territory. We guarantee results. Write today.

ALPHA TILE COMPANY
170 A Golden Gate Ave. San Francisco

RADIANTLIGHT designs are developed to blend with any Architectural scheme. They range from pleasingly plain to the more ornate periods.

RADIANTLIGHT gives you 49 per cent more light on working surfaces than a bare lamp. Enclosed and dust-proof. A permanent highly polished reflector inside the bowl and protected from dust. A reflector which is easily removed and cleaned. A reflector so focused as to direct the light to working plane, without glare. A reflector that directs the light rays as scientifically as the headlight of your automobile. No shadows, rings or spots of light on ceiling.

Demonstrations cheerfully given. Ask your Contractor, Dealer or write.

Electric Appliance Company
807-809 MISSION STREET
San Francisco, Cal.

When writing to Advertisers please mention this magazine.
THE NEW GRANADA
pronounced one of the most beautiful moving picture theatres in the West, is equipped with

"SECO"
D. F. Push Button Panel Boards and Switches

Mr. Alfred H. Jacobs,
the architect of the Granada, says of the installation:
"It's a First Class Job."

Watch future advertisements in this magazine for the story of
D. F. Push Button Panel Boards

SAFETY ELECTRIC COMPANY

Samuel H. Taylor
Proprietor

59-65 Columbia Square
San Francisco, Calif.

NO GERMS HERE

Haws Improved Sanitary Drinking Faucet eliminates all possibility of contracting disease from dirty bulbs or un-sanitary bowls. Provided with an overhead cowl, the drinker's lips never touch the source of supply. A slanting stream throws the water from right to left and away from the bubbler, instead of straight up to fall back over the fountain head. Recommended for Schools and Public Playgrounds. A type used extensively by the U. S. Government. Manufactured by

Haws Sanitary Drinking Faucet Co., Inc.
1808 Harmon Street, Berkeley
Phone Piedmont 3742

Cast Iron Stairs and Store Fronts
Bank and Office Railings, Elevator Enclosures and Fire Escapes.

C. J. HILLARD CO., Inc.

Nineteenth and Minnesota Streets
Telephone Mission 1763

SAN FRANCISCO, CAL.

When writing to Advertisers please mention this magazine.
Seeing the Italian Villas

A pamphlet, “Seeing the Italian Villas,” a reprint of an article appearing in Landscape Architecture for October, 1921, is of more than passing interest to any one anticipating a trip to Italy.

The writer, Leon Henry Zach, has given detailed information as to the location and means of getting into the best examples of villas in or near Rome, Frascati, Tivoli, Florence, Lake Como villas, and many others. To those who have spent much time and often much money in trying in vain to get into Italian villas the notes will be appreciated as an invaluable guide as to the best method of procedure.

No one can really see or feel the spirit of Italy without visiting its great variety of villas, combining the skill of the landscape architect, the architect, the sculptor and often the painter.

A limited number of the pamphlets are available at a charge of fifty cents per copy, by addressing Mr. C. R. Parker, business manager landscape architecture, Brookline 46, Massachusetts.—Wilbur David Cook.

County Hospital Group

Plans are being completed and bids will be called for about March 1st for a group of county hospital buildings at Yreka, Siskiyon county, for which there is available $240,000. The architects are George C. Sellon & Co. of Sacramento. The main building will be of reinforced concrete with terra cotta tile roof.

Factory and Warehouse

Fuller & Goepp, San Francisco wholesale glass dealers, have awarded a contract to MacDonald & Kahn for approximately $40,000 to build a two-story and mezzanine reinforced concrete factory and warehouse at Eleventh and Jackson streets, Oakland.
Good Plumbing for the Factory

Plant of the National Carbon Company, illustrated above, designed by Maurice C. Couchot, C. E., is equipped with special "HAJOCA" Factory Plumbing

Haines, Jones & Cadbury Co.
Makers of Plumbing Supplies
857-859 Folsom Street, San Francisco
Philadelphia-New York-Richmond, Va.-Savannah
Jacksonville-Charlotte

When writing to Advertisers please mention this magazine
IRON AND STEEL PRODUCTS
WAREHOUSE AND MILL SHIPMENTS
STEEL BARS for CONCRETE REINFORCING FURNISHED AND INSTALLED
EDW. L. SOULE CO.
SAN FRANCISCO

SUTTER 2821 RIALTO BUILDING

OCEAN SHORE IRON WORKS
Manufacturers of Boilers, Steel Tanks, Steel Plate Specialties.
Dealers in Boilers, Tanks, Pumps, Engines, Machinery, Etc.

We offer especially the following, subject to prior sale:
Two 80 HP Horizontal Tubular Boilers, 120 lbs. working pressure.
Two 100 HP Heine Safety Water Tube Boilers, 130 lbs. working pressure.
Ten 250 HP Marine Heine Water Tube Boilers, 175 lbs. working pressure.

Prices on application—send us your inquiries.
Office and Works: 550-558 EIGHTH STREET Telephone Market 462 SAN FRANCISCO, CAL.

The DUNHAM HEATING SERVICE

DUNHAM SPECIALTIES
Packless Radiator Valves
Radiator Traps
Drip Traps
Blast Traps
Air Line Valves
Vacuum Pump Governors
Reducing Pressure Valves
Oil Separators
Suction Strainers
Air Vents
Return Traps
Check Dampers
Damper Regulators

Complete Bulletins and Data for the asking
C. A. DUNHAM COMPANY
Los Angeles San Francisco Seattle
Portland Spokane
Administrative and General Offices: Chicago, Ill.

SERVICE TESTING INSPECTION CONSULTATION PRODUCTION
Structural and Engineering Materials
Robert W. Hunt & Co. Engineers
Chemical and Physical Testing Laboratories
New York Chicago Pittsburgh
St. Louis San Francisco Mexico City
London Montreal

When writing to Advertisers please mention this magazine.
A very effective employment of simple soldier and rowlock courses for the embellishment of the wall surface. Note especially the treatment of the broad belt course at the second story.

A Portfolio of Architectural Details in Brickwork

As the architect is desirous of having conveniently at hand illustrations of beautiful brickwork, the American Face Brick Association has prepared an enclosed folder, file size with printed tab, which at present contains thirty-two de luxe half-tone plates of the finest types of brickwork.

These examples cover a wide range of interior and exterior subjects, and will be useful in the drafting room for suggesting many interesting methods of treating the wall surface. This portfolio will be added to from time to time with further examples, with data on brick, and its uses, and with monographs on the treatment of the mortar joint in connection with the blending of the brick color tones.

A set of these plates in the folder will be sent to any architect requesting them on his office stationery, and his name will be placed on the list for future mailings.

AMERICAN FACE BRICK ASSOCIATION
1159 WESTMINSTER BUILDING - CHICAGO, ILLINOIS
A CORN BRAND OAK FLOORING for discriminating Architects and Builders, and characteristically a Tennessee product in every way, from the excellence of the wood itself to the superior millwork and careful grading.

Strable Hardwood Co.
HARDWOOD LUMBER
Phone, Oakland 245
511-545 FIRST STREET OAKLAND, CAL.

Bay State Protection
The architect's ideas of beauty are faithfully carried out by Bay State Brick and Cement Coating. And it protects the buildings he creates. It makes all buildings of brick, cement and stucco proof against sun, rain, and dampness. Many leading architects specify Bay State. Write for samples in white and colors and booklet No. 43.

Wadsworth, Howland & Co., Inc.
Paint and Varnish Manufacturers
Boston, Mass.

JAMES HAMBLY & SON, Representatives
SAN FRANCISCO LOS ANGELES
BAY STATE
Brick and Cement Coating

When writing to Advertisers please mention this magazine.
Sawyer System *Pre-Cast-Unit* Concrete Construction

**CONSTRUCTION DETAILS.**

Showing system of wall design with foundation and roof plates erected. Studs and roof plate are shown poured and reinforced. Window sashes and floor joists in place.

Plaster applied on interior of wall.

**O. A. BOSLEY**

*Manufacturer and Builder*

Office and Plant, 1501 Ninth Street, Modesto, California

Old Mission Portland Cement Used Exclusively in the Sawyer System of Concrete Construction
The Granite Work on Eldorado County Courthouse; National Bank of D. O. Mills, Sacramento;—
and Sen. Nixon Mausoleum, Reno, WAS FURNISHED BY

**CALIFORNIA GRANITE COMPANY**

**STONE CONTRACTORS**

Phone Sutter 2646
Builders' Exchange, San Francisco
Quarries, Rocklin and Porterville

Main Office, Rocklin, Placer Co., Cal.
Telephone Main 82

---

**LAWTON & VEZEY**

**CONTRACTORS AND BUILDERS**

332 CALL BUILDING
SAN FRANCISCO

306 PLAZA BUILDING
OAKLAND

---

**CHAS. STOCKHOLM & SONS**

**GENERAL CONTRACTORS**

849 MONADNOCK BUILDING
Phone DOUGLAS 4657
SAN FRANCISCO

---

**HOT WATER ELECTRICALLY**

**ALL YOU WANT**

**THERM-ELECT WATER HEATER** for APARTMENT HOUSES, RESIDENCES, ETC.

**ELECTRIC SALES SERVICE COMPANY**

2532 Sixth Street, BERKELEY
Phone Berkeley 3070

---

**JOHN M. BARTLETT**

**GENERAL CONTRACTOR**

Office
357 - 12th ST., OAKLAND

Phone Lakeside 6750
Res. Phone Berkeley 6884W

---

**LARSEN-SIEGRIST CO., Inc.**

**BUILDING CONSTRUCTION**

807 Claus Spreckels Building
SAN FRANCISCO

---

Shop and Compare—that's the only true test of values.
Furnishings for the home of distinctive style are featured is this shop at prices that will bear the strictest comparison.

Furniture  Draperies  Floor Coverings  Interior Decorations

---

**Motors**

Bought, Sold, Rented, Repaired

**Lighting Fixtures**

Manufactured

**Construction**

Maintenance Supplies

**SPOTT ELECTRICAL CO.**

16th and Clay Streets
Oakland, California
THE BEAUTY, COMFORT AND EVENTUAL ECONOMY OF CLAY PRODUCTS MANUFACTURED BY L. A. P. B. COMP'Y HAVE NEVER FAILED TO JUSTIFY THE CHOICE OF THE ARCHITECT OR BUILDER WHOSE FINE JUDGMENT SELECTED THESE MATERIALS

L. A. Pressed Brick Co. Clay Products

Face Brick
Terra Cotta
Hollow Tile

Kushequa Quarry Tile
Clay Tile Roofing

Flue Lining
Chimney Pipe
Mortar Colors

"The Standard of Quality in Clay Products"

L. A. Pressed Brick Co.
Entire Sixth Floor Frost Building, Los Angeles

UNITED MATERIALS CO.
Distributors for Northern California
Sharon Building, San Francisco

When writing to Advertisers please mention this magazine.
Were You Ever in Brown's Fix?

Brown was a moderately thriving architect and engineer, and it meant a great deal to him to have a shy at the big Hatfield & Cummins project.

While the development work he had handled stood very much to his credit, still he had never been connected with any construction of sufficient importance to bring his name into real prominence.

Naturally there was a great commotion when the phone rang and Hatfield's voice came over the wire:

"Mr. Brown, we have to go ahead on the extension of our new installation at once. Bring over a contract form by noon, guaranteeing your telephone estimate of November 8th and we will sign with you.

Brown clapped down the receiver. He was a made man!

The Hatfield & Cummins patronage meant connections and prestige that would convert him into a formidable competitor for all sorts of big propositions.

But in five minutes he had lost ten years of his optimism. The estimate was not to be found. He remembered perfectly having carefully put it away where he could readily find it—although the thought of having a swing at the big job had never really grazed him.

It was too late to refigure the estimate—it must be found. In a mad scramble, Brown and his office helpers went pawing over everything in the office—but no result. Brown hasn't found that estimate yet although he gave up looking for it long ago.

His concern was not converted into prominence overnight. In the absence of an efficient filing system they had lost out in the big opportunity of years.

But Brown did not have to stub his toe twice to find out the trouble. He came into H. S. Crocker Company and told his story.

"Gentlemen," he said, "what can you do for me that will prevent a thing of that kind ever happening in my business again?"

He was shown the possibilities of the Globe-Wernicke Filing Cabinet for his particular office and requirements. He learned how he could have saved a large order for his business, and how in the future he would always be able to put his finger on any piece of correspondence or office data he chose no matter when it might be needed.

Needless to say, Brown's office has been reorganized for future protection and efficiency.

H. S. Crocker Co., Inc.

565-571 Market Street, San Francisco

Los Angeles  1444 Broadway, Oakland  Sacramento
A refrigerator of enameled "Armco" Ingot Iron has the sheer, beautiful gloss of fine porcelain. The surface is smooth and unbroken by "pin-holes," bubbles, or lumps.

This is due to the purity of the iron base. By special processes of manufacture, "Armco" Ingot Iron sheets are purified of foreign matter that is found in all iron ore and in the other metals used. Thus the tiny atoms of iron are closer together, the texture is uniform, and the enameling grips with the maximum adherence. There is no tendency of the enamel to split, crack, or flake.

When buying a refrigerator, a stove, a washing machine, or an enameled table top, ask the salesman if it is made from "Armco" Ingot Iron. Look for the blue and gold Armco triangle, which manufacturers are glad to place upon such products.

THE AMERICAN ROLLING MILL CO.
MIDDLETOWN, OHIO

An ample supply of ARMCO stock is carried in the San Francisco warehouse, Tenth and Bryant streets. Other branch offices in New York, Pittsburg, Cleveland, Detroit, St. Louis, Cincinnati, Atlanta, Washington and Buffalo.
THE TORMEY CO.

General Painters

Phone Franklin
5-5-9-8

1042 Larkin St., San Francisco, Cal.

Alvaline, Cementoline
and other
Jones-Duncan Products

MAGNER BROTHERS
PAINT MAKERS

Telephone: Market 113
414-424 Ninth St. San Francisco

HEATING PLUMBING

COMPLETE PLUMBING AND HEATING SYSTEMS INSTALLED IN ALL CLASSES OF BUILDINGS ALSO POWER PLANTS

GILLEY-SCHMID CO., Inc.

198 OTIS STREET, SAN FRANCISCO.
Tel. MARKET 965

‘BLAZING’ THE TRAIL

We’ve been doing it for many years—giving the Sportsman Better Value for Quality than he ever before received. “Value at a Fair Price” in everything for the Sportsman.

BEEVER BLACKBOARD
BEAVER GREENBOARD

SCHOOL FURNITURE
AND SUPPLIES—
OFFICE, BANK AND COURTHOUSE FURNITURE—
THEATRE AND AUDITORIUM SEATING

Rucker-Fuller Desk Co.
677 Mission St., SAN FRANCISCO, CAL.
434 Higgins Bldg., LOS ANGELES, CAL.
432 - 14th Street — OAKLAND, CAL.

Pittsburgh

It Insures Instant Hot Water Service

PITTSBURG WATER HEATER COMPANY
478 Sutter St., San Francisco
Phone Sutter 5025

Russwin

BUILDERS’ HARDWARE
JOOST BROS., Inc.
SAN FRANCISCO AGENTS.

We Carry Complete Stock:
Fishing Tackle—Guns—Mechanics’ Tools—
Paints—Crockery and Glassware—Stoves—
Household Goods. Telephone Market 891.

NO BRANCH STORE
Mazda Lamps Electric Goods

When writing to Advertisers please mention this magazine.
GOODS OF QUALITY

A new syphon action closet at a moderate price that is not only ultra-efficient but pleasing in appearance and combining many new sanitary features.

On display at our show room—

64 Sutter Street, San Francisco
Main office and warehouse: Sixth, Townsend & Bluxome Sts.

Holbrook, Merrill & Stetson

VICTORY-FORSTER
Sanitary Water Closet Waste Connections

These fittings have been used and specified by the leading Plumbers and Architects for a great many years.

Thousands of buildings on the Pacific Coast are supplied with them.

REMEMBER THESE FACTS

(1). These fittings are absolutely sanitary.
(2). No wiped lead joints required.
(3). Can be used under six-inch joists.
(4). Each fitting comes with a patented testing cap in the flange which saves money and time over the old method of soldering on lead test cap.
(5). They can be installed in one-tenth of the time of other fittings.

SOLD BY ALL PLUMBING JOBBERS
Approved by BOARDS OF HEALTH of the Leading Cities

MANUFACTURED BY

VICTORY MANUFACTURING COMPANY
Sales office 423½ Monadnock Bldg., SAN FRANCISCO
Factory Niles, Cal.

When writing to Advertisers please mention this magazine.
A. D. COLLMAN

COLLMAN AND SPEIDE/L
GENERAL CONTRACTING
Telephone SUTTER 4858

P. F. SPEIDEL
CONSTRUCTION ENGINEERS
MONADNOCK BUILDING, SAN FRANCISCO

I. R. KISSEL
Decorator, Painter and Paperhanger
1747 SACRAMENTO ST., Bet. Polk St. and Van Ness Ave., SAN FRANCISCO

ROBERT TROST
General Building Contractor
We Specialize in High Grade Work and Employ Skilled Labor in every Branch of the Building Industry.
26th and Howard Streets
SAN FRANCISCO

P. A. PALMER
Contracting Engineer
782-796 Monadnock Building
SAN FRANCISCO, CAL.

LOUIS FONTANELLA, Phone Mission 8923
MARK TEZA, Phone Valencia 1623
FONTANELLA & TEZA
General Contractors
Telephone West 1285
1682 Eddy Street, San Francisco

MONSON BROS.
Building Construction
Yard
Mariposa and Bryant Streets
Phone Market 2693
251 Kearny Street, San Francisco
Phone Douglas 6619

UNIT CONSTRUCTION COMPANY
(INCORPORATED)
ENGINEERING AND CONSTRUCTION
Telephone Kearny 28
429-36 Phelan Building, SAN FRANCISCO

J. D. HANNAH
Contractor and Builder
OFFICE: 142 Sansome Street
San Francisco, Cal.
Telephone Douglas 3895
BUILDERS EXCHANGE, 180 JESSIE STREET
NOT only will a Kennedy Valve give satisfaction right now, but it will continue to give good service for a long period of years. The Kennedy Valves you specify today will still be in the service of your clients five, ten and twenty-five years hence.

Kennedy Valve records extending through almost half a century of uninterrupted service testify to the long-time satisfaction that can be expected of the Kennedy of present-day improved design.

Ask us to send you the Kennedy Catalog describing in detail the 500 different types and sizes of Kennedy Valves and explaining the special Kennedy features.

Look for this Trademark

And if it's there don't worry any more about your Valves and Fittings

The Kelly & Jones Co. Valves and Fittings
Byers Genuine Wrought Iron Pipe
Republic Steel Pipe

Complete Line of Plumbing Supplies
Large Stocks for Prompt Delivery
Catalogue on request

California Steam & Plumbing Supply Co.
671-679 Fifth Street, Corner Bluxome
SAN FRANCISCO, CALIFORNIA

When writing to Advertisers please mention this magazine.
K. E. PARKER COMPANY, Inc.
GENERAL CONTRACTORS

R. W. LITTLEFIELD
Building Construction
357 12th Street, Room 9, Oakland, Cal.

H. H. HILP, Jr.
J. FRANK BARRETT
B AR R E T T & H I L P
CONCRETE CONSTRUCTION BUILDERS GENERAL CONTRACTORS
918 HARRISON STREET, near 5th, SAN FRANCISCO
Telephone DOUGLAS 700

CAEN STONE
A refined, elegant, interior finish.

A. KNOWLES
CONTRACTOR and PLASTERER
442 Call-Post Building
San Francisco

STEELFORMS Signify ECONOMY, RAPIDITY, and EFFICIENCY
STEELFORM CONTRACTING COMPANY
STEELFORMS FOR CONCRETE BUILDINGS
C. B. Hopkins, C. E., Manager
681 Market Street, San Francisco

HILL, HUBBELL & CO.
Manufacturers and Roofing Contractors
115 Davis Street
San Francisco
Los Angeles Seattle Portland New York

M. E. VUKICEVICH
VUKICEVICH & BAGGE
GENERAL CONTRACTORS
Phone Sutter 6700
Office, Builders Exchange, 180 Jessie St., San Francisco
<table>
<thead>
<tr>
<th>Name</th>
<th>Address</th>
<th>Phone</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Standard Fence Co.</strong>&lt;br&gt;WIRE AND IRON WORKS</td>
<td>320 North Los Angeles Street, Los Angeles, Cal.</td>
<td>Phone 67188</td>
</tr>
<tr>
<td><strong>Steel Bars</strong>&lt;br&gt;BADT-FALK &amp; CO.</td>
<td>346 Call-Post Bldg., 74 New Montgomery St., San Francisco</td>
<td>Phone 3466</td>
</tr>
<tr>
<td><strong>ATHERLEY BROS.</strong>&lt;br&gt;PAINTING AND DECORATING&lt;br&gt;WINDOW SHADES MADE TO ORDER</td>
<td>2032 Polk Street, San Francisco</td>
<td>Phone Prospect 83</td>
</tr>
<tr>
<td><strong>MARTEN &amp; FREDERICK</strong>&lt;br&gt;UNITED WORK SHOPS</td>
<td>1374 SUTTER ST., SAN FRANCISCO</td>
<td>Phone FRANKLIN 689</td>
</tr>
<tr>
<td><strong>GRIFFIN SHEET METAL WORKS</strong>&lt;br&gt;1720 H STREET FRESNO, CALIFORNIA</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| **HERBERT BECKWITH**<br>Building Construction | 323 Newton Ave. | Phone 3600
Oakland |
| **D. ZELINSKY & SONS**<br>PAINTERS AND DECORATORS | 420 TURK STREET, | Phone 83 |
| **CHARLES T. PHILLIPS**<br>CONSULTING ENGINEER | PACIFIC BUILDING HEATING VENTILATION WIRING ILLUMINATION | Phone 3600 |
THE ARCHITECT AND ENGINEER

Geo. T. Fletcher       Geo. P. Schmitt       E. L. Fletcher
PACIFIC HEATING COMPANY
Heating, Ventilating and Sheet Metal Work
Coal, Wood, Oil and Gas Heaters to Meet all Requirements
We Repair All Makes of Heating Appliances
WORK GUARANTEED          Oakland 398    Corner Second and Grove Streets, OAKLAND, CALIF.

Atlas Heating and Ventilating Co., Inc.
ENGINEERS and CONTRACTORS
STEAM AND HOT WATER HEATING, FANS, BLOWERS, FURNACES, POWER PLANTS—SHEET METAL WORK
Phone Douglas 378    Fourth and Freelon Sts., Bet. Bryant & Brannan, SAN FRANCISCO

JAS. I. KRUEGER
Representing Illinois Engineering Company, Chicago
Eureka Brass Works, Cincinnati
Manufacturers of Vacuum and Vapor Steam Heating Materials, Power Plant Equipment
Standard Radiator and Gate Valves, Pumps for Vacuum Systems of Heating
557-559 Pacific Building, San Francisco    Telephone Sutter 7057

HEATING FLOOR AND WALL TILING PLUMBING VENTILATION SHEET METAL WORK
SCOTT CO., INC.
SUCCESSOR TO JOHN G. SUTTON CO.
243 MINNA STREET
SAN FRANCISCO

ALEX COLEMAN
CONTRACTING PLUMBER
706 ELLIS ST., SAN FRANCISCO    Phone FRANKLIN 1006

WM. F. WILSON COMPANY
MODERN SANITARY APPLIANCES
Special Systems of Plumbing for Residences, Hotels, Schools, Colleges, Office Buildings, Etc,
Phone Sutter 357    328-330 Mason Street, San Francisco.

W. H. PICARD, Sanitary Plumbing and Heating
F. J. EDWARDS, Heating Engineer
5656 COLLEGE AVENUE, OAKLAND    Phone: Piedmont 7522

Telephone West 2002

THOS. BRODIE, Plumber
TINNING, ROOFING and CHIMNEY TOPS
Automobile Service Carrying All Repairs
2119 FILLMORE STREET (near California)    -    -    -    San Francisco
The Nation's Housing Conditions Demand ECONOMY in Building

Economy in expense and economy in space. Portal Wall Beds are timely space and cost savers meeting this national need. Everywhere architects and contractors who build wisely plan their apartments with

PORTAL WALL BEDS

MARSHALL & STEARNS CO.

WALL BEDS

"Highest Award Always"

Crescent Apartments, Ellis and Hyde Streets, San Francisco
Equipped with WALL BEDS
1152 Phelan Building
San Francisco
1774 Broadway
Oakland

MOORE SHIPBUILDING CO.

Fabricators of

STRUCTURAL STEEL BUILDINGS - BRIDGES

Large Stock of Shapes and Plates
MANUFACTURERS OF
Rivets and Machine Bolts

Oakland Office and Plant
FOOT OF ADELINE STREET
PHONE LAKESIDE 5180

San Francisco Office
310 BALFOUR BUILDING
PHONE KEARNY 5248

When writing to Advertisers please mention this magazine.
Superintendent of Construction
Specifications and Estimates
JOHN E. HAMILTON

Cabot's
Old Virginia White

A Soft, Brilliant White for Shingles, Siding and Similar Woodwork. As Bright and Clean as New Whitewash, and as Lasting as Paint.

Architects and others have tried for years to get a paint that would give the same beautiful, brilliant white as new whitewash, and would also be durable and clean and not rub off like whitewash.

But paint was always "painty" — hard, cold and heavy. Old Virginia White is a shingle-stain compound that has solved the problem. It is as clean, cool and brilliant as fresh whitewash, and as lasting as paint; but it is not messy like whitewash, nor painty like paint, although it costs less and goes farther than paint.

Send for Sample Shingle and Circular showing other fine houses finished with Old Virginia White


Cabot's Creosote Stains, Stucco and Brick Stains, "Quilt," Mortar Colors, Dampproofing, Waterproofings, Conservo Wood Preservative, etc.

Pacific Materials Co., San Francisco
The Waterhouse-Wilcox Co., Los Angeles
S. W. R. Daily, Seattle
Theo. F. Snyder, San Diego, Cal.

When writing to Advertisers please mention this magazine.
Arden Plaster

Now available in any quantity desired for immediate delivery.

For further information call on your dealer or

A. R. Robertson
Builders' Exchange
180 Jessie St.  San Francisco

Manufactured by

United States Gypsum Co.

DORITE
MAGNESITE
STUCCO
FLOORING
TABLE-TOP
INTERIOR
PLASTER

Manufactured by the

Dorite Manufacturing Co.
116 UTAH STREET
SAN FRANCISCO

METROPOLITAN BLDG.
LOS ANGELES

501 FIFTH AVE.
NEW YORK

The General Fireproofing Company

Manufacturers of Herringbone Rigid Metal Lath, Corner Bead, Self Sentering, Peds, Diamond Mesh Lath, and waterproofing materials for Concrete

Write for booklet describing, and answering every possible question you may ask concerning the use of fireproof and waterproof materials

No. 20 Beale Street
San Francisco

Telephones Douglas 6616  Piedmont 4955 W.

Complete Protection with Service at Cost

is furnished by the oldest, largest, and strongest mutual casualty company in America.

Workmen's Compensation Insurance
Employers' Liability Insurance
Automobile Liability Insurance
Also Other Forms of Liability Insurance

Send for your copy of the booklet "30-30," which tells the whole story

San Francisco Office, 816-817 Balboa Bldg.
GEORGE W. LINCH, District Manager

AMERICAN MUTUAL
Liability Insurance Company
295 State Street, Boston, Mass.

When writing to Advertisers please mention this magazine.
POSITIVE ELECTRIC INTERLOCK
(BAR LOCK TYPE)
Prevents Elevator Accidents Occurring at the Entrance Door
Approved by National Underwriters Laboratories—Meets requirements of Elevator Safety Orders of
Industrial Accident Commission, State of California
ELEVATOR SUPPLIES COMPANY, Inc. 186 FIFTH STREET, SAN FRANCISCO

Capital $2,000,000  CALIFORNIA DEPARTMENT Surplus $2,250,000
THE FIDELITY AND CASUALTY COMPANY OF NEW YORK
Prompt Service for
BONDS AND CASUALTY INSURANCE
BALFOUR BUILDING  SAN FRANCISCO, CAL.

National Surety Company of New York
The World's Largest Surety Company  Assets over $20,000,000
Pacific Coast Department: 105 MONTGOMERY ST., SAN FRANCISCO, CAL.
Frank L. Gilbert, Vice-President  Phone, Sutter 2636

PACIFIC DEPARTMENT
Globe Indemnity Company
BONDS and CASUALTY INSURANCE for CONTRACTORS
FRANK M. HALL, formerly Robertson & Hall, Mgr.
444 California Street  Phone Sutter 2280  SAN FRANCISCO

PHONE DOUGLAS 2370
R. McLERAN & CO.
GENERAL CONTRACTORS  SAN FRANCISCO, CAL.
HEARST BUILDING

S. G. JACKSON
Building Construction
Office, 351 12th Street, Oakland  Residence, 1098 Ranleigh Way
Lakeside 6750  Lakeside 3373

PHONE SUTTER 1533
ALFRED H. VOGT
GENERAL CONTRACTOR  CONCRETE CONSTRUCTION
185 Stevenson Street, San Francisco

J. F. WAYNE  Phone Fillmore 1836
Phone West 4011  R. C. WILLIAMS  Phone West 4168
Wayne & Williams
Painting Contractors  1621 Eddy St., San Francisco
Paper-Hanging and Interior Decorating
OPEN HEARTH

Reinforcing Steel Bars

Square Deformed — Immediate Shipment — Cut to required lengths

PACIFIC COAST STEEL COMPANY
Sales Office, Rialto Building. SAN FRANCISCO. Phone Sutter 1564

SUNSET HICKS-JUDD PRESS
ABBOTT-BRADY PRINTING CORPORATION
San Francisco

Builders of Complete Catalogs

460 Fourth Street & Douglas 3140

We supply reprints of THE ARCHITECT AND ENGINEER advertisements for circularizing

George S. MacGruer { Members of Builders Exchange
Robert M. Simpson

MacGruer & Simpson

CONTRACTING PLASTERERS
PLAIN AND ORNAMENTAL
Cement, Stucco and Artificial Stone

Phone Sutter 5688 540 Call-Post Building, San Francisco

NATIONAL WINDOW SHADE COMPANY, Inc.

Agents for BRENLIN
The Long Wearing Window Shade Material
National Shades wear twice as long as the ordinary kind

Phone Franklin 552 244 EDDY STREET, SAN FRANCISCO, CAL.

When writing to Advertisers please mention this magazine.
MORTENSON CONSTRUCTION CO.
CONTRACTORS FOR STRUCTURAL STEEL AND IRON
H. MORTENSON, PRESIDENT
OFFICE AND SHOPS: CORNER 19TH AND INDIANA STREETS
SAN FRANCISCO, CAL.

RAYMOND GRANITE COMPANY, Inc.
Owning and operating at Knowles, Madera County, the largest Quarry in the world
CONTRACTORS FOR STONE WORK
Designers and Manufacturers of Exclusive Monuments and Mausoleums
Main Office and Yard: No. 1 and 3 Potrero Avenue, San Francisco, California
Also at 1350 Palmetto Street, Los Angeles

Federal Ornamental Iron & Bronze Co.
Bank Counter Screens and Grille Work Our Specialty
Most Modern Equipment Throughout
Recent Contracts: BANK OF ITALY, FIRST NATIONAL BANK
16th Street and San Bruno Avenue, San Francisco
Phone Market 1011

L. J. RUEGG
RUEGG BROS.
CONTRACTORS AND BUILDERS
Phone Douglas 1599
719 Pacific Building, SAN FRANCISCO

CENTRAL IRON WORKS, Inc.
STRUCTURAL STEEL
Office 2050 BRYANT STREET
SAN FRANCISCO, CAL.

C. S. HOFFMAN
Golden Gate Iron Works
STRUCTURAL STEEL AND ORNAMENTAL IRON CONTRACTORS
Howard and 11th Streets
San Francisco

SCHRADER IRON WORKS, Inc.
STRUCTURAL STEEL CONTRACTORS
Fire Escapes, Waterproof Trap Doors, Ornamental Iron Work
1247-1249 HARRISON STREET
SAN FRANCISCO, CAL.
Telephone Market 337
THE HYLOPLATE BLACKBOARD

SCHOOL FURNITURE
AUDITORIUM SEATING

MAPS
GLOBES
ATLAS

C. F. WEBER & CO.
985 Market Street
SAN FRANCISCO

222-224
S. Los Angeles St.
LOS ANGELES

100 W. Commercial
Row, RENO, NEV.

524 W. Washington
Street, PHOENIX, ARIZ.

BEAUTIFUL GARDEN
EFFECTS for the City
and Suburban Home

MacRORIE-McLAREN CO.

Landscape Engineers
and General Nurserymen

Office
141 Powell Street
San Francisco

Nurseries at
Beresford,
San Mateo County

TRANSMISSION EQUIPMENT
For Mill or Factory

Pullies - Sheeting - Gears
Hangers - Bearings - Take Ups
Spragets - Clutch discs - Chain Bolts
Floor Glands - Bolt Tighteners - Rope Sheaves

Meece & Gottfried Company

Transmission Equipment

CRANE
CAST IRON
BRASS
CAST STEEL
FERROSTEEL

FLANGED FITTINGS
We have the largest line of patterns for flanged fittings for low pressure, standard, extra heavy, hydraulic, superheated and extreme hydraulic pressures, ranging in size from one-inch to sixty-inch, and for working pressures from fifty pounds to three thousand pounds.

The dimensions of the low pressure, standard and extra heavy fittings are in accordance with the 1915 American Standard.

Castings for special fittings also may be made at a minimum expense owing to our large equipment of special patterns which may be altered at very low cost.

CRANE CO.
PLUMBING SUPPLIES

2nd and Bran-
nan Sts., SAN
FRANCISCO,
348 9th Street
OAKLAND

When writing to Advertisers please mention this magazine.
Western Safety Switches
Manufactured by
Western Safety Man'fg. Co. Inc.
Enclosed Externally Operated Safety Switches, Knife Switches, Metal Switch and Cut Out Boxes, Safety Switch Boards
Office, 247 Minna Street  SAN FRANCISCO
Telephone, Sutter 3008

MEYERS SAFETY SWITCH CO.
MANUFACTURERS OF
Enclosed Externally Operated ‘Safety’ Switches and Electrical Sheet Metal Products
575 HOWARD ST., SAN FRANCISCO
Telephone Sutter 4213.

BUTTE ELECTRICAL EQUIPMENT COMPANY
Trade Mark BEECO Registered
ELECTRICAL CONTRACTORS AND ENGINEERS
530 FOLSOM STREET  SAN FRANCISCO

Drendell Electrical & Mfg. Co.
Incorporated
SWITCHBOARDS, PANEL BOARDS, KNIFE SWITCHES, CABINETS, THEATRE INSTALLATIONS, PROTECTIVE POWER PANELS
1345-1353 Howard St., San Francisco Telephone Market 1753
BUTTE ELECTRIC & MFG. CO.
ELECTRIC BANK PROTECTION SYSTEMS
WIRING FOR BUILDINGS
534 FOLSOM ST.
SAN FRANCISCO

H. S. TITTLE
CONTRACTING ELECTRICAL ENGINEER
766 FOLSOM ST., SAN FRANCISCO
Phone SUTTER 4278

To Be "Low Bidder" Not Always Our Aim.
Our most particular attention is given to prompt and skillful handling of all electrical work of any nature with "QUALITY AND SERVICE GUARANTEED."
Our nation-wide organization and large experience in this field assures you always of fair estimates and absolute satisfaction.
F. E. NEWBERY ELECTRIC CO.
359 Sutter Street, San Francisco
Phone Sutter 521

San Francisco, Cal. Oakland, Cal. Los Angeles, Cal.
NE PAGE, McKENNY CO.
Electrical Engineers and Contractors
Phone Sutter 2369 589 Howard St., San Francisco, Cal.

Phone Market 2541
GLOBE ELECTRIC WORKS
Estimates Furnished on Everything Electrical
ELECTRIC SUPPLIES
1959 Mission Street, bet. 15th and 16th
SAN FRANCISCO

Browne-Langlais Electrical Construction Co.
Agents for
ROBBINS and MYERS MOTORS PACKARD MAZDA LAMPS
313 FIFTH STREET, SAN FRANCISCO
Telephone Douglas 976

G. WALTER SPENCER, Manager
Phone Lakeside 6759
SPENCER ELECTRIC CO.
CONTRACTING AND ENGINEERING
355 TWELFTH STREET
OAKLAND, CALIF.

M. E. RYAN
Electrical Contractor and Dealer
520 Clunie Building, San Francisco
Phone Garfield 3159
The Elevator Floor
whether in Office Building, Hotel or Department Store, is subjected to a great deal of wear and tear.

—SPECIFY—
INTERLOCKING RUBBER TILING
and you've provided your client's building with a Durable, Economical, Practical, Twenty tons
installed in the Standard Oil Building, San Francisco. Stock on hand for immediate delivery.

New York Belting and Packing Co.
NEW YORK
San Francisco Branch 519 MISSION ST. Phone Douglas 1837
Small booklet of designs mailed on request.

GENERAL BOILERS COMPANY

General Office and Plant:
WAUKEGAN, ILLS.

Manufacturers of
“PACIFIC”
STEEL HEATING BOILERS
AND
CIRCULATING TANKS

DEPARTMENT OF SALES:
322 MONADNOCK BUILDING, SAN FRANCISCO.
Telephone Sutter 4665

When writing to Advertisers please mention this magazine.
QUALITY PRODUCTS
Proven by the Test of Time

MORAN'S PRESERVATIVE PAINTS
Genuine Preservative Paints for Every Use. Will positively preserve iron, steel, wood, concrete, roads, piles, poles, railroad ties and all wood or metal surfaces above or below earth or water.

A. W. CADMAN MFG. CO.
Cadman Valves.
The Plug Valve guaranteed not to bind, stick, or leak. Complete line of Power Equipment.

J. P. BELL & COMPANY
Associated Company
Commercial Export and Import Co., Inc.
Sole Representatives
Balboa Building   SAN FRANCISCO   Tel. Sutter 6833
Branches in Los Angeles, Salt Lake City, Honolulu, Australia and New Zealand

OLY GALLERIES
with J. Llewellyn Co.
Artistic Interiors
SPECIAL FURNITURE DRAPE - WALL PAPER
1635 Broadway, Oakland, Calif.
Phone Oakland 1108

“MPCO”

LIGHT WEIGHT
FIREPROOF
EVERLASTING

STONE SHINGLES
McCLENANA PRODUCTS COMPANY INC.
112 Kearny St.

When writing to Advertisers please mention this magazine.
MILLER FOLDING IRONING BOARD
ELIMINATES WALL CABINET—IS INSTALLED IN KITCHEN CUPBOARD
NO PLASTER GROUNDS SAVES WALL SPACE AND LABOR
| CASING OR PAINTING | TIME AND MATERIAL

Exhibited and sold by LANNOM BROS. MFG. CO.
Send for Catalogue to W. N. MILLER
(362 Magnolia St., Oakland, Calif.)
844 Thirteenth St., Oakland

MILLWORK Manufactured and Delivered Anywhere
Plans or Lists sent us for Estimates will have Careful and Immediate Attention.
Jno. Dudfield, Pres. and Manager
DUDFIELD LUMBER CO. Joseph A. Jury, Sec'y & Mill Supt.
MAIN OFFICE, YARD AND PLANING MILL — PALO ALTO, CALIFORNIA

GEORGE WAGNER
BUILDING CONSTRUCTION
251 Kearny Street San Francisco

A. C. SCHINDLER, President.
CHAS. F. STAUFFACHER, Secretary
THE FINK & SCHINDLER CO.
Manufacturers of INTERIOR WOODWORK AND FIXTURES
BANK, OFFICE AND STORE FITTINGS
SPECIAL FURNITURE
218-228 THIRTEENTH ST.
Bet. Mission and Howard Sts.
SAN FRANCISCO, CAL.
Telephone: Market 474

O. BAMANN, President
ERNEST HELD, Vice-President
HOME MANUFACTURING CO.
BANK, STORE AND OFFICE FITTINGS
FURNITURE AND HARDWOOD INTERIORS
CABINET WORK OF EVERY DESCRIPTION
543 and 545 BRANNAN ST. Phone Kearny 1514 San Francisco, Cal.

MULLEN MANUFACTURING CO.
BANK, STORE AND OFFICE FIXTURES—CABINET WORK OF GUARANTEED QUALITY—CHURCH SEATING
Telephone Market 8692 64 Rausch St., Bet. 7th and 8th Sts., San Francisco

JAMES L. McLAUGHLIN
GENERAL CONTRACTOR
Phones Douglas 6645 - 6646 251 KEOHNY STREET, SAN FRANCISCO

Dolan Wrecking & Construction Co.
(D. J. DOLAN)
Lumber, Lath, Nails, Shingles, Doors, Windows
and Plumbing Supplies, New and Second Hand
Phone Market 4264 Office and Yard, 1607-1639 MARKET ST., SAN FRANCISCO
United States Steel Products Co.

Rialto Bldg., San Francisco


MANUFACTURERS OF
Structural Steel for Every Purpose—Bridges, Railway and Highway—"Triangle Mesh" Wire Concrete Reinforcement—Plain and Twisted Reinforcing Bars—Plates, Shapes and Sheets of Every Description—Rails, Splice Bars, Bolts, Nuts, etc.—Wrought Pipe, Trolley Poles—Frogs, Switches and Crossings for Steam Railway and Street Railway—"Shelby" Seamless Boiler Tubes and Mechanical Tubing—"Americore" and "Globe" Rubber Covered Wire and Cables—"Reliance" Weatherproof Copper and Iron Line Wire—"American" Wire Rope, Rail Bonds, Springs, Woven Wire Fencing and Poultry Netting—Tramways, etc.

United States Steel Products Co.
OFFICES AND WAREHOUSES AT
San Francisco · Los Angeles · Portland · Seattle

When writing to Advertisers please mention this magazine.
Washed Gravel and Sand

Quality For Concrete Construction Service

Thoroughly Washed and Accurately Graded — An Ideal Concrete Aggregate

View of Plant at Niles

California Building Material Co.

Plants at Eliot and Niles, Cal. 500 Call Building, San Francisco

Otis Elevators

The Architect or Engineer can specify "Otis Elevators" assured that the responsibility of the Otis Elevator Company extends beyond satisfactory installation. Buildings equipped with Otis Elevators enjoy the advantage of the prompt service and careful inspection rendered by any of our hundred offices. Such service means your clients' gratitude.

Otis Elevator Company

Offices in All Principal Cities of the World

2300 Stockton Street, San Francisco, Calif.
Pacific Plumbing Fixtures
are preferred in every country
bordering the Pacific Ocean

PACIFIC
PLUMBING FIXTURES

For Sale by All Jobbers
Main Offices: 625 New Montgomery Street, San Francisco
Factories: San Pablo and Richmond, California
Branches: Portland and Los Angeles
When a prominent San Francisco architect—Will H. Toepke—specifies a roof of this type for his own handsome residence (shown above) it is plain to see why PABCO Roofs appeal so strongly to Architects, Engineers and Owners.

PABCO 10- and 20-Year ROOFS

are rapidly displacing the old style felt and gravel roofs. The proved superiority of PABCO Roofs is due largely to the following outstanding advantages:

1. A complete and definite specification
2. Superior wearing qualities
3. Greater tensile strength
4. Highest grade materials
5. A proved method of construction

Write for Specifications, samples and complete details.

THE PARAFFINE COMPANIES, INC.
San Francisco, California
Clocks Were Never Needed 'Til Time Acquired a Value

Electric Clock and Program Bell Systems
Automatic Control of Time Keeping Devices
for Schools, Hospitals, Public and Private Buildings, Banks, etc.,
Automatic Calling Systems

Plans, specifications and any engineering information, estimates, etc., cheerfully furnished to architects, engineers, or any one interested in this special line of work

Time Recorders Time Stamps
REPAIRS

Pacific Electric Clock Co.
516 Wells Fargo Building
Telephone Sutter 803
San Francisco, Calif.

General Machinery & Supply Co.
OFFICES AND STORE: 39-51 STEVENSON STREET
TELEPHONE - PRIVATE EXCHANGE - SUTTER 6750

-- AGENTS FOR --
EVERLASTING BLOW-OFF VALVES
WM. POWELL CO.'S
{ WHITE STAR VALVES - MODEL STAR VALVES
{ UNION COMPOSITE DISC VALVES AND PILOT GATE VALVES
YALE & TOWNE:—CHAIN HOISTS
FISHER AND SWARTWOUT STEAM SPECIALTIES

ENGINEER'S, MACHINIST'S AND STEAM FITTER'S SUPPLIES
PIPE, PIPE-FITTINGS, VALVES, BELTING, PACKING AND HOSE
TRANSMISSION AND CONVEYING MACHINERY

SEND US YOUR INQUIRIES

When writing to Advertisers please mention this magazine.
HUBBELL
Convenience Outlets

Your clients will find in our DUPLEX CONVENIENCE OUTLET No. 6257 a maximum of comfort and convenience. The double outlets permit the operation of lamp and heater, or any other two appliances, at the same time, without interference. The T-shaped slots accommodate standard attachment plug caps, and the double phosphor-bronze contact springs, gripping both sides of each blade, give strong, even current.

PACIFIC COAST REPRESENTATIVE
Garnet Young & Company
612 Howard Street, San Francisco, Cal.
Los Angeles * Portland * Seattle

ARCHITECTS
will find our complete line of receptacles, sockets, switches, etc., fully illustrated and described in our
CATALOG

HARVEY HUBBELL, INC.
ELECTRICAL SPECIALTIES
BRIDGEPORT, CONN. U. S. A.

DUPLEX Convenience Outlet
No. 6257
10 Amp.—250 Volts
Schedule H.
Plate No. 6258

SINGLE Convenience Outlet
No. 5547
10 Amp.—250 Volts
Schedule H.
Plate No. 5548

Single Convenience Outlet
No. 6282 Round Plate

When writing to Advertisers please mention this magazine.
THE ARCHITECT AND ENGINEER

DEPENDABILITY
"Since 1858"

LINOLEUMS
WINDOW SHADES
Carpets
Draperies
Rugs
Estimates Furnished

D. N. & E.
Walter & Co.
562-572 Mission Street
SAN FRANCISCO
Los Angeles Portland Seattle

PROMETHEUS
The Electric Food and Plate Warmer
Wherever meals are cooked and served, in
apartments, residences and institutions, Pro-
metheus is a highly valued asset. The wire-
less heating units placed independently of the
shelves keep food hot and tasty until ready to
serve and cannot injure the finest china.
Write for information and list of installations
The Prometheus Electric Co.
Manufacturers
511 West 42d Street, New York
Showroom, M. E. HAMMOND
Mezzanine Floor Pacific Bldg., San Francisco

"Standard"
THIRTY-SIX years experience manufac-
turing and installing Electric Time
Keeping Systems. Helpful engineer-
ing data cheerfully furnished ar-
chitects, engineers and school boards,
insuring satisfactory results, and a
direct factory branch office comple-
tely equipped to render imme-
diate service
The Standard
Electric Time Company
461 Market St., San Francisco, Cal.
Telephone Sutter 241

The Architect and Engineer—FEBRUARY, 1922—Vol. LXVIII, No. 2. Published monthly—$2.50 a
year. 627 Foxcroft Building, San Francisco, California. Entered as second-class matter, No-
vember 2, 1905, at the Post Office at San Francisco, California, under the act of March 3, 1879.
All-in-One Factory
Now in Operation

All-in-One Lavatories and common sinks are now being manufactured at our plant in Sacramento, which has been fully equipped with the latest and best machinery for the manufacture of All-in-One Plumbing Fixtures.

Within thirty days we shall be making daily deliveries of All-in-One Bathtubs and Lavatories—the fixtures that eliminate all of the exposed metal parts of the old-style fixtures by casting the hot and cold water inlets, waste pipe and overflow integral with the fixture itself.

All-in-One Fixtures are more efficient and economical in operation, more attractive in appearance and easier to keep clean—but they cost no more than the old style fixtures.

Write Dept. A for Free Illustrated Booklet Telling You About These New and Better Bathroom Fixtures

All-in-One Plumbing Fixture Corporation
231 Oschner Bldg., Sacramento
Pacific Rolling Mill Co.
SUPPLIERS OF
FABRICATED STRUCTURAL STEEL, Forgings, Bolts, Rivets, Frogs, Switches, Cast Iron Castings
General Office and Works
17th and MISSISSIPPI STS., SAN FRANCISCO
Telephone Market 215

Western Iron Works
Steel Wheel-barrows in Stock
141-147 Beale St. and 132-148 Main St. SAN FRANCISCO
Phones: GARFIELD 2575—2576

Steel Frame, California State Building, Civic Center, San Francisco.
FABRICATED BY
THE PALM IRON AND BRIDGE WORKS (Incorporated)
15th and R Streets, Sacramento

UNION CONSTRUCTION CO.
CONTRACTORS AND ENGINEERS
Steel for All Types of Building Construction and Bridges
All Classes of General Machinery Tank and Pipe Work
Gold Dredges and Their Equipment
BALFOUR BLDG.,
San Francisco Sutter 2790
Key Route Basin, Oakland Lakeside 6300

When writing to Advertisers please mention this magazine.
ARCHITECTURAL TERRA COTTA
Gladding, McBean & Company, Crocker Bldg., San Francisco.

Tropico Potteries, Inc., Glendale, Cal.

AUTOMATIC SPRINKLERS
Grinnell Co. of the Pacific, 453 Mission St., San Francisco.
Independent Automatic Sprinkler Company, 72 Natoma street, San Francisco.

AUTOMOBILES
W. L. Hughson Co., Geary St., at Van Ness Ave., San Francisco.

BANKS
First National Bank, Post and Montgomery streets, San Francisco.

BANK FIXTURES AND INTERIORS
Pink & Schindler, 218 13th St., San Francisco.
Home Mfg. Co., 543 Brannan St., San Francisco.
Mullen Manufacturing Co., 64 Rausch St., San Francisco.
Rucker-Fuller Desk Co., 677 Mission St., San Francisco.

BELTING AND PACKING
New York Belting and Packing Company, 519 Mission St., San Francisco.
H. N. Cook Belting Co., 401 Howard St., San Francisco.
Smith-Booth-Usher Co., San Francisco and Los Angeles.

BLACKBOARDS

BEVER Blackboards and Greenboards, Rucker-Fuller Desk Company, Coast agents, 677 Mission St., San Francisco; also Oakland and Los Angeles.

STEUART Sales Co., 247 Rialto Building, San Francisco.

BLINDS—VENETIAN AND DIFFUSELITE


BOILERS
California Hydraulic Engineering & Supply Co., 70-72 Fremont St., San Francisco.

Keweene Water Supply System, Simonds Machinery Co., 117 New Montgomery St., San Francisco.

BOOK BINDERS
Abbott-Brady Printing Corp’n, 460 Fourth St., San Francisco.

BONDS FOR CONTRACTORS
Bonding Company of America, Kohl Bldg., San Francisco.


Globe Indemnity Co., 444 California St., San Francisco.

Fidelity & Casualty Co. of New York, Balfour Bldg., San Francisco.

National Surety Co. of New York, 105 Montgomery St., San Francisco.

William Healey & Son, 209 Crocker Building, San Francisco.

BRASS GOODS, CASTINGS, ETC.
H. Mueller Manufacturing Co., 635 Mission St., San Francisco.

BRICK, PRESSER, PAVING, ETC.
Richmond Pressed Brick Co., Sharon building, San Francisco. Plant at Richmond, Cal.


Cannon & Co., Sacramento; and 77 O'Farrell street, San Francisco.

BRICK & CEMENT COATING
Armortize and Concreta, manufactured by W. P. Fuller & Co., all principal Coast cities.

The Paraffine Companies, Inc., 34 First St., San Francisco.


BRICK STAINS

Armortize and Concreta, manufactured by W. P. Fuller & Co., all principal Coast cities.

BUILDERS' HARDWARE
Joost Bros., agents for Russell & Erwin Hardware, 1053 Market St., San Francisco.


GRINNELL AUTOMATIC SPRINKLER
GRINNELL COMPANY
OF THE PACIFIC

VALVES
453 Mission Street, San Francisco

ENGINEERS AND CONTRACTORS

CHEMICAL FIRE
EXTINGUISHERS
AND FIRE ENGINES

When writing to Advertisers please mention this magazine.
Index to the Advertisements

<table>
<thead>
<tr>
<th>Page</th>
<th>Page</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Haines, Jones &amp; Cadbury</td>
<td>154</td>
<td>Palmer, P. A.</td>
</tr>
<tr>
<td>Hamilton, John E.</td>
<td>156</td>
<td>Paraffine Companies, Inc.</td>
</tr>
<tr>
<td>Hannah, J. D.</td>
<td>142</td>
<td>Parker, K. E., Co., Inc.</td>
</tr>
<tr>
<td>Hauser Windlass Co.</td>
<td>139</td>
<td>Perkins, W. H.</td>
</tr>
<tr>
<td>Haws Sanitary Drinking Faucet Co.</td>
<td>147</td>
<td>Phillips, Chas. T.</td>
</tr>
<tr>
<td>Healey, William</td>
<td>148</td>
<td>Picard, W. H.</td>
</tr>
<tr>
<td>Hill, Hubbell Co.</td>
<td>144</td>
<td>Platon &amp; Sons</td>
</tr>
<tr>
<td>Hillard, C. J., Co.</td>
<td>144</td>
<td>Pittsburgh Water Heater Co.</td>
</tr>
<tr>
<td>Holbrook, Mfg. &amp; Shovel Co.</td>
<td>140</td>
<td>Pope &amp; Talbot</td>
</tr>
<tr>
<td>Home Mfg. Co.</td>
<td>158</td>
<td>Promethium Electric Co.</td>
</tr>
<tr>
<td>Hubbard, Harrill, Inc.</td>
<td>158</td>
<td>Quandt, A. &amp; Son</td>
</tr>
<tr>
<td>Hugheon, W. L. Co.</td>
<td>26</td>
<td>Ray Manufacturing Co.</td>
</tr>
<tr>
<td>Hunt, Rott, W. &amp; Co.</td>
<td>132</td>
<td>Raymond Machine Co.</td>
</tr>
<tr>
<td>Hunter &amp; Hudson</td>
<td>146</td>
<td>Reliance-Guard Elevator Equipment Co.</td>
</tr>
<tr>
<td>Illinois Engineering Co.</td>
<td>151</td>
<td>Richards-Wilcox Mfg. Co.</td>
</tr>
<tr>
<td>Nathan Dehrmann Co.</td>
<td>147</td>
<td>Roberts Mfg. Co.</td>
</tr>
<tr>
<td>Sprinkler Co.</td>
<td>10</td>
<td>Rolf, Mills &amp; Co.</td>
</tr>
<tr>
<td>Jackson, S. G.</td>
<td>150</td>
<td>Ruegg Bros.</td>
</tr>
<tr>
<td>Jarvis, T. P. Mfg. Co.</td>
<td>43</td>
<td>Rucker-Fuller Desk Co.</td>
</tr>
<tr>
<td>Johnson, S. T.</td>
<td>43</td>
<td>Ryan, M. E.</td>
</tr>
<tr>
<td>Johnson Service Co</td>
<td>140</td>
<td>Safety Electric Co.</td>
</tr>
<tr>
<td>Joost Brothers</td>
<td>140</td>
<td>San Francisco Elevator Co.</td>
</tr>
<tr>
<td>Kennedy Valve Mfg. Co.</td>
<td>143</td>
<td>Santa Fe Lumber Co.</td>
</tr>
<tr>
<td>Kissel, J. R.</td>
<td>142</td>
<td>Scott Co.</td>
</tr>
<tr>
<td>Knowles, A.</td>
<td>144</td>
<td>Schrader Iron Works</td>
</tr>
<tr>
<td>Knight, Emerald</td>
<td>152</td>
<td>Scherm, J. O.</td>
</tr>
<tr>
<td>Lannom Bros. Mfg. Co.</td>
<td>158</td>
<td>Simmons, O. M. Co.</td>
</tr>
<tr>
<td>Lassen-Siegle Co.</td>
<td>154</td>
<td>Simonds Machinery Co.</td>
</tr>
<tr>
<td>Lawton &amp; Drucker</td>
<td>146</td>
<td>Smith-Booth-Usher Co.</td>
</tr>
<tr>
<td>Lawton &amp; Vesper</td>
<td>146</td>
<td>Smith &amp; Ege Mfg. Co.</td>
</tr>
<tr>
<td>Littlefield, R. W.</td>
<td>14</td>
<td>Sommer, J. M.</td>
</tr>
<tr>
<td>Los Angeles Pressed Brick Co.</td>
<td>137</td>
<td>Sonl, Edward L., Co.</td>
</tr>
<tr>
<td>Lupton, Sons Co.</td>
<td>22</td>
<td>Spencer Electric Co.</td>
</tr>
<tr>
<td>MacGruer &amp; Simpson</td>
<td>148</td>
<td>Spencer Elevator Co.</td>
</tr>
<tr>
<td>McLaren, R. Co.</td>
<td>150</td>
<td>Spott Electrical Co.</td>
</tr>
<tr>
<td>MacRorie-McLaren Co.</td>
<td>153</td>
<td>Standard Electric Time Co.</td>
</tr>
<tr>
<td>Magner Bros.</td>
<td>150</td>
<td>Standard Fire Proof Co.</td>
</tr>
<tr>
<td>Mangum &amp; Otter</td>
<td>24</td>
<td>Standard Metals Mfg. Co.</td>
</tr>
<tr>
<td>Marshall &amp; Stearns Co.</td>
<td>138</td>
<td>Standard Varnish Works</td>
</tr>
<tr>
<td>Martin &amp; Fredericks</td>
<td>144</td>
<td>Stanley Works</td>
</tr>
<tr>
<td>McClenahan Products Co.</td>
<td>157</td>
<td>Steelform Contracting Co.</td>
</tr>
<tr>
<td>McCray Refrigerator Co.</td>
<td>28</td>
<td>Stewart Sales Co.</td>
</tr>
<tr>
<td>McLaughlin, Jas. L.</td>
<td>151</td>
<td>St. Francis Hotel</td>
</tr>
<tr>
<td>Medusa Stainless Cement</td>
<td>25</td>
<td>Stockholm, Chas. &amp; Son</td>
</tr>
<tr>
<td>Mee &amp; Gottfried</td>
<td>153</td>
<td>Strable Hardwood Co.</td>
</tr>
<tr>
<td>Meyers' Safety Switch Co.</td>
<td>153</td>
<td>Sunset Lumber Company</td>
</tr>
<tr>
<td>Michel &amp; Pfeffer, Iron Works</td>
<td>117</td>
<td>S. &amp; S. Tile Co.</td>
</tr>
<tr>
<td>Montague Range &amp; Furnace Co.</td>
<td>15</td>
<td>Tittle, H. S.</td>
</tr>
<tr>
<td>Moman Bros.</td>
<td>29</td>
<td>Tomkins-Kiel Marble Co.</td>
</tr>
<tr>
<td>Mortonson Construction Co.</td>
<td>152</td>
<td>Trench, Geo. C.</td>
</tr>
<tr>
<td>Mott Co. of Calif.</td>
<td>18</td>
<td>Tropick Potters, Inc.</td>
</tr>
<tr>
<td>Mueller Mfg. Co.</td>
<td>153</td>
<td>Trost, Robt.</td>
</tr>
<tr>
<td>Mullen Mfg. Co.</td>
<td>156</td>
<td>Truscon Steel Co.</td>
</tr>
<tr>
<td>Mushett Co., W. E.</td>
<td>42</td>
<td>Uhl Bros.</td>
</tr>
<tr>
<td>Musto Sons Keenan Co.</td>
<td>12</td>
<td>Union Construction Co.</td>
</tr>
<tr>
<td>Nason, R. N. &amp; Co.</td>
<td>9</td>
<td>Unit Construction Co.</td>
</tr>
<tr>
<td>National Mill &amp; Lumber Co.</td>
<td>32</td>
<td>Unit Electric Co.</td>
</tr>
<tr>
<td>National Safety Co.</td>
<td>150</td>
<td>United Materials Co.</td>
</tr>
<tr>
<td>Nelson, James A.</td>
<td>43</td>
<td>U. S. Gunny House</td>
</tr>
<tr>
<td>Ne Page, McKenny Co.</td>
<td>155</td>
<td>U. S. Metal Products Co.</td>
</tr>
<tr>
<td>Newberry Electric Co.</td>
<td>153</td>
<td>U. S. Steel Products Co.</td>
</tr>
<tr>
<td>New York Belted and Packing Co.</td>
<td>157</td>
<td>Vermont Marble Co.</td>
</tr>
<tr>
<td>Norris Co., L. A.</td>
<td>25</td>
<td>Victory Manufacturing Co.</td>
</tr>
<tr>
<td>Oak Flooring Mfrs' Ass'n</td>
<td>19</td>
<td>Vogt, Alfred &amp; Co.</td>
</tr>
<tr>
<td>Ocean Shore Iron Works</td>
<td>15</td>
<td>Vukicevich &amp; Bagge</td>
</tr>
<tr>
<td>Old Mission Portland Cement Co.</td>
<td>36</td>
<td>Wadsworth, Howland &amp; Co., Inc.</td>
</tr>
<tr>
<td>Otis Elevator Co.</td>
<td>160</td>
<td>Walter, D. N. &amp; E. Co.</td>
</tr>
<tr>
<td>Pacific Coast Steel Company</td>
<td>151</td>
<td>Wayne Oil Tank &amp; Pump Co.</td>
</tr>
<tr>
<td>Pacific Electric Clock Co.</td>
<td>2</td>
<td>Wayne &amp; Williams</td>
</tr>
<tr>
<td>Pacific Fire Extinguisher Co.</td>
<td>9</td>
<td>Weber, C. F. &amp; Co.</td>
</tr>
<tr>
<td>Pacific Gas &amp; Electric Co.</td>
<td>143</td>
<td>Wentworth, F. W.</td>
</tr>
<tr>
<td>Pacific Heating Co.</td>
<td>146</td>
<td>West Coast Paper Mills, Back Cover</td>
</tr>
<tr>
<td>Pacific Mfg. Co.</td>
<td>15</td>
<td>Western Blind &amp; Screen Co.</td>
</tr>
<tr>
<td>Pacific Plumbing Fixtures, 2d Cover</td>
<td>15</td>
<td>Western Iron Works</td>
</tr>
<tr>
<td>Pacific Porcelain Ware Co., 2d Cover</td>
<td>143</td>
<td>Western Pipe and Steel Co.</td>
</tr>
<tr>
<td>Pacific Rolling Mills</td>
<td>15</td>
<td>Welton, W. F.</td>
</tr>
<tr>
<td>Pacific Rolling Mills</td>
<td>15</td>
<td>Witt, G. E. Co.</td>
</tr>
<tr>
<td>Pacific Rolling Mills</td>
<td>15</td>
<td>Zelinski, D. &amp; Sons</td>
</tr>
<tr>
<td>Palm Iron Works</td>
<td>6</td>
<td>Zorn Drawn Metals Co.</td>
</tr>
</tbody>
</table>

The ARCHITECT AND ENGINEER
Nason's Opaque Flat Finish

A Flat Washable Oil Paint, made in soft Kalsomine tints—a practical article for Walls, Ceilings, Etc. "Agency" for Tamlin & Nolan's ARNISHES and FINISHES, made on the Pacific Coast to stand our climatic conditions.

R. N. NASON & CO. Paint Makers
151 Potrero Ave., 436 Market St., San Francisco—Portland—Seattle—Oregon

Architects' Specification Index—Continued

Building Materials, Supplies, Etc.
Abell-Jensen Co., Call Bldg., San Francisco.
Waterhouse-Wilcox Co., 523 Market St., San Francisco.

Building Paper
The Paraffine Companies, Inc., San Francisco.
Los Angeles, Portland and Seattle.

Cabinet Makers
Home Manufacturing Company, 543 Brannan St., San Francisco.
Fink & Schindler Co., 218 13th St., San Francisco.
Mullen Manufacturing Company, 64 Rausch St., San Francisco.

Carpets
John Breuner Co., 281 Geary St., San Francisco.
D. N. & E. Walter, Mission near Second street, San Francisco.
W. & J. Sloane, 216-228 Sutter street, San Francisco.

Casing Window Hardware

Casting

Cement
Mt. Diablo, sold by Henry Cowell Lime & Cement Co., 2 Market St., San Francisco.

Cement Exterior Waterproof Paint
Armorite, sold by W. P. Fuller & Co., all principal Coast cities.

Cement Tests—Chemical Engineers
Robert W. Hunt & Co., 251 Kearny St., San Francisco.

Clay Products
Cannon & Co., Sacramento, Cal.
Gladding, McBean & Co., Crocker Bldg., San Francisco.
Los Angeles Pressed Brick Co., Frost Bldg., Los Angeles.
Tropico Pottery, Inc., Glendale, Cal.

Clocks—Electric Time
Pacific Electric Clock Co., 516 Wells-Fargo Bldg., San Francisco.
Standard Electric Time Co., 461 Market St., San Francisco.

Cold Storage Plants
T. P. Jarvis Crude Oil Burning Co., 275 Connecticut St., San Francisco.

Composition Floors
"Linolol" plastic flooring, Hill, Hubbell & Co., 115 Davis street, San Francisco; 410 San Fernando Bldg., Los Angeles.

Concrete Construction
Barrett & Hep, 918 Harrison St., San Francisco.
Clinton Construction Co., 140 Townsend street, San Francisco.
K. E. Parker Co., Inc., Clunie Bldg., San Francisco.
P. A. Palmer, Monadnock Bldg., San Francisco.
J. M. Sommer, 401 Balboa Bldg., San Francisco.
Steelform Contracting Company, 681 Market St., San Francisco.

Concrete or Cement Hardener

Concrete Mixers
Foote and Jaeger mixers sold by Edward R. Bacon Co., 51 Minna St., San Francisco, also Los Angeles.
Ransome mixers sold by the Garfield Co., Hearst Bldg., San Francisco.
Smith-Joost-Usher Co., San Francisco and Los Angeles.

Concrete Reinforcement
United States Steel Products Co., San Francisco, Los Angeles, Portland and Seattle.
Pacific Coast Steel Company, Rialto Bldg., San Francisco.
Truscon Steel Co., 527 Tenth St., San Francisco.
Badt-Falk Co., Call-Post Bldg., San Francisco.

Conducts
Garrett Young & Co., 612 Howard St., San Francisco.

Contractors, General
Barrett & Hep, 918 Harrison St., San Francisco.
Larsen-Sigrist Co., Inc., 807 Claus Spreckels Bldg., San Francisco.
R. W. Littlefield, 337 12th St., Oakland.
Lawton & Veezy, Call building, San Francisco.
Plaza building, Oakland.
K. E. Parker Co., Inc., Clunie Bldg., San Francisco.
Unit Construction Co., Phelan Bldg., San Francisco.
J. D. Hannah, 142 Sansome St., San Francisco.
John M. Bartlett, 337 Twelfth St., Oakland.
Chas. Stockholm & Son, Monadnock Bldg., San Francisco.

Globe Automatic Sprinklers
Will protect your building and business from destruction by fire and reduce your Insurance Rate. Write for estimates.

Pacific Fire Extinguisher Company
Fire Protection Engineers
424-440 Howard Street, San Francisco
Independent Automatic Sprinkler Company
Fire Protection Engineers

Approved Devices
72 Natoma Street, San Francisco

ARCHITECTS' SPECIFICATION INDEX—Continued

CONTRACTORS, GENERAL—Continued
Herbert Beckwith, 323 Newton Ave., Oakland.
Colman & Speidel, 546 Monadnock Bldg., San Francisco.
Clinton Construction Company, 140 Townsend St., San Francisco.
Mason Bros., 251 Kearny street, San Francisco.
Fontanella & Teza, 1682 Eddy Street, San Francisco.
Ceo. Wagner, 251 Kearny street, San Francisco.
T. B. Goodwin, 180 Jessie St., San Francisco.
Robert Trost, 26th and Howard Sts., San Francisco.
J. M. Sommer, 401 Balboa Bldg., San Francisco.
S. G. Rock, 220 12th St., Oakland.
L. McLaughlin, 251 Kearny street, San Francisco.

J. R. H. Vogt, 185 Stevenson street, San Francisco.

CONTRACTORS' EQUIPMENT
Edward R. Bacon Co., 51 Minna St., San Francisco, and Los Angeles.
Garfield & Co., Hearst Bldg., San Francisco.
Smith, Booth-Usher Co., 60 Fremont St., San Francisco.
228 Central Ave., Los Angeles.

CONVEYING MACHINERY
Meese & Gottfried, San Francisco,Los Angeles.
Portland and Seattle.

CONVENIENCE OUTLETS
Harvey Hubbell, Inc., Bridgeport, Conn., represented in San Francisco by Garnett Young & Co., 612 Howard street.

CRUSHED ROCK
Coast Rock & Gravel Co., Call-Post Bldg., San Francisco.

DAMP-PROOFING AND WATERPROOFING
Gunn, Carle & Co., Inc., 444 First street, San Francisco.
Hill, Hubbell & Company, 115 Davis St., San Francisco.

"Pabco" Damp-Proofing Compound, sold by the Paraffine Companies, Inc., San Francisco, Los Angeles, Portland and Seattle.

DOOR HANGERS
Picher Hanger, sold by National Lumber Co., 426 Market St., San Francisco.
Stanley Works, New Britain, Conn. Monadnock Bldg., San Francisco.

DRINKING FOUNTAINS

Crane Company, San Francisco, Oakland, and Los Angeles.
Pacific Pipe & Valve Co., 67 New Montgomery St., San Francisco.
Haines, Jones & Cadbury Co., 837 Folsom St., San Francisco.

DUMB WAITERS
Spencer Elevator Company, 166 7th St., San Francisco.

ELECTRICAL CONTRACTORS
Butte Electrical Equipment Company, 530 Folsom St., San Francisco.
Butte Electric & Manufacturing Co., 534 Folsom St., San Francisco.
Central Electric Company, 185 Stevenson street, San Francisco.

New Page, McKenny Co., 589 Howard St., San Francisco.

Newberry Electrical Co., 339 Sutter street, San Francisco.

Pacific Fire Extinguisher Co., 424 Howard St., San Francisco.

Globo Electric Works, 1959 Mission St., San Francisco.
M. E. Ryan, Redwood City, and 520 Clunie building, San Francisco.
H. S. Little, 766 Folsom St., San Francisco.
Spencer Electric Co., 355 12th street, Oakland.


ELECTRIC PLATE WARMER
The Prometheus Electric Plate Warmer for residences, clubs, hotels, etc. sold by M. E. Hammond, Pacific Bldg., San Francisco.

ELECTRICAL SUPPLIES AND EQUIPMENT
Garnett Young & Co., 612 Howard St., San Francisco.
Butte Electrical Equipment Co., 530 Folsom St., San Francisco.
Harvey Hubbell, Inc., Bridgeport, Conn., represented in San Francisco by Garnett Young & Co., 612 Howard street.

Safety Electric Company, 56-65 Columbia Square, San Francisco.


ELEVATORS
Otis Elevator Company, Stockton and North Point, San Francisco.
Spencer Elevator Company, 166 7th St., San Francisco.

San Francisco Elevator Co., 860 Folsom street, San Francisco.

ENGINEERS—CONSULTING, ELECTRICAL, MECHANICAL
Chas. T. Phillips, Pacific Bldg., San Francisco.
Hunter & Hudson, Rialto Bldg., San Francisco.

ELEVATOR DOOR HARDWARE

ESTIMATOR—BUILDINGS AND ENGINEERING WORKS
Arthur Friddle, 185 Stevenson street, San Francisco.

PNUEMATIC WATER PRESSURE SYSTEMS
ALL SIZES AND TYPES—For Private Homes and Public Buildings
CALIFORNIA HYDRAULIC ENGINEERING AND SUPPLY CO.
80 Fremont Street
San Francisco
TEMPERATURE REGULATION
JOHNSON SERVICE COMPANY
(OF MILWAUKEE—ESTABLISHED 1885)
Manufacturers and Installers of
JOHNSON
Heat, Humidity, CONTROL
For schools, residences, hospitals, banks, public buildings, also canneries
and all kinds of industrial plants—Hot water tank regulators, air and
water reducing valves.
Rialto Bldg., SAN FRANCISCO 605 Van Nuys Bldg., LOS ANGELES

ARCHITECTS’ SPECIFICATION INDEX—Continued

FAIENCE TILE
Tropico Potteries, Inc., Glendale, Cal.
FIRE—asphalt, deadening
The Paradine Company, Inc., San Francisco,
Los Angeles, Portland and Seattle.
FENCES—wire
Standard Fence Construction Co., 245 Market
St., San Francisco, and 310 12th St., Oakland.
FILLING STATION EQUIPMENT
S. F. Bowser & Co., Inc., 612 Howard St.,
San Francisco.
Wayne Oil Tank & Pump Co., 631 Howard
St., San Francisco, 830 S. Los Angeles St.,
Los Angeles.
FIRE ESCAPES
Michel & Pfeffer Iron Works, 1415 Harrison
Street, San Francisco.
Palm Iron & Bridge Works, Sacramento.
Western Iron Works, 141 Beale St., San Francisco.
FIRE PROOF DOORS
Forleser Corneal Works, 269 Potrero avenue,
San Francisco.
U. S. Metal Products Co., 330 10th street, San
Francisco.
Fire Protection Products Co., 3117 20th street,
San Francisco.
FIRE SPRINKLERS—automatic
Grinnell Company, 453 Mission St., San
Francisco.
Independent Automatic Sprinkler Company, 72 Natoma
street, San Francisco.
Pacific Fire Extinguisher Co., 424 Howard St.,
San Francisco.
FIRE RETARDING PAINT
The Paradine Company, Inc., 34 First St., San
Francisco.
FIXTURES—Bank, office, store, etc.
Home Manufacturing Company, 543 Ithamar St.,
San Francisco.
The Fink & Schindler Co., 218 13th St., San
Francisco.
Mullen Manufacturing Co., 64 Rausch St., San
Francisco.
C. F. Weber & Co., 985 Market St., San Francisco,
and 210 N. Main St., Los Angeles, Cal.
FLOOR TILE
Mangrum & Otter, 827 Mission St., San Francisco.
S. & L. Tile Company, San Jose.
FLOOR VARNISH
Bass-Huehner and San Francisco Pioneer Varnish
Works, 815 Mission St., San Francisco.
Fifteen for Floors, made by W. P. Fuller & Co.,
San Francisco.
Standard Varnish Works, Chicago, New York
and San Francisco.
R. N. Nason & Co., San Francisco and Los
Angeles.
The Paradine Company, Inc., San Francisco,
Los Angeles, Portland and Seattle.
FLOORS—hardwood
Oak Flooring Manufacturers’ Association of the
United States, Ashland Block, Chicago, Ill.
Parrott & Co., 320 California St., San Francisco.
Struble Hardwood Company, 511 First street,
Oakland.
FLOORS—Mastic—floor covering
Hill, Hubbell & Company, 115 Davis St., San
Francisco.
The Paradine Company, Inc., San Francisco,
Los Angeles, Portland and Seattle.
FUMES
California Corrugated Culvert Co., West Berke-
ley, Cal.
Jas. A. Nelson, 517 Sixth St., San Francisco.
FUEL OIL SYSTEMS
S. T. Johnson Co., 1337 Mission St., San
Francisco.
S. F. Bowser & Co., Inc., 612 Howard St.,
San Francisco.
Wayne Oil Tank & Pump Co., 631 Howard St.,
San Francisco.
FURNACES—warm air
Mangrum & Otter, 827 Mission St., San Fran-
cisco.
Montague Range and Furnace Co., 826 Mission
St., San Francisco.
Pacific Heating Company, Second and Grove
streets, Oakland.
FURNITURE—built-in
Hounger Kitchen Cabinet Store, Pacific Bldg.,
San Francisco.
FURNITURE—School, Church, office,
house, etc.
Home Manufacturing Company, 543 Brannan St.,
San Francisco.
C. F. Weber & Co., 985 Market St., San
Francisco.
Rucker-Fuller Desk Co., 677 Mission St., San
Francisco.
F. W. Wentworth & Co., 539 Market St., San
Francisco.
W. & J. Sloane, 216 Sutter street, San Francisco.
GARAGE HARDWARE
The Stanley Works, New Britain, Conn., Coast,
Sale offices, San Francisco, Los Angeles and Seattle, Wash
Richards-Wilcox Mfg. Co., Aurora, III., and
Underwood Bldg., San Francisco.
California Hydraulic Engineering & Supply Co.,
70-72 Fremont St., San Francisco.
GAS STEAM RADIATORS—Fumeless, etc.
Ra-Do Fumeless Gas Radiators, manufactured
and sold by Baird-Bailhache Co., 478 Sutter
St., San Francisco,
GLASS
American Window Glass Company, represented by
L. H. Butcher Co., 862 Mission St., San Francisco.
Coblledick-Kibbe Glass Co., 175 Jessie St., San
Francisco.
Fuller & Goepf, 32 Page St., San Francisco, and
Symplye building, Oakland.
W. P. Fuller & Company, all principal Coast
cities.
GRADING, WRECKING, etc.
Dolan Wrecking & Construction Co., 1607
Market St., San Francisco.
GRANITE
California Granite Co., Gen. Contractors’ Ass’n,
San Francisco.
Raymond Granite Co., Potrero Ave. and Division
St., San Francisco.
ARCHITECTS’ SPECIFICATION INDEX—Continued

GRANITE AND SAND
Coast Rock & Gravel Co., Call-Post Bldg., San Francisco.
Del Monte White Sand, sold by Del Monte Properties Co., Crocker Bldg., San Francisco.

GYMNASIUM EQUIPMENT
Ellery Arms Co., 583 Market St., San Francisco.
A. G. Spalding & Bros., 655 Market St., San Francisco.

HARDWARE PLASTER
Henry Cowell Lime & Cement Co., San Francisco.

HARDWARE
Joost Bros., agents for Russell & Erwin hardware, 1053 Market St., San Francisco.
The Stanley Works, New Britain, Conn.; Coast sales offices, San Francisco, Los Angeles, and Seattle, Wash.
Corbin hardware, sold by Palace Hardware Co., 581 Market St., San Francisco.

HARDWOOD LUMBER—FLOORING, ETC.
Parrott & Co., 320 California St., San Francisco.
Strahle Hardwood Company, First street, near Broadway, Oakland.
E. L. Bruce Company, American oak flooring, Memphis, Tenn.

HEATERS—AUTOMATIC, GAS, ELECTRIC
Electric Sales Service Co., mfrs. of Thern-elect Water Heater, West Berkeley.
Pittsburgh Water Heater Co., 478 Sutter St., San Francisco.
Rou-Du Fuelless Gas Heater, sold by Baird-Bailhache Company, 478 Sutter St., San Francisco.
Wm. J. Schwiner, Agent Halbutt Electric Steam Radiator, Rialto Bldg., San Francisco.

HEATING AND VENTILATING CONTRACTOR’S EQUIPMENT, ETC.
Alex Coleman, 706 Ellis St., San Francisco.
Gille-Schmid Company, 198 Otis St., San Francisco.
Hateley & Hateley, Mitau Bldg., Sacramento.
General Boilers Co., 332 Monadnock Bldg., San Francisco.
Mangrum & Otter, 827-831 Mission St., San Francisco.
Lawson & Drucker, 450 Hayes St., San Francisco.
James A. Nelson, 517 Sixth St., San Francisco.
William F. Wilson Co., 328 Mason St., San Francisco.
Pacific Fire Extinguisher Co., 424 Howard St., San Francisco.
Mechanical Engineering & Supply Co., 908 7th St., Sacramento.
Scott Company, 243 Minna St., San Francisco.
O. M. Simmons Co., 115 Mission St., San Francisco.
Griffin Sheet Metal Works, Fresno.

HOLLOW TILE BLOCKS
Cannon & Co., plant at Sacramento; 770 O’Farrell street, San Francisco.
Los Angeles Pressed Brick Co., Frost Bldg., Los Angeles.

HOSPITAL FIXTURES
Mott Company of California, 553 Mission St., San Francisco.

HOSPITAL SIGNAL SYSTEM
Chicago Signal Co., represented by Garnett Young & Co., 612 Howard St., San Francisco.

HOTELS
St. Francis Hotel, Powell, Geary and Post Sts., San Francisco.

INGOT IRON
“Armour” brand, manufactured by American Rolling Mill Company, Middletown, Ohio, and 10th and Bryant streets, San Francisco.

INSPECTIONS AND TESTS
Robert West Hunt & Co., 251 Kearny St., San Francisco.

INSURANCE BROKERS
Willis Healey & Son, Crocker Bldg., San Francisco.

INTERIOR DECORATORS
Atherly Bros., 2032 Polk St., San Francisco.
Martin & Frederick, 1374 Sutter St., San Francisco.
John Breuner Co., 281 Geary St., San Francisco.
The Tormey Co., 1042 Larkin St., San Francisco.
A. Quandt & Son, 374 Guerrero street, San Francisco.

KITCHEN CABINETS
Hoosier Kitchen Cabinet Store (O. K. Brown, Mgr.), Pacific Bldg., San Francisco.

KITCHEN EQUIPMENT
Griffin Sheet Metal Works, Fresno.

LAMP POSTS, ELECTROLIERS, ETC.
J. L. Mott Iron Works, 553 Mission St., San Francisco.

LANDSCAPE ARCHITECT
Emerson Knight, 704 Market street, San Francisco.

LANDSCAPE GARDENERS
Mackenzie-McLaren Co., 141 Powell St., San Francisco.

LATHING AND PLASTERING
Mackey & Simpson, Call-Post Bldg., San Francisco.
A. Knowles, Call-Post Bldg., San Francisco.

LATHING MATERIAL
Pacific Materials Co., 525 Market St., San Francisco.
Trusted Steel Co., Tenth St., near Bryant, San Francisco.

Haines Heating Systems
ASSURE Heating Satisfaction
O. M. SIMMONS CO. 115 Mission St., San Francisco Phone: Douglas 5497
JOSEPH MUSTO SONS-KEENAN CO.

ARCHITECTS' SPECIFICATION INDEX—Continued

LIGHT, HEAT AND POWER
Great Western Power Company, Stockton St., near Sutter, San Francisco.

LIGHTING FIXTURES
Thomas Day Company, Mission, near Third street, San Francisco.
Roberts Mfg. Co., 663 Mission St., San Francisco.
Electric Appliance Co., 807 Mission street, San Francisco.

LIME
Henry Cowell Lime & Cement Co., 2 Market St., San Francisco.

LINOLEUM
D. N. & E. Walter & Co., 562 Mission St., San Francisco.
The Paraffine Companies, factory in Oakland; office, 34 First St., near Market, San Francisco.
W. & J. Sloane, 216 Sutter street, San Francisco.

LUBRICATING OIL STORAGE TANKS AND PUMPS
S. F. Bowser & Co., Inc., 612 Howard St., San Francisco.

LUMBER
Duelfeld Lumber Co., Palo Alto, Cal.
Hart-Cood Lumber Co., Fifth and Berry Sts., San Francisco.

MAGNESITE FLOORING, STUCCO, ETC.
Dorn Mfg. Co., 116 Utah Street, San Francisco; Metropolitan Bldg., Los Angeles.

MAIL CHUTES
American Mailing Device Corp., represented on Pacific Coast by Waterhouse-Wilcox Co., 523 Market St., San Francisco.

MANTELS—WOOD, TILE, ETC.
Mangrum & Ooter, 827-831 Mission St., San Francisco.
Fink & Schindler, 218 12th street, San Francisco.

MANUAL TRAINING EQUIPMENT
Smith-Booth-Ushe Co., San Francisco and Los Angeles.

MARBLE
American Marble and Mosaic Co., 25 Columbus Square, San Francisco.
Ray Cook Marble Company, foot of Powell street, Oakland.
Joseph Musto Sons, Keenan Co., 535 N. Point St., San Francisco.
Vermont Marble Co., Coast branches, San Francisco, Portland and Tacoma.
Tomlinson-Kiel Marble Company, 585 Fifth Ave., New York; also Chicago, Philadelphia and San Francisco.

METAL DOORS AND WINDOWS
Fire Protection Products Co., 3117 20th St., San Francisco.
Waterhouse-Wilcox Co., Inc., 523 Market St., San Francisco.
U. S. Metal Products Co., 330 Tenth St., San Francisco.

METAL FURNITURE
Forderer Cornice Works, 269 Potrero avenue, San Francisco.

MILL WORK
Duelfeld Lumber Co., Palo Alto, Cal.
Pacific Manufacturing Company, San Francisco, Los Angeles, Oakland and Santa Clara.
National Mill and Lumber Co., San Francisco and Oakland.
The Fink & Schindler Co., 218 13th St., San Francisco.

NOTARY PUBLIC
William Healey & Son, 208 Crocker building, San Francisco.

OFFICE EQUIPMENT
Rucker-Fuller Co., 677 Mission St., San Francisco.
F. W. Wentworth & Co., 539 Market St., San Francisco.
Stewart Sales Co., 517 Rialto Bldg., San Francisco.

OIL BURNERS
Fess System Co., 220 Natoma St., San Francisco.
S. T. Johnson Co., 1337 Mission St., San Francisco.
G. E. Witt Co., 862 Howard St., San Francisco.
F. L. Warner, 696 20th St., Oakland.

OIL STORAGE AND DISTRIBUTING STATIONS
S. F. Bowser & Co., Inc., 612 Howard St., San Francisco.
S. T. Johnson Co., 1337 Mission St., San Francisco.
Wayne Oil Tank & Pump Co., 631 Howard St., San Francisco; 830 S. Los Angeles St., Los Angeles.

ORNAMENTAL IRON AND BRONZE
California Artistic Metal and Wire Co., 349 Seventh St., San Francisco.
Federal Ornamental Iron and Bronze Co., 16th St. and San Bruno Ave., San Francisco.
Michel & Pfeffer Iron Works, 1415 Harrison street, San Francisco.
Palm Iron & Bridge Works, Sacramento.
Schrader Iron Works, Inc., 1247 Harrison St., San Francisco.

RAY COOK MARBLE CO.
IMPORTED AND DOMESTIC MARBLES
For Building Construction

Factory and Office, Foot of Powell St., Oakland

Phone Piedmont 1009
ARCHITECTS' SPECIFICATION INDEX—Continued

OVERHEAD CARRYING SYSTEMS
California Hydraulic Engineering & Supply Co., 70-72 Fremont St., San Francisco.
Richards, F. A. & Wix, W., 1906, Aurora, Ill., and Underwood Bldg., San Francisco.

PAINT FOR STEEL STRUCTURES, BRIDGES, ETC.
The Paraffine Companies, Inc., 34 First St., San Francisco.
Hill, Hubbell & Company, 115 Davis street, San Francisco.
Wadsworth, Howland Co., makers of Bay State Brick and Cement Coating, Boston, Mass.
James Hamblen & Son, Distributors in San Francisco and Los Angeles.

PAINTING, TINTING, ETC.
Athery Bros., 2032 Polk St., San Francisco.
Wayne & Williams, 1914 Fillmore St., San Francisco.
I. R. Kessel, 1747 Sacramento St., San Francisco.
D. Zelinsky & Sons, San Francisco and Los Angeles.
Tennery Co., 681 Geary St., San Francisco.
Pick Bros., 475 Haight St., San Francisco.
A. Quandt & Son, 374 Guerrero street, San Francisco.

PAINTS, OILS, ETC.
Magner Bros., 414-424 Ninth St., San Francisco.
Bar-Hunter Paint Co., Mission, near Fourth St., San Francisco and all principal coast cities.
The Paraffine Companies, Inc., San Francisco, Los Angeles, Portland and Seattle.

PAINTING, MILLING AND ROLLING

PIPE—STEEL AND WROUGHT IRON
Western Pipe & Steel Co., 444 Market St., San Francisco; 1758 N. Broadway, Los Angeles.

PIPE FITTINGS

PLASTER

PLASTERING CONTRACTORS
A. Knowles, Call building, San Francisco.
MacGruer & Simpson, 260 Tehama street, San Francisco.

PLAYGROUND APPARATUS
A. G. Spalding & Bros., 625 Market St., San Francisco.

PLUMBING CONTRACTORS
Alex Coleman, 706 Ellis St., San Francisco.
Thos. Brodie, 2119 Fillmore street, San Francisco.
Gilley-Schmid Company, 198 Otis street, San Francisco.
Hateley & Hateley, Mitan Bldg., Sacramento.
Scott Co., Inc., 243 Minna St., San Francisco.
Wn. F. Wilson Co., 328 Mason St., San Francisco.
W. H. Picard, 5656 College avenue, Oakland.

PLUMBING FIXTURES, MATERIALS, ETC.
All-In-One Plumbing Fixture Corporation, 231 Oschner building, Sacramento.
California Steel & Plumbing Supply Co., 671 Fifth St., San Francisco.
Crane Co., San Francisco, Oakland, Los Angeles.
Gilley-Schmid Company, 198 Otis St., San Francisco.
Haines, Jones & Cadbury Co., 857 Folsom St., San Francisco.
H. Mueller Manufacturing Company, 635 Mission St., San Francisco.
Holbrook, Merrill & Stetson, 64 Sutter St., San Francisco.

PACIFIC Sanitary Manufacturing Co., 67 Montgomery, St., San Francisco.
West Coast Porcelain Manufacturers, Rialto building, San Francisco.

POLES AND PILING
Santa Fe Lumber Co., 16 California street, San Francisco.

POWER TRANSMITTING MACHINERY
Mces & Gottfried, San Francisco, Los Angeles, Portland, Ore., and Seattle, Wash.

PRELIMINARY ESTIMATES, VALUATIONS
Arthur Priddle, 185 Stevenson street, San Francisco.

PUBLIC QUANTITY SURVEY PLAN
Arthur Priddle, 185 Stevenson street, San Francisco.

PUMPS
Chicago Pump Co., represented by Garnett, Young & Co., 612 Howard St., San Francisco.
California Hydraulic Engineering & Supply Co., 70 Fremont St., San Francisco.
Simonds Machinery Co., 117 New Montgomery St., San Francisco.
Ocean Shore Iron Works, 558 Eighth St., San Francisco.

PUMPS—AND OR POWER, FOR OIL AND GASOLINE
S. F. Bowser & Co., Inc., 612 Howard St., San Francisco.
S. T. Johnson Co., 1337 Mission St., San Francisco.
Wayne Oil Tank & Pump Co., 631 Howard St., San Francisco; 530 S. Los Angeles St., Los Angeles.

QUANTITIES SURVEYOR FOR CONTRACTORS
Arthur Priddle, 185 Stevenson street, San Francisco.

RADIATORS—ELECTRIC STEAM
William J. Scherwin, 217 Rialto Building, San Francisco.

RADIATOR TRAPS

REINFORCING STEEL
Edward L. Soule, Rialto Building, San Francisco.
Bald-Falk & Co., Call Bldg., San Francisco.
Pacific Coast Steel Co., Rialto Building, San Francisco.
Truscott Steel Co., 527 10th St., San Francisco.

REFRIGERATORS
McCray Refrigerator Company, San Francisco office, 740 Mission street.

ROCK AND GRAVEL
Cost Rock & Gravel Co., Call Bldg., San Francisco.

ROOFING CONTRACTORS
Bender Roofing Company, Monadnock Bldg., San Francisco.

ROOFING AND ROOFING MATERIALS
"Malthoid" and "Ruberoid," also "Pabco" ten and twenty year roofs, manufactured by the Paraffine Companies, Inc., San Francisco.

RUBBER TILING
New York Beltting and Packing Company, 518 Mission St., San Francisco.

SAFETY TREADS
Pacific Materials Co., 525 Market St., San Francisco.

SAND
Cost Rock & Gravel Co., Call Bldg., San Francisco.
Del Monte White Sand, Del Monte Properties Co., 401 Crocker Bldg., San Francisco.

SASH AND CABLE CHAINS
Smith & Egge Mfg. Co., Bridgeport, Conn.
Coast Agents Rawlins & Smith, San Francisco and Los Angeles.
from tree to Consumer
Pine and Redwood Lumber
SASH DOORS AND MILL WORK
SUNSET LUMBER COMPANY
MANUFACTURERS—WHOLESALE AND RETAIL
Main Office and Yards:
FIRST AND OAK STREETS, OAKLAND
Phone Oakland 1820

POPE & TALBOT
Manufacturers, Exporters and Dealers in
Lumber, Timber, Piles, Spars, etc.
Office, Yards and Planing Mills
859-869 THIRD ST., SAN FRANCISCO, CAL.
Mills, Port Gamble, Port Ludlow and Utsalady, Washington

PACIFIC MANUFACTURING COMPANY
MILLWORK, SASH AND DOORS
Hardwood Interior Trim a Specialty
Main Office:
SANTA CLARA, CALIF.
SAN FRANCISCO, 177 Stevenson Street
OAKLAND, 1001 Franklin Street
LOS ANGELES, 908 Washington Building
SAN JOSE, 16 North First Street

When writing to Advertisers please mention this magazine.
ARCHITECTS' SPECIFICATION INDEX—Continued

SCENIC PAINTING—DROP CURTAINS, ETC.
The Edwin H. Flagg Scenic Co., 1638 Long Beach Ave., Los Angeles.

SCHOOL FURNITURE AND SUPPLIES
Rucker-Fuller Desk Company, 677 Mission St., San Francisco.
Stewart Sales Co., 247 Rialto Building, San Francisco.

SHEATHING AND SOUND DEADENING
The Faraffine Companies, Inc., 34 First St., San Francisco.

SHEET METAL WORK
Forderer Cornice Works, 269 Potrero ave., San Francisco.
Griffin Sheet Metal Works, Fresno, Calif.
Pacific Heating Company, Second and Grove streets, Oakland.
U. S. Metal Products Co., 330 10th street, San Francisco.
Fire Protection Products Co., 3117 20th street, San Francisco.

SHINGLE STAINS
Bas-Hueter Paint Company, all principal Coast cities.
Cabot's Creosote Stains, sold by Pacific Building Materials Co., 525 Market St., San Francisco.
Fuller's Pioneer Shingle Stains, made by W. P. Fuller & Co., San Francisco.

SHINGLES—COMPOSITION, UNIT AND STRIP
The Paraffine Companies, Inc., San Francisco, Los Angeles, Portland and Seattle.

SINKS—COMPOSITION

STEEL HEATING BOILERS
California Hydraulie Engineering & Supply Co., 70-72 Fremont St., San Francisco.

STEEL TANKS, PIPE, ETC.
Ocean Shore Iron Works, 558 Eighth St., San Francisco.
S. T. Johnson Co., 1337 Mission St., San Francisco.
Western Pipe and Steel Co., 444 Market street, San Francisco.

STEEL AND IRON—STRUCTURAL
Central Iron Works, 621 Florida St., San Francisco.
Michel & Pfeffer Iron Works, 1415 Harrison street, San Francisco.
Benson & Benson, The Alameda, San Jose.
Mortensen Construction Co., 19th and Indiana Sts., San Francisco.

Pacific Rolling Mills, 17th and Mississippi Sts., San Francisco.
Palm Iron & Bridge Works, Sacramento.
U. S. Steel Products Co., Rialto Bldg., San Francisco.
Schrader Iron Works, Inc., 1247 Harrison St., San Francisco.
Union Construction Co., 604 Mission street, San Francisco, and Key Route Fell, Oakland.
Western Iron Works, 141 Beale St., San Francisco.

STEEL PRESERVATIVES
Hill, Hubbard & Company, 115 Davis St., San Francisco.

STEEL ROLLING DOORS

STEEL SASH
Bayley-Springfield solid steel sash, sold by Pacific Material Co., 525 Market St., San Francisco.
Michel & Pfeffer Iron Works, 1415 Harrison street, San Francisco.
U. S. Metal Products Company, 330 Tenth St., San Francisco.
Truscon Steel Company, 527 Tenth street, San Francisco.

STOREFRONTS

STUDDING—FIREPROOF STEEL
Steel Studding Company, 1216 Folsom St., San Francisco.

SUMP AND BILGE PUMPS
California Hydraulic Engineering & Supply Co., 70-72 Fremont St., San Francisco.

SWITCHES AND SWITCHBOARDS
Wemco Safety Switch, manufactured and sold by W. E. Masket Co., 502 Mission St., San Francisco.
Safety Electric Co., 59 Columbia Square, San Francisco.
Western Electric Safety Switch Co., Inc., 247 Minna street, San Francisco.
Meyer's Safety Switch Co., 573 Howard Street, San Francisco.
Unit Electric Co., 450-60 Natoma Street, San Francisco.
THEATER AND OPERA CHAIRS
Rucker-Fuller Desk Co., 677 Mission street, San Francisco.

THERMOSTATS FOR HEAT REGULATION
Johnson Service, Rialto Bldg., San Francisco.

TILE FOR ROOFS, MANTELS, ETC.
Cannon & Co., Sacramento; and 77 O'Farrell St., San Francisco.
Gladding, Mclean & Co., Crocker Bldg., San Francisco.
S. & S. Tile Co., 4th and Carrie streets, San Jose.

TRANSMISSION MACHINERY
Meese & Gottfried Co., San Francisco, Los Angeles, Portland and Seattle.

VALVES—PIPES AND FITTINGS
California Steam & Plumbing Supply Co., 671 Fifth St., San Francisco.
Crane Radiator Valves, manufactured by Crane Co., Second and Brannan Sts., San Francisco.
Grinnell Co., 453 Mission St., San Francisco.
O. M. Simmons Co., 115 Mission St., San Francisco.
W. E. Muehle Co., 502 Mission St., San Francisco.

VALVE PACKING
N. H. Cook Belting Co., 317 Howard St., San Francisco.

VARNISHES
W. P. Fuller Co., all principal Coast cities.
Standard Varnish Works, 55 Stevenson St., San Francisco.

VENETIAN BLINDS, AWNINGS, ETC.
Western Blind & Screen Co., 2702 Long Beach Ave., Los Angeles.

VITREOUS CHINAWARE
Pacific Porcelain Ware Company, 67 New Montgomery St., San Francisco.
West Coast Porcelain Manufacturers, Rialto Building, San Francisco.

WALL BEDS, SEATS, ETC.

WALL BOARD

WALL PAPER AND DRAPERIES
The Tormey Co., 681 Geary St., San Francisco.
W. & J. Sloane, 216-228 Sutter St., San Francisco.

WATERPROOFING (see Damp-proofing)
WATER SUPPLY SYSTEMS
Kewanee Water Supply System—Simonds Machinery Co., agents, 117 New Montgomery St., San Francisco.
Smith-Booth-Usher Co., San Francisco and Los Angeles.

WHEELBARROWS—STEEL
Western Iron Works, Reale and Main Sts., San Francisco.

WHITE ENAMEL
"Gold Seal," manufactured and sold by Bass-Hueter Paint Co. All principal Coast cities.
The Paraflne Companies, Inc., San Francisco, Los Angeles, Portland and Seattle.

WINDOW SASH CHAIN

WINDOW SHADES
W. & J. Sloane, 216 Sutter street, San Francisco.
D. N. & E. Walter, 562 Mission street, San Francisco.

WINDOWS, REVERSIBLE, CASEMENT, ETC.
Crittall Casement Window Co., Detroit; Waterhouse & Wilcox, San Francisco, representatives.
Hauser Window Co., 157 Minna St., San Francisco.

WIRE FENCE
Standard Fence Co., 245 Market street, San Francisco; and 310 12th street, Oakland.
MOTT PLUMBING FIXTURES

Architects and their clients are invited to visit our Showrooms, 553-555 Mission Street, San Francisco; D. H. Gulick, Sales Agent. Los Angeles Office, 603 Central Building; J. R. Mayhew, Sales Agent.

Mott Company of California

MUELLER — BRASS GOODS

Recognized as the Standard of excellence in plumbing. It pays to use them, and other Mueller Brass Goods. The first cost is practically their last cost.

635 Mission Street, San Francisco, Cal.

Winter is Here

Specify STORM KING and AMERICAN WARM AIR FURNACES and insure warmth for your client in his new home

Furnace Fittings and Repairs

Montague Range and Furnace Company
327-329 Jessie Street
Phone Garfield 1422
826-830 Mission Street
San Francisco, Calif.

DON'T NEGLECT YOUR HEATING SYSTEM.
THE BEST IS NONE TOO GOOD!


JAMES A. NELSON
Heating and Ventilating Contractor
Phone, Garfield 1959
517-519 Sixth St., San Francisco

When writing to Advertisers please mention this magazine.
A Word About Japanese Oak Flooring

As an American, as an architect or an engineer, we know you will want to protect your clients against the substitution of inferior Japanese Oak Flooring.

The building public is sometimes misled by an attractive lower price to try out the imported article. It is a costly experiment. Many have been compelled to rip up the Japanese and lay down the American, at great expense.

To the expert eye Japanese Oak Flooring at once betrays its inferiority by its lack of the beautiful "flower" which is characteristic of the American. While it shows its brashy nature by breaking off evenly and usually shows a tendency to warp after laying.

The above trade-mark alone identifies the genuine.

We will be glad to send you our three free booklets, in colors, on the advantages and economies of American Oak Flooring. They contain accurate and valuable information for the files of the architect or engineer. They cost you nothing.

Write Today to

OAK FLOORING MERSALL
Of the United States
1036 Ashland Block, Chicago, Ill.
"Simple—Strong—Efficient"
That's what users say of the

STEWART
Tilting Drum
CONCRETE MIXERS
with
Hercules Engine
drive
And there's one thing more
to add—they're
Reasonably Priced

For sale by
Smith-Booth-Usher Co.
CONTRACTORS and INDUSTRIAL EQUIPMENT
SAN FRANCISCO
50-60 Fremont Street
LOS ANGELES
228-238 Central Avenue
Everything OPENLY PRICED in our Illustrated Priced Stock Bulletin.

Steel Water Tanks
For High Buildings
For high pressure Water Systems, Automatic Fire Sprinklers, etc.

ALSO:
Designers, Fabricators and Erectors of General Plate Work, including Hydro-Pneumatic Pressure Tanks, Hemispherical Bottom Tanks and Towers, Oil and Water Tanks, Pipe Lines, Etc. "Western" Corrugated Culvert Pipe

Western Pipe and Steel Company
OF CALIFORNIA
444 MARKET STREET
SAN FRANCISCO
1758 NORTH BROADWAY
LOS ANGELES

When writing to Advertisers please mention this magazine.
The Architect Can Help

YOU CAN HELP TO SAVE MILLIONS OF DOLLARS ANNUALLY. Plate glass breakage through defective installation is one of your problems.

Such breakage can be eliminated through right construction. Right construction is that which measures up to the following:

**GLAZING SPECIFICATIONS**

All Metal Sash, Corner Bars, Division Bars and Self-Adjusting Setting Blocks Used In Store Fronts Must Be Listed By the Underwriters' Laboratories.

Strict adherence to this specification would mean that millions of dollars would be saved to the insurance companies as well as to the store owners.

All Zouri-Key-Set Sash, Corner and Division Bars and Self-Adjusting Setting Blocks have been listed by the Underwriters’ Laboratories.

Consult Our Nearest Representative

We have 198 distributors in the United States and Canada, each carrying a complete stock of Zouri and International construction.

Ask either of the firms listed below for full particulars of Zouri construction

**COBBLEDICK-KIBBE GLASS COMPANY**

Oakland and San Francisco

**CALIFORNIA PAINT & GLASS CO.**

Los Angeles, California

Zouri Drawn Metals Company

Factories and General Offices:
1632 EAST END AVE.
CHICAGO HEIGHTS, ILLINOIS

When writing to Advertisers please mention this magazine.
ONE of the refinements that gives distinction to the new Sheridan Plaza is the glass used in its windows.

The window glass throughout this hotel is a product of the American Window Glass Co.,

American Window Glass is distinctly a quality product, made to meet exacting requirements both in double or single strength. Its evenness and freedom from imperfections invariably win it preference.

American Window Glass Co.
GENERAL OFFICES, PITTSBURGH, PA.
Branches in leading cities as listed in Sweet's

Pacific Coast Sales Representatives
THE L. H. BUTCHER COMPANY
862 Mission St. - San Francisco, Calif.
923 Santa Fe Ave., Los Angeles, Calif.
1018 Fourth Ave., So. - Seattle, Wash.
624 Henry Building, - Portland, Ore.

SHERIDAN PLAZA HOTEL
Chicago, Ill.
Architect, WALTER K. AHLSCHLAGER
Glazed by SHARP, PARTRIDGE & CO.

STEEL SASH PRODUCTS

Lupton Factory Sash
Lupton Counterbalanced Sash
Lupton School House Sash
Lupton Steel Partition and Doors
Pond Continuous Sash
Pond Operating Device

Represented by
WATERHOUSE-WILCOX CO.
San Francisco Los Angeles San Diego
*J. McCRAKEN CO. H. G. LANAHAN & CO. F. T. CROWE CO.
Portland Spokane Seattle Tacoma

*In Warehouse Stock

When writing to Advertisers please mention this magazine.
SINCERITY

In the olden days of Rome, when the manly toga was quite the thing, street peddlers flourished then as now. Many sold small statues of beautiful Parian marble, the "Lares and Penates," the household gods of the Roman home.

Deception was also practised in those days. Frequently these images of delicate Parian marble cracked, and the pieces had to be cemented together. No self-respecting Roman wanted an inferior piece of workmanship, he demanded the best.

The peddlers then adopted the method of holding aloft their wares, allowing the brilliant sunlight to pass through the translucent marble. If the piece were wholly without blemishes and cementing the pedler shouted "Sin cerno," meaning "wholly separate," or "of one piece." This, then is the forerunner of today's word sincerity.

The growth of W. P. Fuller & Co. is attributable to one cause. And that is the ever-increasing use of Fuller products by architects and others. Fuller products are dependable, because they are marketed under one idea—that of sincerity.

The manufacturers of Fuller Paints and Varnishes do not over-rate what these products will do. They realize that their goods must be exactly as represented. This sincerity has given architects faith when they specify Fuller's.

Pioneer White Lead
Silkenwhite Enamel
Fullerwear Varnish

Fifteen For Floors Varnish
Forty for Finishing Varnish
Fifty For Flatting Varnish

Concreta

W. P. FULLER & CO.
Steam Heating and Ventilating
FOR COMMERCIAL AND PUBLIC BUILDINGS
FURNACE HEATING
FOR THE HOME
Mangrum & Otter, Inc.
827-831 Mission Street, San Francisco
Phone Kearny 3155

S. & S. TILE CO. A. L. SOLON and
E. P. SCHEMMEL
MANUFACTURERS OF
HAND-MADE TILES FOR WALLS AND FLOORS.
REPRODUCTIONS OF OLD SPANISH AND
MOORISH GLAZED TILES.
Factory, 4th and Carrie Sts. San Jose, Cal.

Highest Standard of Quality
Complete and Dependable Service
TROPICO POTTERIES, Inc.
Successors to
PACIFIC MINERALS AND CHEMICAL COMPANY
GLENDALE, CALIF.
ARCHITECTURAL TERRA COTTA
VITRIFIED CLAY SEWER PIPE
TERRA COTTA FLUE LINING
TERRA COTTA CHIMNEY PIPE
FAIENCE TILE
DRAIN TILE
WATER PIPE

GLADDING, McBEAN & CO.
MANUFACTURERS CLAY PRODUCTS
CROCKER BUILDING, SAN FRANCISCO
WORKS, LINCOLN, CAL.

When writing to Advertisers please mention this magazine.
Mr. Frank Goodwillie, New York City, Architect. Waterproofed Medusa Stainless White Cement was used in mortar to set limestone facing of the entire lower half of the structure. Materials furnished by Tomkins Brothers of New York, Newark and Philadelphia.

Medusa Stainless White Cement Mortar WATERPROOFED

Apart from its usefulness as an exclusive structural medium, Medusa Waterproofed Stainless White Cement offers remarkable possibilities as mortar for setting and pointing marble, terra cotta, limestone, tile, face brick, etc. The nature of Medusa Stainless White Cement is to resist discoloration and streaking, not only of the mortar itself, but of the marble, stone, tile, etc. The presence of Medusa Waterproofing in the cement serves to exclude moisture permanently, and to prevent absorption of dirt and grime. Striking effects can be obtained either by making up the mortar in the original whiteness of the cement itself, or by tinting it to any desired shade. Interesting booklets, with concise specifications and other valuable data, gladly sent upon request.

We are sole manufacturers of Waterproofed Stainless White Cement.

THE SANDUSKY CEMENT COMPANY, Dept. P, Cleveland, Ohio
Manufacturers of Medusa Stainless White Cement (Plain and Waterproofed), Medusa Gray Portland Cement (Plain and Waterproofed), and Medusa Waterproofing (Powder or Paste).

PACIFIC COAST DISTRIBUTORS
Riverside Portland Cement Co., Los Angeles, Cal.

STAINLESS WHITE
MEDUSA CEMENT

Waterproofed or Plain
Ford

The Ford car unfailingly answers the needs of the man who desires economical and dependable motor transportation.

The Ford is a valuable ally of the business concern and indispensable to the salesman or the sales force that wishes to cover an extensive territory at the least cost and with the greatest speed.

For eighteen years, we have catered to the needs of the Ford buying public. In our new location and our new building at 11th and Market streets we are in a better position than ever to serve.

Visit our new sales and service quarters. Night service in the garage.

William S. Hughson Co.

Since 1903
Market at 11th St., San Francisco
Park 4380

Seattle  Portland  Oakland  Los Angeles  San Diego
Interior of J. W. Perry's Home, Kansas City

American Oak Flooring

For American Homes

Use the material which has proved its vast superiority in more than One Hundred years' use as America's finest flooring.

Use American Oak Flooring because of its inherent beauty of grain and texture and because of its everlasting durability and economy.

Avoid the use of Japanese oak flooring. It is inferior in grain and texture, is brittle, "brashy" and porous, and of highly questionable value as flooring material.

We are manufacturers of the best American Oak Flooring, and endorse every piece with our own trade mark and that of the Association. Ask for these symbols and play safe.

E. L. BRUCE CO., Manufacturers
MEMPHIS, TENNESSEE
The GOLD MEDAL MAIL CHUTE

INSTALLED IN
THE NEW
SAN FRANCISCO
CITY HALL
AND THE
WHITE MARBLE
MERRITT
BUILDING,
LOS ANGELES

Given highest award at
Panama-Pacific International Exposition, 1915.

Waterhouse-Wilcox Co.
California
Representatives
525 Market Street
SAN FRANCISCO
311 E. 4th Street
LOS ANGELES
F. T. CROWE & CO.
Seattle, Wash.
THE J. MCCRAVEN CO.
Portland, Oregon
American Mailing
Device Corporation

EASY TO LAY
Great quantities of Clinton Electrically Welded Fabric can be laid in a very short time with absolute assurance that every strand of wire is in its proper position. It eliminates all the cost and trouble of spacing and wiring loose rods.

L. A. NORRIS COMPANY
140 Townsend St., San Francisco
Phone Kearney 5375

CLINTON
Electrically Welded Wire Fabric

McCRAVEN REFRIGERATORS
FOR ALL PURPOSES

It is our particular desire to impress the Architects of America with the fact that McCray builds refrigerators for all purposes. Thousands of fine residences, hotels, clubs, restaurants, factory cafeterias, hospitals, stores and markets depend on McCray for efficient, economical refrigerator service.

McCRAVEN REFRIGERATOR CO.
765 Mission Street, San Francisco, Calif.
Home Office and Factory
Kendallville, Ind.

NOT ONLY MIXERS
but a full line of nationally-known equipment, as well.

We have prepared for a brisk building season.

"Get it from BACON"

Edward R. Bacon Company
51-61 Minna Street, San Francisco
165 E. Jefferson St.
Los Angeles

When writing to Advertisers please mention this magazine.
Architects and engineers who conscientiously strive to give their clients satisfaction invariably choose Wayne equipment. Accuracy, dependability, economy, safety and long life are inherent qualities of Wayne gasoline and oil systems. Wayne engineers will gladly co-operate with you in working out any of your problems.

Wayne Oil Tank & Pump Company
746 Canal Street
Ft. Wayne, Ind.

San Francisco Office
633 Howard Street
Phone Garfield 1350

Los Angeles Office
830 S. Los Angeles Street
Phone Main 1600

OIL CONSERVATION SYSTEMS

There is something cheery about a White Cement House that appeals to the owner. Possibly that is why Stucco Homes have grown to be so popular in California in recent years.

Del Monte White Sand
and
Fan Shell Beach Sand
used with a White Cement make a perfect stucco finish.

Del Monte Properties Co.
401 Crocker Building
Phone Sutter 6130
San Francisco

When writing to Advertisers please mention this magazine.
When you buy

REINFORCING STEEL

from this organization you get bars that measure up to the mark plus a service as dependable as the steel itself

Corrugated—Squares—Rounds
Cut To Length
fabricated and installed

444 Market Street
Phone Sutter 2720

Stocks at Warehouse
10th and Bryant Sts.

Faster Work — More Efficiency

Daylight and fresh air insure increased production

Truscon Daylight Sash

provides invigorating air and healthful, cheery sunlight. All sizes of Truscon Steel Sash carried in stock in the San Francisco Warehouse.

Largest stock of fireproof material and reinforcing bars on the Pacific Coast.

TRUSCON STEEL COMPANY
CHAS. HOLLOWAY, JR., Branch Manager
527 Tenth Street, San Francisco

When writing to Advertisers please mention this magazine.
WHERE SERVICE IS PARAMOUNT

R-W "Ideal" Hardware Excels

Safety and simplicity are the two essentials of passenger elevator door hardware. R-W Ideal elevator hardware embodies both essentials to the point of perfection.

The fact that R-W Ideal hardware is gaining in public favor every day is demonstrated in the increasing number of installations. Many of the elevators in America's largest buildings recently completed, or now under construction, are fully equipped with Ideal hardware.

We have practical representatives who will gladly co-operate with architects in the selection of the right elevator door hardware to fit the particular need.

Let us send you our latest catalog (0-2) and complete data relating to Ideal Hardware.

Richards-Wilcox Mfg. Co.

Sewage Ejectors  Bilge Pumps
Condensation Pumps and Receivers
Return Line Vacuum Pumps
Horizontal Centrifugal Pumps

CHICAGO PUMP COMPANY
Telephone: Douglas 4220

GARNETT YOUNG and COMPANY
612 Howard Street, San Francisco

SEATTLE  LOS ANGELES  PORTLAND
PITCHER DOOR HANGERS

Specified in this Apartment House by Mr. A. H. Knoll, Architect, because of their simplicity, quiet running qualities and dependability.

MANUFACTURED BY

National Mill & Lumber Co.
318 Market Street
San Francisco

Phone Kearny 3580

Snow White

- Built with a Clean Smooth Surface. Petrium Sanitary Sinks answer every requirement. They are non-porous, non-absorbent and lye-proof. There are no crevices or corners to catch the dirt and grease. Therefore Specify this sink. Can be installed in any home or apartment—new or old. A California product.

Display at
Hoosier Store, Pacific Bldg., San Francisco

Petrium Sanitary Sink Company
Factory and Office, West Berkeley

When writing to Advertisers please mention this magazine.
Putting One Over on the Other Fellow

Advertisers in The Architect and Engineer have an advantage over non-advertisers in that they know what's going on in the building line long before the information becomes a matter of public record.

The live contractor or material man wants to know about a new building when it is being planned—not when it is part way up.

Close cooperation with leading architects and engineers throughout the Pacific Coast enables the publishers of The Architect and Engineer to furnish their advertisers with a superior Building Report Service that is positively first-hand information—concise, reliable, accurate.

Trial Set of Reports Free on Request

The Architect and Engineer, Inc.

627 Foxcroft Building
San Francisco

Phone Douglas 1828
BUILDING BUSINESS

CALIFORNIA'S OLDEST NATIONAL BANK
HAS BEEN A VITAL FACTOR IN THE UPBUILDING
OF SAN FRANCISCO AND THE ENTIRE WEST.

WHEN LAYING PLANS FOR THE FUTURE OF YOUR
BUSINESS CONSULT THE OFFICERS OF THIS INSTITUTION

THE FIRST NATIONAL BANK OF SAN FRANCISCO
Affiliated with
FIRST FEDERAL TRUST COMPANY
Combined Resources $60,473,521.88

MAGNESITE STUCCO
AND FLOORING

DORITE
MANUFACTURED BY THE
DORITE MANUFACTURING CO.
116 UTAH STREET, SAN FRANCISCO

AGENCIES:
METROPOLITAN BLDG., LOS ANGELES 501 5TH AVENUE, N. Y.

CONTRACTOR'S MACHINERY

OSHKOSH PAVERS OSHKOSH MIXERS
INSLEY GRAVITY PLANTS
OSHKOSH EVEREADY SAW RIGS INSLEY STEEL CARS and TRACK
HOISTING BUCKETS, HOPPERS, GATES, ETC.
STEAM AND ELECTRIC HOISTS

EVERYTHING USED BY CONTRACTORS
CARRIED IN STOCK BY
GARFIELD & CO.
Hearst Building, San Francisco Phone Sutter 1036

RA-DO FUMELESS GAS RADIATORS

ALL CAST IRON—3 Sizes (3, 5, and 7 Sections)
The Ideal "Year-Round" Heating System
For The Home—New or Old
Easiest and Cheapest to Install
Lowest Operating Cost

BAIRD - BAILHACHE COMPANY
MANUFACTURERS
478 Sutter St., San Francisco Phone Sutter 6858

When writing to Advertisers please mention this magazine.
Each shipment of "OLD MISSION" Portland Cement is guaranteed not only to equal but to surpass all requirements of the standard specifications for Portland Cement as adopted by the U. S. Government and by the American Society for Testing Materials. A Guarantee Certificate is mailed with the bill of lading of each car, giving number of car, date packed, and number of barrels, over the signature of the chief chemist.

8000 SACKS DAILY

SALES OFFICE:
MILLS BLDG., SAN FRANCISCO
PHONE SUTTER 3075

PLANT:
SAN JUAN, CAL.
Safeguard your building—be it Factory, Warehouse or Power Plant—against spread of flames by specifying

**FYER-WALL**

**ALL METAL DOORS and SHUTTERS**

Inspected and Labeled by Underwriters' Laboratories

**FIRE PROTECTION PRODUCTS COMPANY**

FIRE DOORS — KALAMEIN — GENERAL SHEET METAL WORK

3117-3119 Twentieth Street, San Francisco

**FIRE PROTECTION PRODUCTS COMPANY**

FIRE DOORS — KALAMEIN — GENERAL SHEET METAL WORK

3117-3119 Twentieth Street, San Francisco

**ECONOMY**

**STRENGTH**

"Bois" System of Metal Stair Construction

Using Interlocking Treads and Risers

ARE USED IN ALL TYPES OF BUILDINGS

Full Information and Estimates Furnished

Manufactured by

**UNITED STATES METAL PRODUCTS CO.**

330 Tenth Street, San Francisco, Cal.

A practical, durable Window Fixture—
easily operated,

Is a delight to the housewife. Equip the windows of your client's home, Mr. Architect, with

**HAUSER**

Reversible Window Fixtures

Manufactured and Installed by

**HAUSER WINDOW COMPANY**

157 Minna Street, San Francisco, Cal.

Business College, Oakland, C.W. McCall, Architect

Telephone, Kearny 3706

When writing to Advertisers please mention this magazine.
BOTH the exterior and interior of the National Bank at Elizabeth, New Jersey, were finished in Napoleon Gray Marble.

This is only one of many such institutions for which we have been called upon to supply the marble.

In the erection of this building, over 3,900 cubic feet of Napoleon Gray Marble were used.

For samples of marble or stone—write to us.
QUALITY HARDWARE

LORBIN
LOCKS AND BUILDERS' HARDWARE

PALACE HARDWARE CO.
"San Francisco's Leading Hardware Store"
551 Market Street. Sutter 6060

Kewane Water System

Simonds Machinery Co.
117-121 New Montgomery St.
San Francisco
Phone Kearny 1427

UHL BROS.
San Francisco
Oakland
Seattle
Los Angeles
Portland
Pacific Coast Distributors
Murphy Varnishes and Enamels

For
Hotels
Apartment Houses
Hospitals
Factories
Etc.

Barreled Sunlight

Pack your Radiator Valves with
Palmetto Twist Packing
It can be unstranded to fit any size valve. It does not get hard.

H. N. COOK BELTING CO.
401-433 Howard St. San Francisco, Cal.

When writing to Advertisers please mention this magazine.
Over 300 Banks in California are using

**Western Venetian Blinds**

Used extensively in Schools, Office Buildings, Public Buildings, Residences, etc.

**WESTERN BLIND & SCREEN CO.**

*Factory and General Office, 27th and Long Beach Avenue, Los Angeles, Cal.*

*Sold by C. F. WEBER & CO., San Francisco. Also by E. C. DEHN, 921 Hearst Bldg., San Francisco.*
Fuller & Goepp
32 Page Street, San Francisco
Telephone Market 499
MANUFACTURERS OF
ART AND LEADED GLASS
MIRRORS
Dealers in WHITE Glass for Table Tops, Counter Tops, Sink Backs, Etc. Complete Stock—Prompt Deliveries
Oakland Office, Syndicate Bldg. Tel. Oakland 1165

CANNON & CO.
Clay Products
Denison Interlocking Tile
Face Brick
Hollow Tile
Roof and Floor Tile
Factory and General Offices:
SACRAMENTO, CALIFORNIA

When writing to Advertisers please mention this magazine.
Specify **Bowser**

THE latest Bowser Piston-Type Measuring Pump (illustrated) is either hand or air-driven and exemplifies the high standard of service set by Bowser Equipment.

The motive power being air, the usual fire hazard in handling gasoline by power is eliminated.

Bowser Equipment accurately, economically and safely meets all requirements for gasoline and oil storage and service.

Whether it is in a garage, railroad, factory or dry cleaning plant, you are best serving your clients when you specify Bowser Equipment.

*Write for Illustrated Booklet A-03*

**S. F. Bowser & Company, Inc.**

1303 Creighton Ave., FORT WAYNE, INDIANA

Sales Offices (with Service Departments) throughout the United States and in Principal cities of the World.

612 Howard Street, 1225 So. Olive Street,
San Francisco, Calif. Los Angeles, Calif.

LONDON PARIS HAVANA SYDNEY

---

**CRITTALL**

*Steel Casements*

for artistic residences and other substantial buildings

*Made in varied designs to meet all conditions*

Crittall Casement Window Co., *Manufacturers*

DETROIT

---

When writing to Advertisers please mention this magazine.
Ray Rotary Fuel Oil Burners

For Steam and Hot Water Boilers

ADAPTED TO ANY TYPE OF BOILER OR FURNACE—High or Low Pressure, 10 to 300 H. P.

We pioneered and developed the horizontal type Rotary Burner. This principle is sound, as the trend of all burner design is toward this type.

Don't confuse the Ray with other Rotary Burners.

We are the largest manufacturers of Rotary Burners in the world. Recent contracts of the Westinghouse Electric Manufacturing Company covered over four thousand motors.

The Ray Oil Burning system is covered by twenty United States Patents.

This represents ten years of research and development work.

Can you afford to buy experiments—just born?

No matter what your troubles are we can eliminate them with the Ray system.

We guarantee the Ray to be the most efficient burner on the market.

W. S. RAY MANUFACTURING CO.

Manufacturers of Ray Crude Oil Burners
Ray Oil, Gas, Coal or Wood Heavy Steel Ranges

OFFICE AND SALESROOM:
29 Spear St., SAN FRANCISCO
Phone Kearny 199

PLANT AND SERVICE:
Bosworth, Milton and S. P. R. R.
Phone Mission 5022

OAKLAND AGENCY:
The Ray Oil Burning Systems
F. L. Warner, Manager
696 20th Street, Oakland, Calif.
Phone Oakland 3944

AGENCIES
in all principal cities

GENUINE SQUIRES STEAM TRAPS

Great Durability and High Efficiency.
Main joints above water line.
Valve and Seat accessible without breaking joints.
Every Trap unconditionally guaranteed.

W.E. MUSHERCO

SOLE AGENTS
Phone Sutter 4797

502 Mission Street
San Francisco, Cal.

ARCHITECTS - BUILDERS - CONTRACTORS

MODERN CONDITIONS practically DEMAND gas heating.
Be fore-handed and include provision for the use of GAS HEATING APPLIANCES in your plans and construction program. If an estimate on a complete heating system will help, do not hesitate to call on us.

Pacific Gas and Electric Company

When writing to Advertisers please mention this magazine.
FESS SYSTEM TURBINE FUEL OIL BURNER

"Worthy of your consideration"

We are the originators of the mechanical atomizing type oil burner and the largest exclusive manufacturers of oil burning equipment in the west. All parts of our equipment are manufactured in our own plant, thereby assuring prompt and efficient service at all times.

Specify "FESS SYSTEM"—it has no equal

FESS SYSTEM COMPANY, Inc.
218-220 Natoma St., San Francisco. Phones Sutter 6927-6928.

Agencies in all principal cities.

Member of the Oil Burners Manufacturers’ Association of California.

SIMPLEX BURNERS


BUNTING IRON WORKS

1215 FIRST NATIONAL BANK BLDG. SAN FRANCISCO Phone Sutter 3225

Member of the Oil Burners Manufacturers’ Association of California.

OIL BURNER EQUIPMENTS

Low Pressure Air and Rotary Mechanical Atomizing Types

Refrigerating and Ice-Making Machines

Direct Expansion and Brine Circulating Systems

T. P. JARVIS MANUFACTURING CO.

CONTRACTING ENGINEERS AND MANUFACTURERS

275 Connecticut Street, San Francisco Phone Market 3397

Member of the Oil Burners Manufacturers’ Association of California.

JOHNSON’S ROTARY CRUDE OIL BURNER

Can be installed in any BOILER or FURNACE

Gives Satisfactory Results. Simple to Operate—Automatic—Safe. Let us tell you more about this Oil Burner.

S. T. JOHNSON CO.

1337 Mission Street - San Francisco, Cal. Phone Market 2759

Agencies: SEATTLE LOS ANGELES FRESNO SAN DIEGO SACRAMENTO

Member of the Oil Burners Manufacturers’ Association of California.
Pump Governors  
Oil Burner Governors  
Reducing Valves  
Safety Valves  
Oil Valves  
Blowoff Valves  
Boiler Feed Water Regulators

Oil Pumping Sets  
Little Giant Improved Oil Burners  
Duplex Oil Pumps  
Rotary Oil Pumps  
Oil Heaters  
Draft Gauges  
Boiler Feed Pumps

G. E. WITT CO., Inc.  
ENGINEERS  
Manufacturers and Distributors

862-864 HOWARD ST.  
Phone Douglas 4404  
SAN FRANCISCO, CAL.

"The recollection of QUALITY remains long after the price is forgotten."  
E. C. Simmons.

PACIFIC MATERIALS CO.  
525 MARKET STREET  
SAN FRANCISCO

A. F. Edwards, Pres.  
J. M. Fabbris, Vice-Pres.  
J. A. Mackenzie, Secy.

Office Telephone:  
MARKET 5070

Chas. F. Eisele, Asst. Mgr.  
J. Rubiolo, Asst. Mgr.  
D. A. Batsford, Asst. Mgr.

AMERICAN MARBLE & MOSAIC CO.  
25-59 Columbia Square, San Francisco, Calif.  
Near Folsom St., Bet. 6th and 7th Sts.  
Factory on Waterfront, South San Francisco.  Phone South San Francisco 161

DETROIT STEEL PRODUCTS CO., Detroit  
Direct Factory Branch, 68 Post Street, San Francisco  
Phone Sutter 1250

When writing to Advertisers please mention this magazine.
THE ARCHITECT AND ENGINEER
CONTENTS FOR FEBRUARY, 1922

Entrance From Building Rotunda, First
National Bank, San Francisco . . Frontispiece
Charles E. Gottschalk, Architect

The First National Bank of San Francisco . 47
Frederick Hamilton

Co-operation Between the Architect and the
Mechanical Engineer . . . . . . . . . . . . . . . 74

Competition for St. John's Church, Los
Angeles . . . . . . . . . . . . . . . . . . . . . . . . . . 75

Burnham, Master City Planner . . . . . . . . . . . . 99
Edward F. O'Day, Editor

Joint Convention of Idaho Architects and
Engineers . . . . . . . . . . . . . . . . . . . . . . . . . . 102

In Favor of Quantity Survey . . . . . . . . . . . . . . . . . 105

Editorial . . . . . . . . . . . . . . . . . . . . . . . . . . 106

With the Architects . . . . . . . . . . . . . . . . . . . . 109

With the Engineers . . . . . . . . . . . . . . . . . . . . 113

The Contractor . . . . . . . . . . . . . . . . . . . . . . 116

Book Reviews . . . . . . . . . . . . . . . . . . . . . . . 124

Published Monthly by
The Architect and Engineer, Inc.
626-27 Foxcroft Building, San Francisco

W. J. L. Kierulf Frederick W. Jones L. B. Fenimorewood
President Vice-President Secretary
ENTRANCE FROM BUILDING ROTUNDA, FIRST NATIONAL BANK, SAN FRANCISCO, CHARLES E. GOTTSCALK, ARCHITECT
The First National Bank of San Francisco

By FREDERICK HAMILTON

SAN FRANCISCO'S oldest National Bank is the most recent to install itself in new quarters. With the completion of the additions to the First National Bank building at the corner of Post and Montgomery streets, the Bank enters spacious and sumptuous quarters which embody the latest developments in banking organization and equipment, while the affiliated First Federal Trust Company, hitherto confined within an area which now becomes no more than a vestibule to the new building, takes possession of the entire area formerly occupied by the parent organization.

The First National Bank of San Francisco is one of California's oldest banking institutions, and was founded by figures prominent in the State's early financial history. It was organized on October 20, 1870, in the Exchange Building, now the Merchants' Exchange Building, on California street. A charter was obtained from the Government, and the bank opened for business on January 3, 1871, under the name of the First National Gold Bank. The original quarters were at 403 Montgomery street. A few years later the institution moved into the Nevada building, and occupied the corner at Montgomery and Summer streets.

The Bank's first president was Mr. James Phelan (father of former Senator Phelan), and the original board of directors was as follows: Messrs. James Phelan, D. Driscoll, C. G. Hooker, J. B. Felton, M. P. Jones, D. D. Colton, James Moffitt, C. F. Mac Dermott, Edward Martin, D. Callaghan, N. Van Bergen, Samuel Hort, J. C. Flood, J. H. Wise, X. K. Masten, George F. Hooper.

The second president was Mr. George F. Hooper, the father of Mr. J. G. Hooper, manager of the First Federal Trust Company. One of the first cashiers was Mr. R. C. Woolworth. He was later made president, and remained with the First National Bank for seven years. He then resigned and organized the firm of Crocker, Woolworth and Company, Bankers. Mr.
D. Callaghan was elected to fill the vacancy of president. He remained president for five years, and was followed by Mr. S. G. Murphy.

In 1889 the Bank built a new home at the corner of Bush and Sansome streets, on the present site of the Standard Oil building. This building was occupied until 1909, when the present structure at the corner of Post and Montgomery streets was completed.

In 1907 the First Federal Trust Company was organized by the stockholders of the First National Bank, and occupied a portion of the Bank's new building. The growth of the First Federal Trust Company was rapid until after the purchase of the Mutual Savings Bank, one of San Francisco's oldest banking institutions, its quarters became quite inadequate. The board of directors therefore purchased one hundred feet of land adjoining the building throughout its length from Montgomery street to Lick place, and erected thereon an annex as a new home for the First National Bank, while the First Federal Trust Company occupies the quarters from which the Bank has withdrawn.

Mr. Charles E. Gottschalk was entrusted with the designing of the new First National Bank. At its inception this task was beset with a perplexing decision between alternatives which would not be encountered in out-and-out new work. The new building was to be a two-story addition to a twelve-story structure previously designed by Willis Polk and Company, joining the old building on the Montgomery street facade, on the exterior
rotunda and on the interior elevator lobby. Three courses of procedure were open: the original design might be entirely disregarded except at the actual points of contact; the essential lines and large elements of the old building might be maintained without prejudice to a complete freedom in handling; or the entire existing architectural apparatus might be adopted in toto.

On its face the second alternative would seem to point the most promising course; although it would be impossible, without a knowledge of many circumstances denied an outsider, to say that Mr. Gottschalk was wrong in choosing the third. There may have been practical considerations making it the most expedient policy; or there may have been sentimental reasons dictating an architectural treatment identical with that long associated with the Bank, and still maintained in the affiliated institution across the lobby. On the exterior the result is not entirely happy. Whatever the merits of the facade as a facade, its junction with the tall building is not altogether convincing. The sturdy two storied base, slipping out into the open from under ten stories of office building, gives the impression that it is only waiting its turn for a similar superposition. The interior is splendid. It has an air of pomp and sumptuousness befitting an important institution of its kind; it has, above all, a sense of spaciousness and airiness which is refreshing. One feels free to walk in more than one direction, and able to breathe amply while doing it.
On the technical side the new bank represents the most modern development in banking organization and equipment. The open officers' island in the midst of the public space is the first example in the West of an arrangement which has found favor in recent Eastern banks. The same is true of the layout of the receiving and paying wickets into three units segregated alphabetically—in effect three independent banks. This arrangement, which will be readily understood by reference to the plan on page 59, has the advantage of reducing to one third the number of people with whom any one teller must deal. No operating equipment whatever is housed on the first floor. All work, save that in which the public is actually involved is done on the second floor, entirely out of the public view. All work is carried from the windows on the main floor by pneumatic tubes to a central or receiving department on the second floor, where it is proven and sent on to the proper departments, which are arranged in orderly sequence, interior on one side and outgoing on the other. The careful and logical arrangement of the work departments will be understood from the layout on page 58.

The Bank provides a lunch room for employees who desire to use it, and also club rooms where the latest periodicals on education and financial matters can be found. The employees take care of their own welfare work through the medium of the First National Bank Club. All officers and directors of this club are elected by the staff from its own membership, but one officer of the Bank is allowed to sit upon the board. A house organ known as "Eleven-Eight" (the transit number of the First National Bank) is published at intervals, containing items of interest about the staff and as a rule one or two educational articles.
PRESENT AND FORMER HOMES OF THE FIRST NATIONAL BANK OF SAN FRANCISCO
CEILING PLAN, FIRST NATIONAL BANK OF SAN FRANCISCO
CHARLES E. GOTTSCALK, ARCHITECT
CEILING DETAIL

CENTRAL SKYLIGHT DETAIL. FIRST NATIONAL BANK OF SAN FRANCISCO
Charles E. Gottschalk, Architect
LAYOUT OF WORK SPACE, SECOND FLOOR,
FIRST NATIONAL BANK OF SAN FRANCISCO
LAYOUT OF PUBLIC BANKING ROOM, FIRST FLOOR, FIRST NATIONAL BANK OF SAN FRANCISCO
NIGHT LIGHTING, FIRST NATIONAL BANK OF SAN FRANCISCO. CHARLES E. GOTTSCALK, ARCHITECT
ASSISTANT CASHIER'S ISLAND, FIRST NATIONAL BANK OF SAN FRANCISCO. CHARLES E. GOTTSCALK, ARCHITECT
EXECUTIVE PLATFORM, FIRST NATIONAL BANK OF SAN FRANCISCO.

CHARLES E. GOTTSCALK, ARCHITECT
WRITING COUNTERS AND EXECUTIVE PLATFORM, FIRST NATIONAL BANK OF SAN FRANCISCO.

CHARLES E. GOTTSCALK, ARCHITECT
BANK SCREEN AND WRITING COUNTER, FIRST NATIONAL BANK OF SAN FRANCISCO.

CHARLES E. GOTTSCHALK, ARCHITECT
CASHIER'S DESK, FIRST NATIONAL BANK OF SAN FRANCISCO
CHARLES E. GOTTSCALK, ARCHITECT
MONTGOMERY STREET ENTRANCE, FIRST NATIONAL BANK OF SAN FRANCISCO. CHARLES E. GOTTSCALK, ARCHITECT
MONTGOMERY STREET ENTRANCE, FIRST NATIONAL BANK OF SAN FRANCISCO. CHARLES E. GOTTSCHALK, ARCHITECT
CLEARING HOUSE

AUDITING DEPARTMENT, FIRST NATIONAL BANK OF SAN FRANCISCO
MAILING DEPARTMENT

CAGE IN WORK SPACE, FIRST NATIONAL BANK OF SAN FRANCISCO
Cooperation Between the Architect and the Mechanical Engineer

"A wise old owl sat on a limb
The more he saw the less he said
The less he said the more he heard
Why can't you be like that old bird?"

A CURIOUS bit of nonsense, isn't it? Perhaps it isn't even quoted correctly. And it doesn't mean anything—or does it? Possibly the author really did have a thought to express and took this way of doing it. But whether he did or not, it has no bearing on the subject of cooperation between the architect and the engineer.

What is the relation between these two? They meet on the street or in the club, speak, and part, each to go about his own line of work—the architect to take a pile of lumber, a few bricks, a little cement, etc., and make a building of them; the engineer to put into that building a little plumbing, a little heating equipment and a little electric wiring and to aid in making it a habitable structure. The architect and the engineer together have, by their skill, transformed the raw materials into a beautiful and comfortable building, to reflect great credit on each of them.

Perhaps the architect could have done as much alone. But, could he have done it as well? Primarily, his work lies in designing and erecting a structure which is harmonious and pleasing to the senses,—his training has been along these lines, rather than along the more utilitarian lines followed by the engineer. It is difficult for him to combine these lines of work,—his time is too much occupied, and rightly, in attaining the desired end architecturally to permit the proper consideration of engineering problems, and they are necessarily slighted. It is here that the engineer can be of great help, for, working with the architect, he can give to the engineering questions the study which they require and can evolve a solution which will harmonize with the architectural design. Each is learning more and more that his line of work is only a part of the whole and that the work of his associate is as essential as his own. Moreover, each feels that he needs the other, that he is unable, alone, to achieve the results desired. This feeling has now passed out of the formulative stage and the wholesome respect which each has for the work of the other, is growing stronger day by day. It will inevitably lead to a fuller understanding and closer cooperation between the architect and the engineer in advancing building design and construction.—Chicago Association of Consulting Engineers, in the Illinois Society of Architects' Monthly Bulletin.

* * *

Medium Cost Homes

AN increasing demand for low and medium-priced homes prompts The Architect and Engineer to devote more space to illustrating houses and bungalows in this class. Commencing in March, this magazine proposes to publish monthly, without comment, several houses ranging in cost from $5,000 to $15,000. Perspectives, elevations, plans and views taken after completion will be shown, and architects are invited to contribute any interesting designs which they have built. Photographs are desired from different localities and all forms of construction, either frame, concrete, brick, adobe or hollow tile, will be acceptable. A wide variance of style naturally will add interest and value to the contributions.
Competition for St. John's Church, Los Angeles

During the latter part of 1921 an important competition was held in Los Angeles for the selection of an architect to design a new building for St. John's Church. The competition was conducted with Mr. Edwin Bergstrom as professional advisor, and limited to the following invited architects: Messrs. Allison & Allison, Los Angeles; Pierpoint and Walter S. Davis, Los Angeles; Robert D. Farquhar, Los Angeles; Lyman Farwell, Los Angeles; Reginald Johnson, Pasadena; Montgomery & Nibecker, Los Angeles. Mr. Farwell subsequently withdrew.

The complete drawings of each of the remaining five competitors are here reproduced. The pertinent portions of the program, together with the report of the jury, are also reprinted, in order to render possible an intelligent study of the drawings.

**ARTICLE I.**

The St. John's Church proposes to erect for its own use a group of buildings, consisting of three principal units—a Church, a Rectory and a Parish House, and the building, rooms and passages supplementary and appurtenant thereto as hereinafter described on its property at the southeast corner of Figueroa and West Adams streets.

**ARTICLE II.**

The owner, not having funds in hand nor in immediate prospect sufficient to complete the entire group of buildings at the present time, will adopt a plan which correlates all units of said group, but will devote its funds in hand to the erection of the Church unit only, together with the appurtenant rooms and passages which are a part thereof, and which are more fully described in Section 5 of Article 16. No other buildings or part thereof will be erected at present.

**ARTICLE 16.**

Section 4. Toilet facilities and other accessories, stacks, stairs and other minor parts where not fixed in this Article 16 are left to the discretion of the competitor, but it is essential that ample provision be made therefor.

Section 5. The essential requirements of the Church unit are as follows, to-wit:

(a) It is mandatory that there be a basement of sufficient size to contain a:

(a-1) A boiler or furnace room of sufficient size to contain heating and fuel equipment for the entire Church unit, but the equipment is not to be shown.

(a-2) A room for storage purposes containing approximately 1250 sq. ft. of floor area.

(b) It is mandatory that the Church proper shall be of nave and transept form and that the appurtenant rooms and parts (b-1) to (b-11) inclusive shall be provided.

(b-1) Mortuary Chapel—To seat 10 to 20 people, with altar and casket space in front of altar.

(b-2) A Memorial Chapel—To seat 90 to 110 people, with an altar and communion rail.

(b-3) One choir room for 20 men, with lockers and toilet.

(b-4) One choir room for 20 women, with lockers and toilet.

(b-5) One choir room for 20 boys, with lockers and toilet.

(b-6) One acolyte room for 40 boys, with lockers and toilet.

(b-7) One altar guild room for arranging flowers, trimming of candles, keeping of altar hangings, and the polishing of brasses, etc.; rooms shall have storage closets thereof; area, exclusive of closets, approximately 120 sq. ft.

(b-8) One sacristy of clear floor area not less than 10 feet by 10 feet.

(b-9) One high altar which shall be at least nine steps above the floor of the nave.
(b-10) A chancel (which shall not be a recess or apse-chancel) to seat 40 to 60 of a choir.
(b-11) An organ loft.
(b-12) It is desired to seat at least 750 people in the nave of the Church, but it is MANDATORY that every seat in the nave shall have a full view of the altar. A balconé at rear of the nave will be permitted.

Section 6. The essential requirements of the Parish House unit are as follows, to-wit:
(a) The Parish House unit will eventually contain:
   (a-1) Assembly hall to seat 400 to 500 people.
   (a-2) Gymnasium, which may be incorporated in Assembly hall.
   (a-3) Kindergarten room for 75 children.
   (a-4) Kitchen to serve Assembly hall and Kindergarten.
   (a-5) Club rooms for billiards, cards and reading.
(b) It is mandatory, that the cubical contents of this unit as described in paragraph (a) to (a-5) of this section shall not exceed 250,000 cu. ft.
(c) It is a mandatory requirement that no interior arrangements of this unit shall be shown, and the rooms listed in (a) hereof are described only for the purpose of aiding the competitors in formulating the area and mass of the unit.
(d) It is not essential that this unit be limited to one story.

Section 7. The essential requirements of the Rectory unit are as follows, to-wit:
(a) The Rectory unit will eventually contain:
   (a-1) Living room.
   (a-2) Dining room.
   (a-3) Kitchen.
   (a-4) Six (6) bedrooms.
   (a-5) Three (3) bathrooms.
(b) It is mandatory, that the cubical contents of this unit shall not exceed 60,000 cu. ft.
(c) It is a mandatory requirement that no interior arrangements of this unit shall be shown, and the rooms listed in (a) hereof are described only for the purpose of aiding the competitor in formulating the area and mass of the unit.
(d) It is not essential that this unit be limited to one story.

Section 8. The supplementary buildings and their essential requirements are as follows, to-wit:
(a) It is mandatory, that there shall be not less than ten Sunday School class rooms, each for twelve to fifteen pupils; these class rooms may also be used as guild rooms.
(b) It is mandatory, that there shall be three apartments for living purposes. One for the sexton, one for the deaconess and one for the curate; two of the apartments shall be of three rooms each, and one apartment of four rooms.
(c) It is mandatory, that there shall be a library, study and office room with general waiting room—total floor area approximately 750 sq. ft.
(d) The supplementary buildings under (a) and (b) of this section may be placed within the Parish house unit as a part thereof, or may be distributed upon the property, with proper connectives, at the option of the competitor. If placed within and as a part of the Parish house unit, the cubage of the Parish house unit must be correspondingly increased. The supplementary buildings under (c) of this section may be placed so as to connect with the Rectory unit or otherwise may be placed on the property with the proper connectives at the option of the competitor.
(e) The property not belonging to St. John's Church at the northeast corner of South Figueroa and West 27th streets may have buildings erected thereon, the character of which may not be in harmony with the group of buildings proposed for the Church. It is, therefore, desired to obliterate this possibility as much as possible by the grouping of the buildings on the Church property or by some method, other than planting, to be suggested by the competitor. A fence between the property cannot be over six feet in height.
West 27th street at Figueroa is a minor street and unimportant, and any of the buildings of the Church group may or may not be brought to the property line on said street, at the option of the competitor.

Language is inadequate to convey a dream, but that the competitors may know something of what is in our mind, this paragraph is added to the agreement:

We are hoping in the erection of the new Church to have a building which will express the warmth of the love of God and fellowship. The old cathedrals of Europe are wonderful because they express the mind of the builders who dreamed of the greatness and majesty and might of God. When one enters them, he is impressed with the spaciousness of the cathedral and the greatness of God and his own littleness. One is made to feel a very small human being and he feels alone. We hope that our Church may make one feel an atmosphere of worship; that he will feel immediately at home when he enters the building and somehow feel the love of the Father.

Just how this can be expressed in stone is difficult to say. That must be left to the ingenuity of the architect. We have suggested the cruciform as the foundation affording transepts. This will in a sense carry out the Anglican tradition of the Church. The transept may be deep or shallow. We are more concerned with the acoustics than we are with the style of architecture.

The Spanish or Mission style of architecture has been appropriated largely by the Roman Catholic Church of Southern California. We have no desire to take it from them by using it. If some means of a combination of Romanesque and Gothic can be worked out we should be gratified. We would like the stranger as he passes by and looks at the Church to have it suggest to him that this Church is not a Roman Catholic Church, but is an Episcopal Church. These are merely suggestions and are offered only with the thought in mind of conveying to the competitors something that is in the mind of the Rector and Vestry.

Report of Jury of Award.

The jury chosen by St. John's Church to select an architect for the new building met in full session, together with the professional adviser, on Wednesday, October 19, 1921, and Thursday, October 20, 1921, as required by the programme.

When the packages of drawings were examined it was found that only five of the invited competitors had submitted designs.

After proceeding to ascertain that all of the drawings had complied with all of the mandatory requirements, the merits of the various designs were discussed at length.

The method of procedure in studying the drawings was as follows:

1st. The group plan in its relation to the site.
2nd. The plan and arrangements of the Church unit proper.
3rd. The study of the designs of facades and sections.

Having considered all of these matters, separately, in detail and collectively, the jury proceeded to vote by secret ballot. One ballot was cast, resulting in the unanimous choice of the design tentatively marked number four. On opening the sealed envelopes, the successful design was found to be that of Messrs. Pierpont and Walter S. Davis.

The jury feels that the Messrs. Davis took the greatest advantage of the limitations of the site. The Church is the dominating feature of the composition on Adams street; it is retired from traffic, and flanked by the Parish House and Rectory, which form a charming forecourt, and place the Parish House in a convenient location on Figueroa street. The requirements for light and air have been solved with the maximum advantage.

The Church unit plan is compact and convenient and complies well with the requirements stated in the programme.

The winning design is very pleasing and harmonious, the chief elaboration being placed upon the Adams street facade, while the other facades (which in the future may be little seen) are treated with great simplicity.

In making the award the three members of the jury affirm that the identity of the authors of the drawings judged was unknown to them.

ERNEST COXHEAD.
WM. TEMPLETON JOHNSON,
REV. GEO. A. DAVIDSON.
Winning design—front elevation and cross section.
Competition for St. John's Church, Los Angeles, Cal.

WINNING DESIGN—SIDE ELEVATION AND LONGITUDINAL SECTION. PIERPONT AND WALTER S. DAVIS, ARCHITECTS
Competition for St. John's Church, Los Angeles, Cal.

WINNING DESIGN—PLAN OF CHURCH
PIERPONT AND WALTER S. DAVIS, ARCHITECTS
Competition for St. John's Church, Los Angeles, Cal.

WINNING DESIGN—BLOCK PLAN AND ELEVATIONS
PIERPONT AND WALTER S. DAVIS, ARCHITECTS
Competition for St. John's Church, Los Angeles, Cal.

FRONT ELEVATION AND CROSS SECTION
ALLISON AND ALLISON, ARCHITECTS
Competition for St. John's Church, Los Angeles, Cal.
Competition for St. John's Church, Los Angeles, Cal.

BLOCK PLAN AND ELEVATIONS
ALLISON AND ALLISON, ARCHITECTS
Competition for St. John's Church, Los Angeles, Cal.

FRONT ELEVATION AND CROSS SECTION
ROBERT D. FARQUHAR, ARCHITECT
Competition for St. John's Church, Los Angeles, Cal.

SIDE ELEVATION AND LONGITUDINAL SECTION
ROBERT D. FARQUHAR, ARCHITECT
Competition for St. John's Church, Los Angeles, Cal.

BLOCK PLAN AND ELEVATIONS
ROBERT D. FARQUHAR, ARCHITECT
Competition for St. John's Church, Los Angeles, Cal.

FRONT ELEVATION AND CROSS SECTION
REGINALD D. JOHNSON, ARCHITECT
Competition for St. John's Church, Los Angeles, Cal.

BLOCK PLAN AND ELEVATIONS
REGINALD D. JOHNSON, ARCHITECT
Competition for St. John's Church, Los Angeles, Cal.

FRONT ELEVATION AND CROSS SECTION
MONTGOMERY AND NIBECKER, ARCHITECTS
Competition for St. John's Church, Los Angeles, Cal.

SIDE ELEVATION AND LONGITUDINAL SECTION
MONTGOMERY AND NIBECKER,    ARCHITECTS
Competition for St. John's Church, Los Angeles, Cal.

Plan of Proposed Church
Montgomery & Nibeker, Architects
Competition for St. John's Church, Los Angeles, Cal.

BLOCK PLAN AND ELEVATIONS
MONTGOMERY AND NIECKER, ARCHITECTS
Increasing Efficiency of Chimneys and Fireplaces

THE fireplace is the heart of the home—and yet, how many smoky fireplaces there are driving their disgusted possessors to less picturesque but more efficient ways of keeping warm. The smoky fireplace and the unsatisfactory operation of other heating arrangements are often due to a poorly constructed chimney, the United States Department of Agriculture points out in a new Farmers' Bulletin, No. 1230, "Chimneys and Fireplaces, How to Build Them," by Mr. A. M. Daniels of the Bureau of Public Roads. The common faults in chimney construction are discussed in detail, and exact directions are given for building chimneys of suitable dimensions and materials.

Good draft in the chimney is necessary to efficient operation. Attention is especially drawn to the fact that a chimney must extend about two feet above the ridge of the house if it is to have a good draft. All chimneys should rest on masonry foundations in the ground. The shape and size of the flue are very important. Round flues are to be preferred, but rectangular ones are usual.

The problem of the smoky fireplace is also dwelt upon from the standpoint of fireplace construction. The need for a throat equal in area to the area of the flue is explained, and emphasis is laid on the importance of a smoke shelf about 8 inches above the throat of the fireplace.

An entirely new application of a simple heating principle in connection with fireplaces was patented by Mr. Joseph Parsons, of Lakeville, Conn., and the patent afterwards assigned by him to the United States government. Instead of supplying the fire with oxygen from the cold air flowing in through cracks around windows and doors, the inventor suggested making the house as air-tight as possible and supplying the necessary oxygen through a special opening in the chimney, placed in such a way that the incoming air would be warmed by passing over and around the fire. An extension of this idea is the provision of an extra warm-air flue which would carry fireplace heat to a register in the coldest part of the room.

Particulars of constructing an ordinary fireplace properly, and for installing a warm-air flue for improved fireplace heating, are described in the Bulletin, which may be obtained upon application to the Department of Agriculture, Washington, D. C.

* * *

Tribute to American Architecture

PROF. C. H. REILLY, of the School of Architecture, Liverpool University, has just paid a tribute to American architecture which he said is purer and more stable than that of England. "America does not seem to be swept as our country has been by fashions set by individual contemporary architects," he said. "American architecture has been, in the last thirty years, less self-sufficient and less insular than British.

"The American architect deliberately seeks his inspiration in the work of the Italian, French and Spanish renaissance. One has no fear that Fifth avenue will at any moment be spoiled by a glazed terra cotta building, with grotesque German detail, yet, who can say the same of Oxford street or the Strand, or any leading London thoroughfare?"

* * *

The Harmonious Home

Interior decoration cannot be undertaken in a haphazard manner nor can it be accomplished, when "fads and fancies" form the dominant note. Artists, decorators and designers of wide experience are co-operating to make the home one of "harmonious good taste."
Burnham, Master City Planner

By EDWARD F. O’DAY, Editor Burnham Plan for San Francisco

The choice of Mr. Charles Moore to write the authoritative biography of Mr. Daniel H. Burnham is as happy in the outcome as it was in the inspiration, for the literature of the fine arts has been enriched by two monumental volumes conceived in sympathy, brought forth with the labor of love and destined to be for all time a living force in American Architecture and City Planning.

Mr. Burnham was the first chairman of the National Commission of Fine Arts; Mr. Moore now occupies that important position. Mr. Moore was private secretary to Senator McMillan of Michigan when that statesman of high ideals and keen vision fathered the bill creating the Washington Plan Commission and other enlightened legislation designed to develop a national art consciousness in the United States. His resultant association with Burnham was long and intimate. The country is deeply indebted to him for this work, wherein a great American is fittingly commemorated and interpreted.*

Burnham the Architect lives in these pages as in his buildings all over the country—a pathfinder, a genius, an artist who knew how to translate his dream into the practicalities of a business age. But it is Burnham the City Planner who here captures the imagination and compels the admiration of the layman.

The gods were good to the United States when they ordained that Mr. Burnham should be Chief of Construction of the World’s Columbian Exposition at Chicago. For Mr. Burnham was inspired to give the country its first great lesson in the cooperation of artists for public service. As Charles Moore writes in his preface: “It was a glorious company that fought under his leadership—McKim, Saint-Gaudens, the Olmsteads, Frank Millet, Theodore Thomas are but typical names.” The influence of that great lesson was a living force in San Francisco more than twenty years later, when another great group of artists cooperated to make an even greater world’s fair, the Panama-Pacific International Exposition.

Mr. Burnham emerged from the Chicago project with ideals which led him by deliberate, sure steps to the highest expression of which he was capable as a patriotic American artist conscious of his duty to his country. His ideals led him to city planning. His ideals are expressed forever in the plans he formulated for Washington, Manila, Cleveland, San Francisco and Chicago. Mr. Burnham himself declared that the inception of great planning of public buildings and grounds in the United States was in the Chicago Fair. “The beauty of its arrangement and of its buildings,” he said in 1910, “made a profound impression not merely upon the highly educated part of the community, but still more perhaps upon the masses, and this impression has been a lasting one. As a first result of the object lesson the government took up the torch and proceeded to make a comprehensive plan for the future development of the capital. Since then every considerable town in the country has gone into this study, and there are many hundreds of plan commissions at work at the present time throughout the United States.” He might have added in the words of Aeneas: Quaeque ipse vidi et quorum pars magna fui.

This city planning movement got under way about 1900. It was ten years old and growing vigorously when Professor Beresford Pitt captured its spirit in an admirable sentence spoken at the city planning conference.

in London, in which Mr. Burnham was a distinguished participant. Professor Pitt said:

“The glory of a city is its grandeur: the gracious width of its streets, the adjusted proportions of its squares, and accompanying these, of necessity, healthy spaciousness and ordered amenities.”

Mr. Burnham too could sound that high note, but he was skilled also in presenting the practical advantage of a city plan. “Beauty,” he told the citizens of Chicago, “has always paid better than any other commodity and always will.” He went to antiquity for a conclusive demonstration:

“Athens was a commercial city which, four hundred years before Christ, controlled the commerce of the world, but the time came when she saw that her supremacy was about to slip away. Pericles, her ruler, perceived this and determined that though men might seek wealth in other lands, they should come to Athens to spend it: and he gathered up all the funds of the colonies, and with them superbly adorned his city. . . . He determined that the city should prosper in the future even more than it had in the past, and by making Athens fair to gaze upon and delightful to live in, he accomplished the purpose he had in view. In short, a commercial city is the one of all others that should be interested in putting on a becoming dress and assuming a charming appearance. Pericles was a political genius who knew how to perpetuate the prosperity of a city.”

Neither Athens nor Rome was made beautiful in a day. Mr. Burnham was patient of obstacles; he knew that education alone could awaken the kind of civic consciousness he sought. He had a strong man’s optimism. Therefore, he said beautifully:

“Make no little plans; they have no magic to stir men’s blood and probably themselves will not be realized. Make big plans; aim high in hope and work, remembering that a noble, logical diagram once recorded will never die, but long after we are gone will be a living thing, asserting itself with ever-growing insistency. Remember that our sons and grandsons are going to do things that would stagger us. Let your watchword be order and your beacon beauty.”

This, Mr. Moore justly writes, “has become the motto of city planners.” It is the answer of the spirit to those who feel discouraged when great city plans suffer temporary setback.

Mr. Burnham studied the character of a city and strove not merely to express but to elevate it. He saw widely and interpreted nobly. It is significant that he studied Chicago from the roof of the Railway Exchange Building, and San Francisco from the top of Twin Peaks. But the ivory tower was not for him. His outlook was from a workshop upon a world of realities. “It is not to be expected,” he said, “that a plan devised while as yet few civic problems have received final solution will be perfect in all its details.” These words were spoken of Chicago, but they apply with at least equal force to San Francisco.

Many of San Francisco’s civic problems were far from final solution when Mr. Burnham conceived his plan for the improvement and adornment of the city. That plan, as wrought out in detail by Mr. Edward H. Bennett, had just come from the printing press when the disaster of 1906 overwhelmed San Francisco. The Burnham Plan suffered a temporary setback. Yet the Burnham influence could not be entirely disregarded. In the words of Mr. James D. Phelan, president of the Association for the Improvement and Adornment of San Francisco (carefully considered words in a letter to Mr. Moore):
"As a result of his educational influence and the Plan, we now have a beautiful civic centre, inferior in site to the one he laid out, but only two blocks removed from it. I believe that the existence of this fine civic centre, as it is today, flanked by city hall, auditorium, and library, is due to him, as is also the parkway connecting Golden Gate Park and the Presidio. As the time goes on, his various suggestions, as embodied in the Plan, will, I believe, be adopted."

And Mr. Willis Polk, who was associated with Mr. Burnham in the making of the San Francisco Plan and of whom Mr. Moore writes that he "has never ceased to press upon the attention of the people of San Francisco the permanent character of the Burnham Plan, and the value of its component parts," supplements Senator Phelan's statement as follows:

"Perhaps few of us realize that this plan was essentially a plan for the future. Nearly all of us have been too limited in our imaginations to visualize its potentialities. San Francisco seems to have done nothing, yet in effect it has done much."

Considering how much Chicago has accomplished along the lines of its Burnham Plan, the results thus far in San Francisco may seem disheartening, but to take a pessimistic view of the outlook is to disregard the most important lessons Burnham endeavored to teach. The Burnham Plan for San Francisco is not a little plan. It has magic to stir men's blood. It is noble, it is logical; it will not die. Its execution will eventually add another glory to the name of the master city planner "whose influence," as Mr. Moore says in the concluding sentence of this biography, "was so fine and so strong that to those who knew him his presence continues and will continue to be felt."

* * *

I Am the Architect

PATTERNING after the Omnipotent Architect, I create, striving always for the beautiful through greatest utility.

I serve the world as the thinker whose thoughts precede the need, and bring into likeness the means of fulfilling that need.

My mind has conceived the housing of man and beast—of the wheels of industry—of the machines of production.

My visions transferred to lasting form guide the men of the earth in selecting shelter for life, love and work, the three greatest blessings.

The arts and the sciences are my masters and my tools. I appeal to them and I use them to produce greater comfort and greater happiness for mankind.

From the turrets of the east to the pillars of the west, I draw material ideas to form the basis of my conception, striving always to be rewarded by the execution of the fittest.

I hope, pray and labor to do better and greater things in the daily doing of my duty, that the structures—children of my ingenuity—may live and bespeak my sincerity.

My creed is growth and development—evolution of the ultimate in satisfaction.

I build up—

I am the Architect.

HOWARD LAW,

By permission of Chas. B. Johnson & Son.
Joint Convention of Idaho Architects and Engineers

The first joint convention of the Idaho Society of Architects, the Idaho Chapter, A. A. of E., and the Idaho Irrigation Congress was held at Rupert, Idaho, January 16 to 21, with an attendance of nearly 100 members of the three organizations. A splendid program was arranged, with discussions on such interesting subjects as "The Relation and Need of Co-operation Between the Architect and Engineer," by Mr. W. L. Skidmore of Pocatello; "Architectural Practice, Office Management, Specifications and Quantity Survey," by Mr. Burton E. Morse of Twin Falls; "Relation of the A. I. A. to State Societies," by Mr. Leslie S. Hodgson, president of Utah Chapter, A. I. A.; "Practice and Fees," by Mr. Fred F. Wilson, secretary of the Montana Society of Architects, Bozeman, Mont.; and "City Planning, Objects and Why," by Mr. I. L. Wright, secretary of the Idaho Society of Architects, Idaho Falls.

Mr. H. Newton Thornton of Idaho Falls, president of the Idaho Society of Architects, delivered the opening remarks, reviewing briefly some of the more important achievements of the society since its inception in 1915. The society was primarily responsible for securing adoption of the Architects' Registration Law, and is now working indefatigably to obtain legislative indorsement of a State Building Code for Idaho. The old board of officers of the society was re-elected as follows: President, H. Newton Thornton, A. I. A., Idaho Falls; first vice-president, F. C. Hummell, Boise; second vice-president, Frank H. Paradice, Jr. A.I.A., Pocatello; secretary and treasurer, I. L. Wright, Idaho Falls; directors, F. L. McGrew of Idaho Falls, C. F. Hummell of Boise, Marcus Grundfor of Pocatello, Burton E. Morse, A.I.A., of Twin Falls.

The following extracts are taken from Mr. Thornton's address on "A State Building Code for Idaho."

It is a serious reflection on the architects of the State of Idaho, and the whole country for that matter, that so many of the building codes of the smaller cities appear to be heirlooms from the past ages when reinforced concrete construction was undreamed of, and many of our modern methods of construction and sanitation were not yet developed. Various restrictions appear to be relics from the past and merely serve to remind us of an unenlightened age or of our remarkable evolution in matters of building. All this should be remedied, but on account of the cost of printing and the time involved in bringing the laws up to modern standards, we still work for the most part by an antiquated city building code, that should long ago have been consigned to the scrap heap. This has served in a large measure to breed contempt in the minds of builders and architects for building codes in general.

In addition to this, there has been no adequate inspection of the buildings erected. In most cases there is no building inspector at all, and in many cases where there is one he is not qualified for the position or the remuneration for his services is purely nominal and he cannot afford the time to carefully examine all buildings to see that they are in accordance with approved plans. This again has resulted in contempt for the city building code.

In the early stages of the growth of our western country the pioneers were so glad to see any kind of a building go up that they cared little for restrictions. The word restriction would never have appealed to them, for they were anxious to encourage the erection of any kind of a structure that seemed to give prominence to their communities and provide work for its citizens. A code placing restrictions on building was not looked upon with favor, and so gradually a free for all, so as you please policy was adopted that soon began to make trouble as the settlement grew into a town.

The evolution of our towns shows many instances of this condition and we gradually get accustomed to the unsightly eyesores which are a menace to our safety.

*Editor's Note: Mr. Thornton’s views are timely because of the recent collapse of the Knickerbocker Theatre in Washington, declared to have been due to faulty design and incompetent inspection. Steel construction intended to support the roof was weak in certain points and below the requirements of the plans submitted, according to Mr. Robert Henry Davis, engineer in the District of Columbia, who was employed to investigate the cause of the accident.
and health and we even sometimes begin to regard them as familiar landmarks. However, the smaller towns of this western country have improved so much over the pioneering conditions of the past, that if it were not for the prohibitive cost, many of the older structures would be condemned and razed to the ground to make way for more efficient, more sanitary and more congenial buildings.

The buildings of a community have their advertising value and represent the thought and progressiveness of its architects, builders and citizens in that community. A well written building code pays large dividends to the city or state that adopts it: it is of inestimable value to the fire departments, it helps progress and respect for law and order, and is often the direct means of saving many lives. It is of course necessary in order to get the full benefit from any building code that a sufficient inspection is made of the buildings erected to insure that they conform to the approved plans.

The Idaho Society of Architects has long realized its responsibility in the matter of better building codes and has made an effort towards the establishment of a State Building Code, but has not yet been able to get any bill before the Legislature. At a recent annual meeting a standard building code was approved, but unfortunately the time was too limited to successfully carry the project to a conclusion, even though it received hearty support from leading state authorities.

To my mind we would have better chances of success if we tried the adoption of a simplified code, even if it did not contain all the provisions we desire, as a long complicated technical document appears to raise so many legal aspects that it involves long delays in consideration. Since our effort to establish a standard code many other states have succeeded in providing a building code carrying with same administrative officers for its enforcement or providing that buildings be erected after plans prepared by registered architects, where public safety and health are concerned. The latter provision being to safeguard the building public against those who in their ignorance seek to erect buildings for public use, without the services of persons qualified by law.

There is little wonder that so much poor and unsafe construction work is built when we consider the present architects' law, which permits any person or persons to prepare plans and erect buildings therefrom, provided they do not use the title of architect or engineer, and in all cases of disaster that happens to buildings the professions usually suffer condemnation in the public mind.

Of course, the mad scramble for dollars in investment is one of the chief reasons of failure and the slow progress made towards proper regulation, rather than a real or imagined lack of ability to pay for a code and the subsequent expense of enforcement.

The present conditions, especially in the western territory, are very largely responsible for the several menaces we have with us today, even inside the architectural profession, such as the type of architect who from a lack of desire to use modern methods and revised formulae and with a total disregard for anything new in building materials increases to an unnecessary extent the cost of construction. This results in contractors and other taking advantage of their opportunity and proving their ability to build for less money by eliminating architectural control and supervision.

A little knowledge in the building industry is more dangerous than in any other line of business when one is permitted to exercise it without regulation. Look at the class of work, in the most cases, of builders who obtained their knowledge of building through the mill of limited experience only, with no technical training or regard for accepted formulae, and in many cases without any educational base whatsoever. This class of builder, who blindly treads where angels would fear, brings about much of the bungles and abortions in the construction industry.

It is not surprising under such circumstances that the architectural profession is slow to gain the confidence of the building public, especially where these conditions just mentioned exist. This indeed makes it hard to sell our services or educate the public that their interests are best conserved, their safety and health best guarded by regulation and the employment of expert service.

Then again the public are always made acquainted through the press or otherwise, of failures, insanitary conditions, fire hazards and collapse of construction work, and the causes are usually laid at the doors of the profession in the public mind. We know in most cases, it not all, that these conditions can be traced to the unqualified and inexperienced builder, the greedy investor, or the lack of regulation and municipal supervision.

I do not want to be an alarmist, as the condition is not so discouraging as all that. However, we ought to at least recognize it, and brush the cobwebs from our own methods, and take advantage of new ideas, new materials and formulae as other professions do. Perhaps post graduate courses in our educational institutions and
societies, similar to the medical profession, would tend to keep us abreast of the
times and be the means of much progress.

True public service is the responsibility of the profession and when this service is
rendered it is one of the chief means of convincing the man on the street the value
of architectural standards.

The financial loss to the profession through lack of regulation is another phase.
I have seen as many as you have, in the survey of existing buildings executed with-
out architectural control, inharmonious distribution of money to the extent that an
architect’s fee for the entire project has been absorbed in some single piece of con-
struction, such as foundation walls, structural steel and absurd ornamentation and
millinery effects.

Who has not had the feeling of irritation many times on reading the construction
requirements of many of our city building codes. Take, for example, floor loads
which vary from 40 lbs. per sq. ft. to 100 lbs. per sq. ft. for office buildings. Kidder
emphasized this matter, and not many years ago made an investigation of actual loads
in this class of buildings, and concluded that nearly all codes not only differed
materially but were unnecessarily severe. The majority of architects if not hampered
with code requirements consider 50 lbs. per sq. ft. ample.

Look at floor loads for dwellings in our present codes varying from 25 to 60
lbs. per sq. ft., and the actual conditions observed in thousands of occupied rooms
seem to warrant no more than 30 lbs. per sq. ft. for upper floors and say 40 lbs. per
sq. ft. for ground floors.

The live load for an apartment house in Milwaukee is 30 lbs. per sq. ft., while in
Buffalo the requirements are 70 lbs. per sq. ft. more than twice. Surely it is an easy
matter to arrive at safe live-load requirements for various buildings and standardize
them to the end that such inconsistencies as this are eliminated.

An examination of floor load requirements in our present codes for all classes of
buildings shows similar wide variations from loads manifestly too light to loads
much too heavy and absurdly heavy in most cases.

In some cities 8” brick walls are permitted in certain classes of buildings, while in
other cities only 12” is allowed. One of our leading magazines records some facts
that are interesting in this regard. A building was recently erected in one of our
cities where the walls had to be 12” thick, and the same plans were used in another
city where the walls could be thinner. The steel work for the second building was
redesigned and a saving in steel amounted to more than 260 tons. Floor loads and
wind requirements were the same in both places.

What about speculative building? The recent collapse of a theater building in
Brooklyn with its lamentable loss of life and serious injury of many workmen engaged
in its construction was traced to speculative building interests.

This is another menace to the building industry, and always has been. Every
effort is made by those engaged in this kind of business to avoid recognition of
existing building codes, due partly to their severity and, of course, their desire to
yield unreasonable profits on an investment.

Speculative building is one of the prime factors in our disasters, and should be
governed by every precaution, regulation and municipal inspection. Think what
might have happened if the Brooklyn theater had been completed and had fallen
on an audience of hundreds of people. There should be no excuse or economy that
would permit the use of poor and doubtful materials, and the recognition of our
present codes, no matter how severe, especially for buildings designed for public
assembly.

Then too there is the recent collapse of a grain elevator of no small proportions
in one of our local cities, and the collapse of an amusement hall that nearly bordered
on a calamity, due to faulty roof construction, and many others could be cited. There
is an unusual evidence of altogether too much latitude in this section, in the design
and construction of floors and roofs, with little or no margin of safety for poor
materials, unscrupulous contractors and other unusual conditions.

We are entirely to blame when we continue to permit such condition to exist,
in face of our knowledge of these things, without making criminal complaint against
those who continue to violate common accepted standards. We ought to rid our
garments of such blunders, and in case any of us should be guilty of negligence in
our own work and methods, we should suffer the same consequences.

So, much for the structural part of our service. A few words might now be
indulged in with regard to plumbing and sanitation of buildings, which of a necessity
is involved in a building code, and by no means the least important.

The sanitary requirements of buildings have received more attention by our
authorities than the structural requirements, with little or no enforcement of either,
and the codes vary materially in different districts, retarding standardization in this
class of work. The lack of uniformity in practice and the absence of standardization
and adequate inspection has been the means of encouraging unscrupulous plumbing contractors to violate every sanitary measure that has been established.

Cleanliness is the basic principle of sanitation and plumbing work provides the means of cleansing the person and apparel and the removal of body and domestic wastes from the immediate neighborhood of buildings. But the lack of knowledge and keen competition have developed a class of materials, construction and workmanship that is unfavorable to the health in many of our communities.

Insanitary conditions are sure to result if each person or plumbing contractor is permitted to install plumbing work according to his own ideas.

Poor plumbing work contributes very largely to the detriment of the architectural and engineering professions. Low first cost in this part of a building, as in others, is a mistaken economy. A second class plumbing, heating or drainage system will provide a second class system in service. A year or so in service will usually reveal the inefficiency of the fixture, device or construction. Discomfort, inconvenience, cost of repairs, foul odors, insanitary and unhealthy conditions are the resulting penalties which the unfortunate occupant or owner must pay.

Good plumbing is as much a science as any other branch of our professional service, and it should be installed in accordance with scientific principles and natural laws. We ought as a profession to pay more attention to this part of a building than we have in the past and the fundamentals of same should be embodied in our building codes. Municipal inspection should be by technically trained men and not medical doctors or others, as is the custom now in this section of the country, where there is any inspection at all.

I cannot conclude without a word about fire prevention and fire-safe buildings. An able president of one of the largest fire insurance companies has said: "As an individual, I would be very glad to see buildings made more fire-safe, and especially theaters and buildings for public assembly, but as an underwriter I charge for the hazard as I find it, and need not care particularly whether the rate is one per cent or five per cent."

However, in the belief that fire-safe buildings and good construction should be universally recognized as of utmost importance, the National Board of Fire Underwriters, a commercial organization if you please, prepared and recommends a building code, which is sufficiently amplified for varying local conditions and we ought to make more use of it until we can establish something better ourselves.

* * *

In Favor of the Quantity Survey

SOMEWHERE about eight years ago, Mr. G. Alexander Wright, a member of the Institute in the San Francisco Chapter, besought the interest of the Journal in the subject of Quantity Surveying. He was a pioneer in an unreceptive land. And now that he is no more and, like many another, did not live to see his long devotion bear any great fruit, let it not be forgotten that he was a pioneer and that because of the interview in question the subject of Quantity Surveying was never lost to sight again, so far as the Institute was concerned. We are proud of our share in the document which has been sponsored by the Institute, the Engineering Council and the Associated General Contractors of America. It recommends the Quantity Survey to every owner, and very properly reminds him that he should not "pay a contractor an overhead charge which includes any other costs than belong to his own project," and likewise that an owner should pay for the preparation of an itemized list of quantities whether he proceeds with the contemplated project or not. Assuredly he should, and assuredly some owner does pay for them several times over, under the present system. The only man who gets anything free is the man who never builds, because all the expenses of nursing him through the preliminary approaches are saddled upon someone else. The overhead borne by the building industry, because of the supposed free service rendered, is no small item. Any man proposing to spend a considerable sum of money in building should insist on a Quantity Survey, as one of the most certain means of economy that he can employ.—Editorial in Journal of the American Institute of Architects.
BUILD NOW!

Conditions are right, and now is the time to build.

It is an undisputed fact that there is a great shortage of proper housing facilities in San Francisco and the Bay Region, due principally to the thought that, as time goes on, there will be a decrease in building costs.

There has been an earnest and sincere effort made by some of our public spirited men to reduce the prices of building materials, which, in a measure, has been successful; but during the hearings it developed that the manufacturers themselves believed that the basic prices of raw material, rail rates, fuel oil and power were also due for a drop. They were, consequently, in many cases, running only to 50 per cent capacity, in order not to have on hand big stocks manufactured at present prices.

Architects are now busy on many new projects, speculative builders are enlarging their activities, and the investor is beginning to realize that there are increasing opportunities in the realty market.

The results are even now apparent. There is an increasing demand for materials of all kinds, and as the manufacturers have not been working to full capacity and have not accumulated any stocks, prices are bound to advance.

When the full significance of these facts is realized by the public, San Francisco will probably see a repetition of the 1918 and 1919 building booms.

We are now enjoying industrial peace. While the Impartial Wage Board, which has just handed down its decision, did not make any radical reductions, yet it equalized the wages of many of our mechanics and eliminated some of the so-called "skilled" crafts, whose work is now being done by common labor at about one-half the former cost.

An estimated saving in labor costs of about 20 per cent can be traced indirectly to an increased efficiency.

CHAS. W. GOMPIERTZ.
utility, makes the movement for active planting one that deserves energetic prosecution. Trees planted along highways not only furnish beauty and shade, but have a beneficial effect in protecting the concrete or macadam surface from excessive temperature changes.

At its last meeting, the California Highway Commission received six inquiries about highway tree planting. The active prosecution of this work is being undertaken by the commission in cooperation with the State Board of Forestry and the local authorities interested.

Notes and Comments

The greatest building activity in this country this year will be in the industrial states, according to a forecast of the building outlook made by the Committee on Statistics and Standards of the Chamber of Commerce of the United States.

It is pointed out by the committee that there will be a good many business buildings erected in 1922, and a large number of them will be in the shape of alterations and enlargements. According to the committee, California leads the other states with respect to probable construction, while good likelihoods of construction lie in the Central West and in the East.

Three factors enter largely into the problem of building during the coming months: the high price of material, high price of labor and the question of obtaining funds for construction. Prices of material, on the whole, are much the more favorable of the three factors. It is only here and there that there is any apparent difficulty in this respect. The matter of too high priced labor does not figure so well as that of material, but there is a general belief that not only are matters improving in this direction, but when springtime comes the long period of probable idleness of labor will naturally tend to bring about a much more favorable solution of this problem than is now presented.

The matter of obtaining money for construction is the most difficult problem of all. It is not that money seems to be so high in price as that it is hard to get.

Apparently when construction gets well under way it will comprehend a great many dwelling houses in its purpose and intent; this because of the supreme necessity of more adequate housing almost everywhere.

There also will be a very large number of educational buildings, such as churches, schools and additions to colleges and universities. The numerous "drives" for funds set on foot by all sorts of educational institutions will bear fruit in many new buildings this spring.

Few things tend to hasten the return to better times more than the building industry. Things used in the building of dwelling houses call upon virtually all the industries of the country for their products. A general and far-reaching construction program in this country in 1922 is the best possible harbinger of a return to more prosperous conditions.

There seems to be a growing curiosity throughout the country as to just how far architects and engineers are going in regard to advertising their respective professions. The following letter, addressed to the editor, under date of January 17, 1922, from a Kansas City advertising firm, indicates this trend of inquiry:

We are interested in knowing just what has been done in the way of advertising by architects, and are taking the liberty of writing you.

We would like to know how this profession looks upon advertising at the present time, what action has been taken, or plans made along this line. Also, we would be grateful to have you refer us to any individual advertising that has been carried on by architects, or advise us of some other source of information.

(Continued on page 112.)
American Institute of Architects
(ORGANIZED 1857)
OFFICERS FOR 1920-21

President...........................Henry H. Kendall, Boston
First Vice-President..........Charles A. Favrot, New Orleans, La.
Second Vice-President.....Wm. B. Faville, San Francisco
Secretary- Treasurer,......W. Stanley Parker, Boston, Mass.
Treasurer..................D. Everett Wade, New York

San Francisco Chapter

President..........................G. A. Applegarth
Vice-President.....................Earnest A. Cohn
Secretary-Treasurer.............J. H. Fairweather
Directors.........................W. B. Faville, Wm. Moore, John Reid, Jr., S. Schnattacher, Geo. W. Kelham, Morris M. Bruce

Southern California Chapter

President.........................Sumner P. Hunt
Vice-President.....................Reginald D. Johnson
Secretary............................Charl. F. Plummer
Treasurer......................Ather W. Rea
Directors....................Edwin Bergstrom, D. C. Allison, S. B. Marston

Portland, Ore. Chapter

President......................W. C. Knighton
Vice-President..............John V. Bennet
Secretary..................F. W. Folger Johnson
Treasurer......................O. R. Bean
Trustees....................E. S. Lawrence, Joseph J. Jacobberger

Washington State Chapter

President............................Carl F. Gould
First Vice-President..........Louis Baeder
Second Vice-President Frederick Westcott
Third Vice-President......Roland Borneh
Secretary.....................H. O. Sexsmith
Treasurer.....................Carl Siebrand
Executive Committee........Charl. H. Alden

California State Board of Architecture
NORTHERN DISTRICT

President..........................Clarence R. Ward
Secretary-Treasurer...............Sylvain Schnattacher
J. R. Miller
Edward Glass
J. J. Donovan
Address all communications to the Secretary, 1039 Philan building, San Francisco.

SOUTHERN DISTRICT

President......................John Parkinson
Secretary-Treasurer.............A. M. Edelman
W. H. Wheeler
Myron Hunt
W. J. Dobo
Address all communications to the Secretary, H. W. Hellman building, Los Angeles.

San Francisco Architectural Club

President......................Wm. Watson Jr.
Vice-President...............Mark T. Iorgerson
Secretary.....................James F. McClellan
Treasurer.....................John A. Peterson
Directors....................Fred G. Munk, C. K. Schmiedt, H. E. Burnett

San Francisco Society of Architects

President.................Clarence R. Ward
Vice-President...............Herman Barth
Secretary-Treasurer..........H. H. Gutterson
Directors....................W. C. Hayes

Washington State Society of Architects

President............................R. H. Rowe, Seattle
First Vice-President........Clayton D. Wilson, Seattle
Second Vice-President Philip B. Zittel, Spokane
3d Vice-President............Watson Vernon, Aberdeen
4th Vice-President..........Richard V. Good, Omak
Secretary.....................J. R. E. Vincent
Treasurer......................L. L. Mendel, Seattle
Trustees...................H. H. James, Frank Fowler, A. Warren Gould, W. J. Jones, R. H. Rowe, all of Seattle.

American Society of Landscape Architects
Pacific Coast Chapter

President.....................W. D. Cook, Jr.
Vice-President...............Stephen Childs
Secretary-Treasurer..........E. T. Mische

Tulare Society of Architects

President.....................Roland E. Bothek
Vice-President...............Earl Dugan
Secretary and Treasurer........A. J. Russell

San Diego Architectural Association

President.....................Wm. Templeton Johnson
Vice-President...............Robert Halley, Jr.
Secretary-Treasurer..........E. C. Decker

American Society of Civil Engineers
San Francisco Association

President.....................M. M. O'Shaughnessy
1st Vice-President............W. L. Huber
2nd Vice-President..........F. R. Muhs
Secretary and Treasurer..........Nathan A. Bowers
Board of Directors........W. L. Huber, F. R. Muhs, M. M. O'Shaughnessy, E. J. Schneider, Nathan A. Bowers
Address all communications to the secretary, 502 Rialto Bldg., San Francisco.

Los Angeles Association

President.....................R. J. Reed
First Vice-President..........F. D. Howell
Second Vice-President.......W. H. Codie
Secretary............................F. G. Dessary
Address all communications to Secretary F. G. Dessary, 619-20 Central building.

American Association of Engineers

President.....................L. K. Sherman
First Vice-President..........H. O. Garman
Second Vice-President..........A. B. McDaniel
R. W. Barnes
Frederick Bass
R. A. Bertenshaw
Cincinnati
W. G. Bolin
Chicago
Raymond Burnham
Chicago
C. E. Drayer
Chicago

American Association of Engineers
San Francisco Chapter

President.....................W. H. Phelps
First Vice-President..........Geo. Mattis
Second Vice-President..........W. D. Baker
Treasurer....................F. T. Amweg
Secretary....................Capt. A. J. Capron
Permanent address, 960 Pacific Bldg.

Los Angeles Chapter

President.....................H. Z. Osborne, Jr.
First Vice-President..........H. C. Ferry
Second Vice-President..........W. D. Patch
Treasurer....................E. R. Merrick
Secretary....................Willis S. Peffer
Permanent address, 625 Metropolitan Bldg., Los Angeles.
With the Architects

Building Reports and Personal Mention of Interest to the Profession

Meyer & Johnson Busy

New work in the offices of Meyer & Johnson, Bankers’ Investment building, San Francisco, includes a five-story lodge building for the Bakersfield Elks to cost $300,000; a one-story reinforced auto sales building at 14th and Harrison streets, Oakland, for the Haynes Company to cost $30,000, and a reinforced concrete drill tower for the San Francisco Fire Department to be erected at the foot of Eleventh street to cost $40,000.

C. W. Dickey Gets New Appointment

Mr. C. W. Dickey, who has been connected with the construction department of the Oakland Board of Education as Supervising Architect for the past two years, has been appointed architect for the remaining schools to be erected under the bond issue, and he will receive six per cent of the $2,500,000 yet to be expended on new school buildings. Mr. Dickey is planning to occupy offices on the second floor of the building at Broadway and 21st street, Oakland.

University to Have Bowl

The Regents of the University of California are reported to have definitely decided to construct an earthen “bowl” in Strawberry Canyon, University campus, Berkeley, instead of the proposed steel and concrete stadium planned by Architect John Galen Howard. The proposed “bowl” will have a seating capacity of 75,000. Messrs. Baker & Carpenter, 58 Sutter street, San Francisco, are the engineers.

Claremont Residences

Plans have been prepared by Architect W. H. Ratcliff, Jr., of Berkeley for two residences in Claremont, one for Mrs. H. G. Peake to cost $17,000, and the other for Mr. Chas. L. Wooll to cost $12,000.

San Francisco Residence

Plans have been prepared and a contract has been let for a large residence in Seacliff, San Francisco, for Mrs. L. Martin. Mr. M. V. Politco with offices in the First National Bank building, San Francisco, is the architect.

Record Month for Building Permits in San Francisco

San Francisco is coming back to its own in building construction, if the records of Building Inspector John P. Horgan for the month of January are to be taken as a criterion. According to Mr. Horgan the permits for the month totaled $5,528,978, which is the largest total for any one month since 1906. Permits for 210 frame structures alone estimated to cost $1,271,402, indicate an appreciable revival of home building.

Oakland Office Building

Bids have been taken and a contract will be awarded to Mr. R. W. Littlefield, Everson building, Oakland, for the construction of an eight-story Class “A” office building at 17th and Clay streets, Oakland, for the Pacific Gas & Electric Company. The structure will cost $318,500. Mr. C. W. Dickey is the architect.

Two Bank Buildings

Architects George C. Sellon & Company of Sacramento are completing plans for a one-story monumental bank building for the Sacramento branch of the Bank of Italy.

Plans have been completed by Architect E. C. Hemmings for a reinforced concrete bank building at Placerville for the El Dorado County Bank. It will cost $40,000.

Residence and Apartments

Architect C. O. Clausen has completed plans for a $20,000 residence in St. Francis Wood for Mr. Arnold Haas and plans are being prepared by Mr. Clausen for a three-story store and apartment house to be built at 23d avenue and Geary street for Mr. Robert Smith of 600 21st avenue.

Officers of Architectural Club

The following officers were elected at the last regular meeting of the San Francisco Architectural Club: William Watson, Jr., president; Mark T. Jorgenson, vice-president; James F. M’Guinness, Jr., secretary; John A. Peterson, treasurer; Fred G. Munk, C. R. Schmidt, H. E. Burnett, directors.
Reid Bros. Busy

Architects Reid Bros., California-Pacific building, San Francisco, report having considerable work on hand, including a large four-story reinforced concrete school building at Pierce, Fell and Hayes streets for the Greek Orthodox Cathedral; a nine-story Class "A" store and office building at Post and Powell streets for Mr. William Fitzugh, and a one-story auto sales building on Pine street, near Van Ness avenue, for the Allyn estate.

Silver Cup for Home Builder

The Stockton architects have arranged for a silver cup to be given to the owner of the most attractive home, from an architectural point of view, erected each year in that city, beginning 1922. A jury of outside architects will determine the winner of the trophy. If rivalry to secure this prize can be stimulated it ought to prove advantageous to the architects of Stockton as well as to the city.

Berkeley Hospital

Architects Ashley & Evers, First National Bank building, Oakland, has prepared preliminary plans for a million dollar hospital project now being financed by the Temple Hospital Association, Inc. Mr. Richard L. Frye, president and manager. There are to be seven fireproof buildings. The association owns the property at Dwight way and Milvia street.

Pomona High School

Plans are out for figures for the Pomona High School group and bids will be opened on March 7th. Messrs. William H. Weeks and Robert H. Orr are the architects.

Another large school building-out for figures is for the San Mateo Union High School District. W. H. Weeks is the architect and the estimated cost is $300,-000.

$100,000 Church

Architect James W. Plachek of Berkeley has been commissioned to prepare plans for a $100,000 edifice for the Congregational Church at San Mateo. The design will be Spanish with terra cotta tile roof.

Shrine Hospital, San Francisco

Architects Weeks & Day are completing working drawings for the proposed hospital for children which the Shriners intend to build in San Francisco.

Granted Certificate

Mr. Geo. W. Hoover of Planada, Merced county, has been granted a certificate to practice architecture by the California State Board of Architecture.

Prior Estate Building

It is announced that the brick building at Mason and Eddy streets, originally designed by Architect Earl Scott, and which has been standing in an unfinished condition for several years, is at last to be completed. The Prior estate, owners of the property, have reached an agreement to go on with the work which, it is estimated, will cost $200,000.

Much Residence Work

Architect Earl B. Berti, 168 Sutter street, San Francisco, is preparing plans for two $20,000 residences to be built in Seac1iff for the Allen Company; also for a residence and garage on Third avenue for Mr. William Farrell, and two $8,000 dwellings in St. Francis Wood for the Garden Homes Company.

Returns From Europe

Architect Warren C. Perry has resumed the practice of architecture after several months' trip abroad. Mr. Perry is also devoting considerable time to his duties as an instructor in the Department of Architecture, University of California.

Architect Hildebrand Moves

Architect E. H. Hildebrand has moved from the Foxcroft building, San Francisco, to the French Bank building. Mr. Hildebrand has quite a little work on the boards, including an apartment house, two flats and a residence.

Concrete Loft Building

Plans are being completed by Architect George W. Kelham for an eight-story reinforced concrete loft building to be built at Fremont and Mission streets, San Francisco, for the Walton N. Moore Company. The structure is expected to cost $250,000.

Architect Will Collaborate

Architect G. A. Lansburgh of San Francisco has been chosen to collaborate with Architects John C. Austin and A. Edelman of Los Angeles in the preparation of plans for the new Shrine Temple to be erected in the Southern California city at a cost of one million dollars.

Concrete Apartment House

Architects Morrow & Garren, Chronicle building, San Francisco, have prepared plans for a four-story reinforced concrete apartment house to be built on Turk street, near Leavenworth, San Francisco, at a cost of $45,000.

State University Building

Architect W. C. Hays of San Francisco has completed plans for a two-story reinforced concrete and tile horticultural building to be erected at Davis for the University of California.
Washington Chapter A. I. A.

The Washington State Chapter, American Institute of Architects, held its annual meeting at the Washington Hotel, Seattle, January 21st. Between seventy and eighty architects from the various centers of the state were present. Following the election of officers for the ensuing year many reports were read which indicated that the chapter had been active throughout the year and material progress had been made toward a better order of things in whatever it had undertaken.

Mr. Carl F. Gould of the firm of Bebb & Gould, Seattle, was chosen president; Mr. Louis Baeder, Seattle, first vice president; Mr. Frederick Westcott, Spokane, second vice president; Mr. A. J. Russell, Tacoma, third vice president; Mr. Harold O. Sexsmith, Seattle, secretary; Mr. Carl Schenck and Mr. Leslie H. Alden, executive committee member; Mr. Harlan Thomas, Mr. F. A. Naramore and Mr. J. H. Schack, delegates to institute convention.

The twenty-seventh annual dinner of the organization was held in the evening. Mr. Charles H. Alden, retiring president of the chapter, presiding.

Critiques Stadium Plans

Regardless of costs, the building and grounds committee of the Regents of the University of California does well when it considers the plans for location and erection of the Berkeley stadium. The present plans provide for the wrong building in the wrong place. The design offended the sensibilities of a great many people to whom it suggested a Roman amphitheater, with its gladiatorial butcheries. As for the location, it appears to have been both financially and physically impossible. Reared 95 feet high in the midst of close built dwellings, the stadium would have been a disfigurement, and there would have been scant parking for automobiles.—San Francisco Journal.

Architect Reenters Private Practice

Mr. Daniel R. Huntington, who for the past twelve years has been city architect of the city of Seattle, opened offices recently at 1011 Alaska building for the practice of his profession. Mr. Huntington came to Seattle from the East in 1905 and up to 1910, when he became city architect, engaged in private practice.

Gilroy School Building

Architects Wyckoff & White of San Jose are preparing working drawings for a gymnasium and addition to the grammar school at Gilroy, Santa Clara county.
Personal

Mr. Reginald D. Johnson announces Messrs. Gordon B. Kaufman and Roland E. Coate have joined him in a partnership for the practice of architecture under the firm name of Johnson, Kaufman & Coate. Offices will be maintained at 100 E. Colorado street, Pasadena, and 607 Union Bank building, Los Angeles.

Architect F. Manson White, with offices formerly at 823-4 Chamber of Commerce building, Portland, has moved to 449-50 Sherlock building, Seattle.

Mr. Charles H. Haynes, architect of Aberdeen, Washington, has been elected to an associate membership in the Washington State Chapter, American Institute of Architects.

Mr. Orrin E. Stanley, assistant city engineer of Portland, has been elected president of the Portland Municipal Civil Service Association for the ensuing year.

Architect Earl B. Scott died February 10th of consumption. Mr. Scott was at one time associated with Mr. W. H. Crim, Jr., architect of San Francisco.

Art Students' Annual Competition

A scholarship competition open to all art students in the United States, with the exception of those in New York City, will be held at the Art Students' League of New York on March 24.

Ten scholarships will be awarded to that work showing the greatest promise. Work in any medium, from Life, the Antique, Landscape, Etching, Portrait, Illustration, Composition, also photographs of Sculpture, may be submitted. All work should be forwarded so as to reach the League, 215 West 57th street, New York, not later than March 17th, and must be sent with return express or parcel post charges prepaid.

San Jose Buildings

Architect Chas. McKenzie, San Jose, reports having made plans for a $35,000 brick commercial garage for Mr. Norman Kooser; also he has awarded a contract for a $20,000 residence for Mr. Warren Pomeroy and he is preparing plans for altering the Columbia Hospital into modern apartments at a probable outlay of $20,000. Mr. McKenzie is revising plans for an $18,000 residence on The Alameda, San Jose, for Mr. Preston Boomer. Building in San Jose had just begun to show signs of a boom when the fight for the American shop was inaugurated.

Architects and Advertising

(Concluded from page 107.)

Thanking you in advance for cooperation in this, we are.

Architects, as a rule, do not approve of newspaper or periodical advertising, other than to use a professional card or print their names beneath a cut of a building designed by them. One San Francisco firm, however, uses half a page display in an industrial magazine to tell its readers that they are experts in planning industrial buildings and factories. Another architect advertises modestly as an "authority" on school architecture. The Idaho Society of Architects has adopted twelve standard advertisements, together with an architectural design for a setting. This system of propaganda, when used, is expected to eliminate much of the adverse criticism of the past by taking the public into partnership. The purpose of the advertisements will be to impress upon the public that architectural service, properly imparted, is quite as important a factor in civilized life as the service rendered by any other profession.

Architects Move

Offices are being fitted up in the new sixteen-story building at Montgomery and Pine streets, San Francisco, for Architects Weeks and Day, who will move from the Phelan building.

Mr. Geo. A. Lansingh will move from the Guenther building, at Third and Mission streets, to the new Dunn-Williams building, at Montgomery and Bush streets, as soon as the structure is completed.

Architect Geo. E. McCrea has moved from Capitol to 318-19 Exchange building, San Francisco.

Architect Fred W. Quandt has moved from 984 Ashbury street to 616 Monadnock building, and Architect Paul de Martini has vacated his old offices at 2123 Powell street for larger quarters at 946 Broadway, San Francisco.

Architects Elect Officers

The Washington State Society of Architects held its annual meeting at Seattle in December, the out of town guests being Messrs. Watson Vernon of Aberdeen and Julius Zittel of Spokane. Mr. R. H. Rowe, Seattle, was elected president and Mr. R. E. Vincent, Seattle, secretary. After the banquet and election of officers, the evening was given over to social enjoyment.
With the Engineers

Reports from the Various Pacific Coast Societies, Personal Mention, Etc.

Engineers Too Timid and Too Modest

Mr. George R. Fansett, engineer with the Bureau of Mines, Arizona, and also on the staff of the University of Arizona, met with the officers and committeemen of the Los Angeles Chapter, American Association of Engineers, recently to discuss engineers and their problems.

Mr. Fansett, in summing up the accomplishments of the various professional men, stated that while the engineer has unquestionably done more for civilization than any other professional man, and if what the public of today believe that he were to be wiped from the earth, humanity would be right back in the dark ages, yet he receives less appreciation and recognition from the public than either the doctor or the lawyer. This is the fault of no one but the engineer, himself, his inherent timidity and modesty keeping him from seeking the publicity to which his accomplishments entitle him.

No one can say that the engineer, who voluntarily renounces the comforts of civilization, immuring himself it may be for years at a time in a torrid jungle or an arid desert in order that humanity may benefit, is a physical coward. Yet Mr. Fansett believes that the engineer, in refusing to enter public life in an endeavor to correct some of the glaring faults of administration, when such exist, is a mental coward. The engineer has the one most important asset for entering into public life—he has the confidence of the public that he is honest. He attributes the failure of the engineering profession to reach its highest plane of advancement to the absolute unresponsiveness of the engineer as a citizen, his aloofness in all matters outside of his own profession.

Mr. Fansett stated there are three problems to solve with regard to the engineer. First, to solve the engineer, himself—eliminate cheapness, cut-throat tactics, penuriousness. Second, to educate the public to appreciate what the engineer has accomplished in material lines, to realize his value to humanity. Third, a thorough revision of the curriculum of engineering colleges. He gave it as his opinion that among the professors who are in charge of training prospective engineers, in many of our colleges there is much dead timber which must be cut out, if the student is to receive full value for the time he is spending in obtaining an engineering education.

—Southwest Contractor and Builder.

Engineers Wanted

The most vital need of the woodworking industry is a group of trained woodworking engineers, similar to those experts who have accomplished the wonders so apparent in the fields of mechanical, electrical, and civil engineering. It is true that we have a few engineers in the woodworking industry, but those engaged by manufacturers of furniture can be counted on the fingers of the hands. Some of these are university graduates of mechanical engineering, who largely through circumstances have entered the furniture field and applied their good training to its problems. Others are college men with a few years of experience gained in the Forest Products Laboratory, or a similar institution. Still others are factory trained men, with or without much schooling, but men of such ability that they have been able to grasp the problems as they came up and to solve them in a really scientific manner. Their reputation has spread, so that they are now acknowledged to be the production experts of the industry. The big problem of the woodworking engineer is the elimination of waste. Waste tends to maintain production cost at a high level in normal as well as in abnormal times.

What would the steel and iron manufacturers, who waste practically nothing, think of an industry which wastes close to 600,000,000 feet of hardwood every year?

The fact is known that to cut 1,200,000-000 feet of dimension stock—the annual requirement of hardwood—that it takes 1,800,000 board feet of lumber to do it, leaving, as sheer waste, 600,000,000 feet of lumber.

Six hundred million feet of lumber at an average cost of $40 per M gives an annual waste of $24,000,000,000. Every manufacturer using dimension lumber contributes his share toward this immense sum, and every consumer of hardwood products eventually pays the bill.

And this item is not alone when one figures waste in the woodworking industry. What about the freight on the six hundred million feet that eventually goes under the boiler? What about the shrinkage in kiln drying, dry rot, checking, warping, honeycombing, etc.?

Labor wastes are so well known that it is useless to enumerate them. There is hardly a factory worker today whose efficiency runs much over 60 per cent. as
compared with many of the other industries where mechanical engineers have attacked the problem of mechanical aids to human labor, and thus greatly increased the output per man.

Many factories in which furniture is being manufactured are run today on practically the same basis on which they were run fifty years ago. The average manufacturer is still more interested in the marketing of his product than he is in his manufacturing process. Sensible it would be if he would forget about his sales force long enough to give his production a bit of serious attention and how sensible it would be if he were to endeavor to interest our engineering schools in this problem.

We feel that this is a large enough problem for serious discussion in the press. We believe that the associations of furniture manufacturers are now realizing this. We know that if the associations were to get back of this thing and push it with vigor, it would bring forth good results—good, not only for the woodworking industries—but for the great American public as well. Let our motto always be, "A trained engineer in every furniture factory."—The Furniture Manufacturer.

Clipping Filing System for the Engineer

It is generally recognized that a collection of clippings from technical and other magazines and papers is of great value if the clippings are filed in such a manner as to be readily accessible. A useful method for handling such clippings is described by Mr. S. L. Sinclair, Engineer, Minidopa Irrigation Project, in the July Reclamation Record.

The method requires the use of a standard filing cabinet, with 6 by 9 in. drawers.

A page from a standard technical or similar magazine usually measures 9 by 12 in. If trimmed and folded once will fit a 6 by 9 in. drawer. A full-size index card is used for each subject and when a clipping covers more than one subject and does not permit separation, in some cases the subject matter of each being on opposite sides of the clipping, a separate card is filed to cover one of the articles on the clipping. The data on the card covers the subject matter of the clipping and shows under what subject the actual clipping is filed.

For example, a clipping with reference to "Testing water wheels after installation," has on the reverse side an article relative to "Standard colors for power station piping." The clipping is filed under Water Wheels and a separate card is filed under Piping System. On this card is written: Standard colors for power station piping; filed under Water Wheels; see Testing after installation. In the case of small clippings they are pasted on 6 by 9 in. cards, which are filed in the usual manner.

A cross index is used when necessary to list or index a single clipping requiring more than one key word or title.

In a six-drawer file Mr. Sinclair now has approximately 600 index cards with subject matter. The last twenty and odd cards are indexed as follows:

Water, water hammer, water measurement, water motors, water power, water proofing, water treatment, water wheel, weighing machinery, weights and measures, wheels, windmills, wire prices (this is on a blue card), wiring, wiring diagrams, wiring prices (this is on a blue card), wiring rules, wiring tables, wood working, vehicle equipment, zinc.

In some cases a large amount of data may be filed under a single card.

Innumerable valuable articles are read and forgotten which, if filed, would be of great value for future reference. In such cases it is generally impractical to retain the entire magazine or paper on account of the large accumulation that would result, and if retained it is of little value owing generally to lack of an index.

Removable Car Roof

A removable roof for freight cars so that lumber may be loaded in packages by locomotive crane is one of the waste prevention devices to which the National Lumber Manufacturers Association has been devoting some attention during the past two years.

So far it has been unsuccessful in interesting manufacturers of freight cars in this innovation to the extent of active cooperation although a number of them have been addressed on the subject. Some of the carbuilding requirements now in force would have to be modified somewhat to permit of such a roof, but this is not thought impossible by car manufacturers and the removable roof is considered an entirely feasible device. The plan is now in abeyance but has not been abandoned.—The National Lumber Bulletin.

The Cost of Expert Engineering

A joint committee of the City Council and Civic Commercial Association of Bakersfield has decided to recommend the rejection of the Olmsted report on a municipal water system. This report estimates the cost of a system to supply the needs for a population of 50,000 at $1,500,000. One of the reasons given for rejecting the report is that its adoption would involve the payment of an engineering fee on the total cost of the system, including the purchase price of the existing water plants in Bakersfield. This fee is approximately 4 3/4 per cent, or a total of $69,000. For expert engineering of a project of this kind the fee asked is not exorbitant, although it may appear to the layman to be very large.
NO. 2 OF A SERIES OF

STANLEY
SPECIFICATIONS ON

BALL
BEARING
BUTTS

DATA:
The lasting high finish is obtained by giving the polished cold rolled steel a heavy copperplate, with an additional heavy plate of the finish required.
Equipped with Stanley non-detachable, weather-protected, ball-bearing washers in each joint. The ball tip has a square shoulder, fitting flush with the knuckle. The tip and pin are made in one piece. The loose pin has the Stanley non-rising and self-lubricating features. The inner edges of the leaves are beveled to make a closely fitted joint. The corners are square, and the edges of the leaves are ground clean and true.
The class number (252) is stamped upon the back of the butt, at the top of the leaf and near the joint.
Stanley Sherardized finish (designated by the letter "Z") stamped on the leaf near the joint) is recommended for exterior use and can be furnished in any plated finish desired.
We showed specifications on BB239 in the January issue of this publication. Will gladly forward it if you wish to keep this series complete.

The STANLEY WORKS
NEW BRITAIN, CONN.

Manufacturers of
Wrought Hardware and Carpenters' Tools

BB252 (⅛ size)
6 x 6 on 2½"
door of wood

BB252 is made in the following sizes and in all finishes.

<table>
<thead>
<tr>
<th>Sizes</th>
<th>6 x 4</th>
<th>6 x 5</th>
<th>6 x 6</th>
<th>6 x 7</th>
</tr>
</thead>
<tbody>
<tr>
<td>8 x 4</td>
<td>6 x 8</td>
<td>7 x 6</td>
<td>7 x 7</td>
<td>7 x 8</td>
</tr>
<tr>
<td>10 x 8</td>
<td>8 x 6</td>
<td>8 x 8</td>
<td>8 x 10</td>
<td></td>
</tr>
</tbody>
</table>
A DEFINITE assurance that construction recovery is under way and that it is the first phase of a general business revival sums up the results of the construction conference held in Cleveland January 17 to 19 by the Associated General Contractors of America. Evidence of this fact, both statistical and informal, abounded in the discussion of the delegates and in the papers presented as a part of the program.

Col. Leonard P. Ayres, who was chief statistical officer of the A. E. F. and who is now vice-president of the Cleveland Trust Company, expressed the belief that prices will continue to fall, intermittently, for ten or twenty years more, but conveyed assurance that the construction industry will be immune to many of the embarrassments of the coming period, because it supplies a market in which there is a latent demand equal to 2¾ years' normal production of building.

"In other words," said Col. Ayres, "construction can go along for nine years at 25 per cent above normal and only fill the normal demand by the end of that time."

Col. Ayres said that building finance problems had commenced to adjust themselves, through greater abundance of money. "The acrimonious discussions between yourselves as contractors and ourselves as bankers are about over," he remarked. "Within six months so much money will be available for borrowers that owners will be able to arrange building loans on pre-war terms."

Charts shown by Col. Ayres indicated a subnormal volume of building for every year since 1912. Even the apparent large building figures for 1919 and 1920 were only apparent, he declared. The cost was large but the building was far behind even the current needs of the time. The only time in the last nine years when the volume has gone above average requirements was for the last few weeks of October, 1921. This was chiefly residence building, but it shows in Col. Ayres' opinion that the tide is rising rapidly. He declared that building prosperity is always the first phase of general revivals and that it disseminates prosperity more widely than any other type of activity.

Determined not merely to predict prosperity, but actually to observe it, the constructors arranged a program in which the theme of waste elimination was constantly emphasized.

Mr. J. Park Channing of Boston, who succeeded Herbert Hoover as chairman of the Federated Engineering Organizations, gave the major paper of the conference on this subject and said that 25 per cent of the responsibility for waste rests on labor, 50 per cent on management and the remaining 25 per cent on outside relationships. In respect to industrial accidents, however, he asserted that 85 per cent of the responsibility rests on the individual workman.

Constantly changing personnel is a case of waste treated by the speaker and he recommended measures to increase the period of active work so that employment will be more nearly an annual affair. He expressed faith in the method of reasoning with employees rather than ordering them, when labor emergencies are encountered. Material control was treated as a major timesaving proposition in the building business.

Mr. F. L. Cranford of New York, former government director of the Muscle Shoals nitrate plant, discussed a 20,000-mile trip taken by officers of the association in the interest of construction revival. He expressed the opinion that labor has reached pre-war efficiency and that the chief retarding factor is the general belief that material is too high, "particularly materials controlled by national associations that meet behind closed doors."

Cost-plus contracts, fee contracts and efforts made in some projects to eliminate the general contractor were discussed. Mr. D. A. Garber of New York voiced the belief that few architects and engineers can qualify to direct a building project in the place of the general contractor. Mr. Godfrey Edwards of Los Angeles decried anything but lump sum contracts, believing that when a builder takes a job on a cost plus or a fee basis
We specialize in

Stair Work

C. I. and W. I. Stairs
Spiral Stairs
Counter-balanced Stairs
Theatre Fire Escapes, etc.

Michel & Pfeffer
Iron Works

Phone
Market 730

Specify and Use

Schroeder
Direct-Flush Valves
for your Toilet Installations

Suitable for any type of building
Adaptable to any style toilet fixture

SOME OF THE TALKING POINTS THAT COUNT:
No rubber or leather parts to wear out Adjustable to suit the pressure
No noise or hammer No corrosion—no leaks
Nothing to get out of order Saves repairs and waste of water

Send for latest circular "B" showing different types of installation

MANUFACTURED BY
STANDARD METALS MANUFACTURING CO.
Main Office and Factory: 1300-1302 No. Main St., LOS ANGELES
San Francisco Office: 16 Steuart Street

AGENCIES: San Diego Portland Seattle Salt Lake City Denver Phoenix

"The Schroeder's Correct—Its Flush Is Direct"

When writing to Advertisers please mention this magazine.
he is paving the way for his own elimination.

The conference acted favorably on the Kenyon bill, to create a reserve fund that will stimulate construction in depressed periods.

Mr. Otto T. Mallery, from the Department of Commerce, urged that 10 per cent of all public construction funds be set aside in such a reserve, each normal appropriation for that year.

Other speakers at the convention were Mr. Ernest T. Trigg, of Philadelphia, president of the International Federation of Construction Industries, whose subject was "Co-operation in Construction," and Col. Evan Shelby, New York attorney, who was formerly legal advisor to the construction division of the army, who spoke on "Organization in Construction."

"The opportunity before the construction industry is very great," Mr. Trigg said, "if and when the public's confidence is secured.

"We have passed the stage when the employers and the employees can get together with themselves and with each other and determine the affairs of the third party, the public. The public has come back into its power.

"But until we come to where the public confidence is restored, construction is not going to revive."

"The obligation rests with the leaders in the construction industry to clean house," Mr. Twigg emphasized. They must, he said, see that the customs of the trade which hold up costs and neutralize the effects of competition, be done away with. They must also, he said, take the initiative in promoting more cordial and economical relations with their workmen.

"You must not take advantage of the fact that now you have the whip hand," Mr. Twigg asserted. "By taking the broad view of things right now, you will bring about a condition of peace in industry where both you and your employees will share in ungrudged prosperity."

Col. Shelby outlined the steps by which the general contractors were organized for the first time during the war, an organization which preceded the one just closing its convention, and pointed to the accomplishments of its short existence as forecasting the progress which will be realized by simplifying the forms of contract, promoting research in industrial methods and improving the relations of the contractors with the material dealers and workers.

Mr. Arthur S. Bent of Los Angeles was unanimously elected president, and he made a splendid appeal for "Idealism in Construction," saying in part:

The industry that we represent is not alone very great; it was the only hope of a shattered world rising almost in ruins only yesterday. Men may fight and destroy for a time, they can build forever, and the very continuity of life itself depends upon construction.

In thinking of our A. G. C. I have wondered if sometimes you thought that I was too much of an idealist. It is a profound truth that no institution can continue to exist without genuine moral worth. If that is true, then the measure of our work will be our success or failure to be a true and lasting giant.

As a matter of fact, the A. G. C. should ever stand for being served rather than serving, for having rather than being, for getting rather than giving, with a purpose to achieve any success that will be worth our time and effort.

But there is not and never has been the spirit of this organization, and please God it never will be! Victor Hugo tells us that the world lets everything die that is moved by selfishness, and the reason the A. G. C. is a lasting giant tonight is because it is inspired with a spirit of unselfish co-operation between ourselves, and the reason the public will stand with us is that it is a purpose to lift our craft to higher levels of integrity and honor.

There is a very beautiful legend, an impressive one, I think, so old that its origin is lost— I have never been able to discover it. It goes like this: Men stood weeping before God open He made the world, and watched with wonder as the shimmering sphere flung from the fingers of Omnipoetical the place where you stand is a galaxy of stars, and one of the men said, "How was it done?" And God said to him, "Go, find out for yourself." And that man went and became a scientist.

And the second man said, "What is it for?" And to him God said, "Go, find out for yourself." And he went out and became a philosopher.

"Give it to me," the third begged. And to him God said, "Go, possess it for yourself." And he went out and became the business man.

The fourth said nothing, but fell down and worshipped, and God said to him, "You, too, shall go and touch your soul burns within you shall create beauty," and that man went and became the artist.

Now, we are not, reverently and not unfttingly, to add to this noble group of God's journeymen the constructor? We who for ever and always have are the others in We who have straightened and the path for their feet? We, without whom their high destinies could not be wrought out and by whom all their visions are crystallized? We work and delve for science in its onward march, and harness its magic to ways of usefulness.

The preserving and marvelous structure through which business functions is the work of our hands. Philosophy leans upon us heavily to demonstrate the insidious theories of life, but we give its tools and make its dreams of beauty imperishable.

We are hands through which nearly all of human thought and all of material progress are expressed. Through our highways and railroads and educational and heating and lighting of schools and homes we touch all life intimately and come very close indeed to the heart of humanity, and with that vital and varied contact comes to us an impressive but inspiring responsibility. It is given to us, if we see it rightly, to raise the standard of every man's service by the fidelity of our own.

I make no apology for such idealism in an organization like this because wherever our industry is today is the sum total of the thoughts that all the constructors in the world have about it, and the future will rise above that level, and as that level advances to higher planes of integrity and service, we shall travel further and further away from that stigma of sordidness which has bedeviled our history and on which it is given to the A. G. C. to carry that bright banner in the very vanguard.

Of course, national achievement is not statistical. We can't measure our progress along those lines. Nevertheless, I firmly believe, and you do too, that it will have our real, our real, most profitable progress, and the span of our activities is not limited to our own present interests.

We are anxious to make connection with a finer thing for those who will come after us. We are consciously sowing seeds which will be harvested by those who never knew us. Is there any finer thing in life than that?
THE success of the stucco house is influenced as much by the permanence as by the beauty of its surface.

Atlas White is a true Portland Cement varying in no way from Atlas Gray Portland Cement except that it is a pure white. In using Atlas White, the architect secures an absolute permanence to whatever texture he chooses. Architects can obtain detailed information about the various types of stucco finish on request. The Technical Department of this company welcomes every opportunity to aid in securing better building practice.

For over a quarter century Atlas Portland Cement has been deservedly known as "the Standard by which all other makes are measured."

The reproduction shows a finish obtained by throwing a rough coat on and smoothing the high parts with a steel trowel. The strength of Atlas White Portland Cement, properly applied, insures the permanence of this pleasing effect.

THE ATLAS PORTLAND CEMENT COMPANY
NEW YORK — BIRMINGHAM
CHICAGO
Boston Philadelphia St. Louis
Dayton Des Moines

When writing to Advertisers please mention this magazine.
Overhead in Construction Work *
By M. J. REINHARDT, M. A. C. E.

In considering "Construction Overhead," the writer has seen fit to take two divisions of the overhead cost, which expense is so frequently overlooked in estimates, but which necessarily and surely enters into the cost of all construction work.

These two divisions are: First, the general overhead expense or that which is necessary for the maintaining of a construction organization to carry on such business; and second, the contingent overhead expense or that which is brought about by the above organization performing some specific construction operation or contract job. The first will naturally vary with the size of the organization or firm and with the scope of the construction field covered by it; the second will remain about the same for a given work, whether the firm employed is large or small, and is contingent in amount upon the work performed.

General overhead which is very small for certain small contract workers, runs into considerable proportions for firms organized to handle proficiently large undertakings.

Thus, two mechanics may contract to plaster a house at so much per yard for the labor, or to lay brick by the thousand, performing practically all the work themselves. While they may have to spend certain of their time in getting such work, so does the mechanic working by the day or by the hour, and, it may well be said, the general overhead expense for such individuals is practically nothing.

Gradually these same men, working as a firm, are called upon to contract for the larger work and to compete where materials have to be purchased by them and where it is necessary for them to employ labor. They soon find the need of a bookkeeper, an office or place of business, and files and office equipment. Finally, a corps of estimators and detailers become necessary and they must have construction equipment and invested capital. As the firm expands and covers larger territory, branch offices are required in the locality where the work is being done, which means more clerical work at home, more analyzing of costs and more detail work in order to promptly purchase material on a larger scale and carry on their operations successfully. Each expense is what the writer has termed general overhead and it includes such items as salaries and traveling expenses of men devoting their time to general supervision and to getting contracts, salaries of estimators and detailers and clerical help, office rent, insurance, interest paid out, taxes, reports and advertising, general depletion and obsolescence of equipment on hand, wire service, office supplies, etc. Should the above total thirty thousand dollars expense per year for a firm doing one million dollars' worth of business per year, this general overhead would amount to 3 per cent, of the gross income; and, since the firm's source of revenue is obtained from compensation paid to it for performing construction work, it must necessarily be paid this item of 3 per cent. general overhead on every item of expense, in order to realize just compensation for the work performed.

In considering the second division or contingent overhead, this can best be analyzed by considering the items of expense which enter into a specific operation, for instance, a cubic yard of concrete in place in an average highway bridge, such as is frequently awarded on a unit bid proposal by the engineer in charge. These items are:

<table>
<thead>
<tr>
<th>No.</th>
<th>ITEM</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Portland cement, 1 1/2 bbls. @ $2.80... $4.20</td>
</tr>
<tr>
<td>2</td>
<td>Drayage on 6 sacks @ 4c each... $0.24</td>
</tr>
<tr>
<td>3</td>
<td>Return of 6 empty sacks (and loss). . . $0.05</td>
</tr>
<tr>
<td>4</td>
<td>Crushed stone .84 yds. @ $3.00... 3.24</td>
</tr>
<tr>
<td>5</td>
<td>Drayage on stone .84 yds. @ $1.00... 0.84</td>
</tr>
<tr>
<td>6</td>
<td>Sand .42 yds. @ $2.50... 1.05</td>
</tr>
<tr>
<td>7</td>
<td>Drayage on sand .42 yds. @ $1.00... 0.42</td>
</tr>
<tr>
<td>8</td>
<td>Waifs and breakage... 0.05</td>
</tr>
<tr>
<td>9</td>
<td>Form lumber 100 ft. B. M. @ $35.00... 3.50</td>
</tr>
<tr>
<td>10</td>
<td>Carpenter labor on forms, 100 ft. B. M. @ $3.00... 3.00</td>
</tr>
<tr>
<td>11</td>
<td>Hardware (nails, wire, etc.)... $0.68</td>
</tr>
<tr>
<td>12</td>
<td>Fuel, oil, etc... 0.68</td>
</tr>
<tr>
<td>13</td>
<td>Labor for mixing and placing... 3.00</td>
</tr>
</tbody>
</table>

Material and labor cost... $19.30

14 Freight on equipment... 3.40
15 Plant set up... 0.50
16 Rental on equipment... 0.20
17 Liability insurance... 0.25
18 Bond premium, 1 1/2% of total cost... 3.36

Contingent overhead... $1.71
19 General overhead 3% of total cost... 0.72

Contractor's cost... $21.73
20 Contractor's compensation 10% of contractor's cost... 2.17

21 Total... $23.90

The first thirteen items represent the cost of labor and material in the common usage of the terms, while the next five items, fourteen to eighteen inclusive, are those items which the writer has termed contingent overhead. In this instance they are charges for getting machinery and equipment to the place where the work is to be done, placing the equipment in position to do the work, the wear and tear and maintenance on equipment, the liability insurance which is the employer's insurance against the responsibility imposed upon him by law to take care of injured employees or the injured public, and last the bond premium which most construction operators carry to protect the owner against loss or default on the part of the contractor.

*Paper presented before the Oklahoma Chapter of the American Association of Engineers at annual convention, Oklahoma City, Okla., October 27, 1921, and reprinted from the Contractor's Bulletin.
What could be more delightful than the simple and effective pattern work here rendered by means of the always adaptable brick units? The patterned tympana over the windows, the basket weave door jambs, the soldier and rowlock belt courses, and the field of Flemish Bond unite in a chaste mosaic of which the eye never tires.

Example of Artistic Brickwork

The illustration above represents one of the plates in our Portfolio of Architectural Details in Brickwork. The collection at present embraces thirty-two de luxe half-tone plates of the finest type of brickwork, assembled in an enclosed folder, with printed tab, ready for filing.

These examples cover a wide range of interior and exterior subjects, and will be useful in the drafting room for suggesting many interesting methods of treating the wall surface. This portfolio will be added to from time to time with further examples, with data on brick and its uses, and with monographs on the treatment of the mortar joint in connection with the blending of the brick color tones. A set of these plates in the folder will be sent to any architect requesting them on his office stationery, and his name will be placed on the list for future mailings.
These are all items of expense which enter into the cost of the operation or work, and cost about the same whether the construction firm be large or small so long as it has the facilities and ability to perform the work in the regular way; and while they are items of expense entirely apart from labor and material actually put into the structure, they may best be termed contingent overhead expense.

Such contingent overhead expense may be very limited or almost negligible under some local or ideal conditions and may be so heavy in some exceptional cases as to exceed the cost of all other items combined, such as that encountered in contracting to furnish and drive a bent or two of piling in an isolated location penetrating a difficult material, or contracting to surface the floor of a bridge with hot asphalt in an isolated location. In either case it is readily seen that the transportation of equipment, together with that of a few necessary skilled mechanics, might easily double in total cost the average units cost for such work. Therefore contingent overhead should be estimated for each particular operation.

Assuming that the above cost analysis of the yard of concrete in place is a fair average condition, the expense of what is commonly termed labor and material is $19.30. The contingent overhead is $1.71, the general overhead 72c. These latter two items combined amount to $2.43 or about 10 per cent. of the total cost and thus exceed in amount the fair allowance of contractor's profit or compensation based upon 10 per cent. of the contractor's cost.

While society is gradually shaping our affairs to increase the general overhead by requiring better equipped and more talented organizations in order to produce better structures, increasing taxes on capital invested and incomes, increasing contingent overhead by the introduction of workmen's compensation laws, requiring surety bonds, etc.; is the engineering profession giving due consideration to this item of cost "construction overhead?" Those of us who are devoting our energies mainly to construction work or general contracting often realize its overwhelming power too late, still following the old school methods of preparing estimates, which were in vogue when overhead was a very small factor in costs.

In conclusion, the endeavor has been to leave this one thought with you; that overhead costs are necessary and essential in our present day methods of carrying on construction work, and should be given the same consideration and looked upon in the same light as other legitimate costs entering into the grand total of expense for doing the work.

---

**How Much Building Is Needed?**

What is the amount of construction necessary to bring the building situation back to normal? A survey has been completed by Building Age, showing the requirements of cities over 25,000 inhabitants and those under 25,000. The following table shows the number of buildings which, if erected immediately, would meet present needs:

### CITIES OVER 25,000 POPULATION

<table>
<thead>
<tr>
<th>Buildings</th>
<th>Total Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Houses: 319,528 needed</td>
<td>$2,625,501,000</td>
</tr>
<tr>
<td>Apartment Houses: 2,582 needed</td>
<td>64,291,000</td>
</tr>
<tr>
<td>Schools: 475 needed</td>
<td>74,191,000</td>
</tr>
<tr>
<td>Office Buildings: 300 needed</td>
<td>52,851,000</td>
</tr>
<tr>
<td>Miscellaneous Buildings, such as hospitals, hotels, garages, factories, etc.: 629 needed</td>
<td>71,867,692</td>
</tr>
</tbody>
</table>

Total expenditures to relieve present shortage: $2,289,007,092

### CITIES UNDER 25,000 POPULATION

<table>
<thead>
<tr>
<th>Buildings</th>
<th>Total Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Houses: 852,905 needed</td>
<td>$8,352,585,500</td>
</tr>
<tr>
<td>Apartment Houses: 15,937 needed</td>
<td>644,975,000</td>
</tr>
<tr>
<td>Schools: 4,917 needed</td>
<td>698,314,000</td>
</tr>
<tr>
<td>Office Buildings: 4,412 needed</td>
<td>480,908,000</td>
</tr>
<tr>
<td>Miscellaneous Buildings, such as hospitals, hotels, garages, factories etc.: 12,645 needed</td>
<td>619,889,000</td>
</tr>
</tbody>
</table>

Total expenditures to relieve present shortage: $5,795,987,340

Questionnaires were sent to Chambers of Commerce throughout the country, asking what construction was necessary in their particular towns. Twelve per cent of the cities reported no buildings were required. In these cases some special condition was cited as a cause, such as excess construction to meet war needs.

### Labor Cost in Building Six Room House

The following are preliminary figures, furnished by the Department of Commerce, Washington, D. C., showing the percentage which the amount paid to each labor group bears to the total labor cost of six room house:

<table>
<thead>
<tr>
<th>Trade</th>
<th>Frame House</th>
<th>Brick House</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carpenters</td>
<td>49.6</td>
<td>32.2</td>
</tr>
<tr>
<td>Bricklayers</td>
<td>6.2</td>
<td>21.5</td>
</tr>
<tr>
<td>Hod carriers</td>
<td>2.2</td>
<td>6.7</td>
</tr>
<tr>
<td>Plasterers</td>
<td>7.9</td>
<td>8.8</td>
</tr>
<tr>
<td>Plumbers</td>
<td>8.7</td>
<td>7.6</td>
</tr>
<tr>
<td>Electricians</td>
<td>2.0</td>
<td>2.5</td>
</tr>
<tr>
<td>Painters</td>
<td>10.0</td>
<td>6.5</td>
</tr>
<tr>
<td>Common laborers</td>
<td>6.3</td>
<td>9.9</td>
</tr>
<tr>
<td>All others</td>
<td>6.5</td>
<td>4.5</td>
</tr>
</tbody>
</table>

Total | 100.0 | 100.0

These averages were constructed from reports covering a large number of six room brick and frame houses throughout the country.

The relation of the amount paid to the various groups to the total labor cost varies according to the types of construction prevailing in the various localities: however, these averages give a fair view of the general distribution of labor costs.
There Was a Man Named Lincoln

So that we shall remember the kind of man he was, the Lincoln Memorial stands in Washington. So that our children's children may never forget how much this America is his—grown, developed, and glorified—this monument will endure for generations.

Simple, strong, essentially true (as truth is expressed in architecture), it typifies the man whose memory it perpetuates. Among the materials chosen for this lasting memorial were 17,000 pounds of ARMCO Ingot Iron to frame the skylights. By holding off the rust that destroys, this iron will add its share to the many years that the memorial will say to the world, "There was a man named Lincoln."

THE AMERICAN ROLLING MILL CO., Middletown, Ohio

An ample supply of Armco stock is carried in the San Francisco warehouse, Tenth and Bryant Streets. Other branch offices in New York, Pittsburg, Cleveland, Detroit, St. Louis, Cincinnati, Atlanta, Washington and Buffalo.
Notable Decline in Building Costs

The impression persists in the minds of many people who would like to become home owners, that building costs are still abnormally high, and that in order to build economically they must wait.

The Engineering News Record has recently published an index of construction costs which is given in the table, for the years 1920 and 1921. The index number represents the cost of construction for those years, as compared with the cost in 1913, the figure 100 being taken as the index for the year 1913.

From this table it will be clear that the peak of construction costs was reached in June 1920, with an index number of 273, as compared with 100 in 1913; while in November, 1921, its cost had dropped to 166.

<table>
<thead>
<tr>
<th>Year</th>
<th>Construction Cost Index Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>1913</td>
<td>100.0</td>
</tr>
<tr>
<td>1920</td>
<td>273.20</td>
</tr>
<tr>
<td>1921</td>
<td>166.32</td>
</tr>
</tbody>
</table>

Wash in the Fountain

Something new in lavatory fixtures has been introduced. It is a device called a washfountain, and wherever it has been installed has proven entirely satisfactory.

The fountain may be used wherever large wash-rooms are necessary; in factories, schools, public buildings, hotels and railway stations—in fact every public or industrial lavatory.

Considerable economy is effected in the amount of water consumed. The washfountain built to accommodate twelve people, for instance, uses no more water than the amount piped for one washbowl. This is accomplished by converting the flow into a fine stream—just as effective. Hot water costs are also reduced, since the water may be heated at any desired temperature, evenly.

The fountains are manufactured in two sizes—a fifty-four-inch basin to accommodate twelve people, or a smaller, thirty-two inch, where six people may wash at one time. Due to the circular construction of the fountain there is plenty of "elbow room" for the comfort of the users.

---

Book Reviews

Edited by August G. Headman, Architect


Selected from the work of Kenneth W. Dalzell, architect, this book, published and arranged and edited by Edward F. Hammel, architect, is a collection of attractive well studied designs with plans of logical homes for the average American family. All illustrations are of exceptionally clear quality, well arranged and printed on heavy paper of unusual stock.

The preamble and other text should prove of special interest to the layman and architectural profession inasmuch as it states very clearly the understanding that should exist between client and architect. An understanding which all architects feel is seldom evident in their client and a quality which is absolutely necessary in order to produce a successful conception and solution of all problems involved in the complete solution of any structure.


This treatise is a simplified presentation of the application of geometry for the practical men engaged in architecture and civil engineering, also the student and all others engaged or interested in building construction.

The contents of the book throughout are written with a view of solving many of the usual common problems that occur in actual workshop practice.

The work should prove a valuable textbook for the use of students in technical and other trade schools.

PROBLEMS IN ARCHITECTURAL DRAWINGS—By Bush-Bruno Publishing Co., Milwaukee, Wis.

This book contains an elaborate set of plates of related architectural drawing problems in a form which will enable the student to clearly visualize the problems presented. The set comprises two series of plates and should be of especial value for the use of the instructor or student in "checking up" or correcting the student's drawings. The plates shown include framing details, basement plan, first and second floor plans, wall section, porch cornice, door and window details, front elevation, etc.

Architect to Build Home

Mr. William H. Weeks, well-known San Francisco school architect, is preparing plans for a home for himself to be built in Piedmont. It will cost in the neighborhood of $20,000.
Passing of Mr. Bryson

Mr. Hugh W. Bryson, contractor and builder of Los Angeles, died recently at the Shoreham hotel, Washington, D. C., of heart disease. He was preparing to return to Los Angeles when stricken. Mr. F. E. Engstrum, brother of Mrs. Bryson, who resides in Washington, took charge of the body and funeral services were held there, followed by cremation. Mr. Bryson built the Rampart and the Bryson apartments in Los Angeles. He was born at Memphis, Tenn., in 1868, and came to Los Angeles twenty years ago. He was for many years identified with the F. O. Engstrum Company.

Zoning Long Beach

A zoning system for the city of Long Beach is being drafted under the direction of Mr. Charles H. Cheney, city planning expert. The work was started in the Belmont Heights district where requests for restrictions in uses and types of buildings have been made. Neighborhood meetings will be held to insure creation of zones satisfactory to the people. Linked with the zoning scheme are the municipal park project, harbor development and relocation of the municipal auditorium. Acquisition of Beach frontage will be undertaken as a separate project.

Designing Big Hotel

Editor The Architect and Engineer,
San Francisco, California:
I wish to call your attention to an article on page 111 of your December, 1921, issue, in which you quote that the R. F. Felchlin Company are architects of the proposed Sun Maid Hotel of Fresno.
This should read: "The R. F. Felchlin Company and H. Rafael Lake, associated architects and managers of construction."
Mr. Lake is a local architect in San Francisco. Yours truly,
R. E. SHAW
The R. F. Felchlin Company.

Not Always Easy But it Always Pays
— to apologize
— to admit error
— to take advice
— to forgive and forget
— to begin over
— to keep on trying
— to be considerate when the other fellow isn't
— to be unselfish
— to be charitable
— to shoulder a deserved blame
— to think and then act
— to profit by mistakes

Lonesome Without The Architect and Engineer

Editor The Architect and Engineer,
San Francisco, California:
I am enclosing a check for three ($3.00) dollars for one year's subscription to your magazine ($2.50) and fifty cents additional for the one copy of the November, 1921, issue, the one dealing with the houses at Pebble Beach and Del Monte. I hope that you have an extra copy of this splendid number. Kindly start the subscription with the January issue of 1922.
I do not know if you remember me. I was in Mr. Ratcliff's office in Berkeley for some time. I miss seeing your publication as it is the only one dealing with purely Western work and news in architectural circles. I trust the new year will be a successful one for you and the magazine.
Very truly yours,
HATHAWAY LOVELL.
10 Blake Road, Brookline, Mass.

Roofers in Cut-Throat Competition

Editor The Architect and Engineer,
San Francisco:
We understand from the roofers that while the figure of $7 per square on a 5-ply felt and gravel roof for less than 30 squares and $6.50 per square for 30 squares or over is what they would like to get, they are taking jobs somewhat cheaper; in fact, we understand that they are taking them so cheaply that none of them are making any money. In other words, it seems to be a case of cutthroat competition on the felt and gravel roof and in consequence everyone suffers.
DEALER.

Opens Los Angeles Office

The Dorite Manufacturing Co. of New York and San Francisco has opened a Los Angeles office at 600 Metropolitan building. The company is engaged in the mining of magnesite, having deposits in Sonoma county, and manufacture of stucco, flooring and table tops. Its products have been in use about 10 years, the company having operated largely here-tofore in Northern California. Recently it has extended its field to New York state and the Hawaiian Islands. Mr. E. Hall Faile, well known New York architect, is the head of the company.

Los Angeles Building for January

During January, 1922, the Los Angeles city building department issued 3416 permits for structures with an estimated valuation of $7,975,168. This is a gain in valuation of 141 per cent as compared with January, 1921, when 1871 permits with an estimated valuation of $3,301,714, were issued.
The Ball Means Strength, Economy

The Reliance Ball Bearing principle permits of the most compact, rigid and simple construction. It provides the greatest strength to the exclusion of cumbersome and trouble-making parts.

The action is direct: The balls are not accessory to other rotating parts but themselves support the door and provide easy action irrespective of its weight.

RELIANCE Ball Bearing ELEVATOR Door Hangers

Reliance simplicity means quicker and cheaper installation. This saving permits the use of "Reliance" at an ultimate cost approximating that of the cheaper device.

RELIANCE-GRA nt ELEVATOR EQUIPMENT CORP'N
Park Ave. and 40th St., New York

PACIFIC COAST AGENTS
San Francisco and Los Angeles, Cal.
Columbia Wire & Iron Works, Portland, Ore.
D. E. Fryer & Co. .............. Seattle,
Spokane, Tacoma, Wash.; Great Falls, Mont.

Testing and Inspection of Building Materials

By R. R. Deans
General Manager, Canadian Inspection and Testing Co., Toronto.

The testing and inspection of building materials is to some extent looked upon by not a few architects and engineers as a novelty. Others place it in the same category as fire insurance and in some respects this classification is correct. We insure our valuable properties against loss by fire and the builder should insure his most valuable building materials against loss by failure. The engineer should guard his reputation through possible loss through failures, as such an instance, from whatever cause, attaches itself to the name of the engineer whether he is in any way responsible or not. The only time fire insurance is appreciated is after a fire; similarly the time when the services of an inspection company are appreciated is after a failure.

The necessity for testing Portland cement before using it is recognized by the most up-to-date engineers and architects. It may be argued that if the cement be obtained from a firm enjoying a good reputation there is no need for tests. This is only partly true, as the best cement manufacturers make mistakes. Your protection is the individual test by a reputable firm of inspection and testing engineers. Faulty concrete cannot be taken apart, pulverized and analyzed with a view to ascertaining that it was the cement that was at fault. The cement must be tested before it is mixed with the other ingredients.

In connection with sand, some engineers may be able to say, from visual examination, whether or not a sand is carrying a high percentage of silt, but it is impossible to say what percentage of organic matter is present in the sand. The only proper method of accepting or rejecting a sand is by the laboratory test. Many concrete failures have been attributed to faulty sand. It may be said that the sand proposed has already been used in other structures with no ill effects. However, all sands from the same pit are not equal in quality. Careless handling of the over burden and failure to remove the clay pockets are two of the frequent causes of trouble. Sand is the second material in importance used in concrete, and no contractor or engineer or architect can afford to overlook the possibilities of trouble from that source. Many of the concrete failures that occur are attributed to improper sand.

Compression tests of standard cubes or cylinders of concrete taken from the forms immediately after pouring is a first aid protection, as you obtain the actual compression strength of the concrete as it stands in the work. Good cement, good
Specify bare copper wire in your Electrical Specifications?
Of course not.

Our specifications call for good rubber insulated wire that will give protection against fire and accident. And, as further safeguard, protective metal conduits are provided for them.

But, how about the most vital part of your Electrical Installations?
The point of Control—The Switchboard, or Switch?
There is where the greatest danger lurks, and there is where maximum Safety and Protection is necessary. It is the point of necessary contact by the operator and where flashes and arcing occur in the control of the electrical circuits.

Unit Safety Switchboards and Switches
are specially designed to give maximum protection. Their steel clad fire-proof design embody besides the pre-requisite elements of safety, structural features of merit worthy of the investigation of particular Architects and Engineers. — They are neat, compact and efficient, and are built in designs to meet all requirements.

"UNIT" is to the switchboard and switch what rubber insulation and conduit are to the copper wire. Both eliminate accident and fire hazards and reduce insurance cost. Worthy investments.

Our specialized engineering service is at your disposal.

UNIT ELECTRIC COMPANY
450-460 NATOMA ST. SAN FRANCISCO, CAL.
You've seen this Switchboard

probably without its exciting any unusual curiosity, appended to the wall of an apartment house, hotel, theatre or public building.

You should learn more about this D. F. Push Button Panel Board for it means efficiency and economy and a satisfied client.

This is the first of a series of advertisements which will appear in this magazine telling pictorially the story of SECO Panel Boards and Switches.

Next month will show the Board as it appears with the center door only open, giving access to the push button compartment.

Safety Electric Company
Samuel H. Taylor, Proprietor
SECO
59 Columbia Square
San Francisco

sand and good stone may be made into poor concrete by faulty handling. The compression test is, therefore, the acid test of concrete.

When we think of the important uses to which concrete is put, as for instance, foundations, floors, etc., we cannot fail to see the necessity of knowing the character of its most important ingredients and there is no doubt, whatever, that there are many instances of failure of concrete that have occurred which might have been prevented by a judicious testing of the materials before use. After a failure is the wrong time to commence to find the cause.—The Contract Record.

Bowser & Company Announce a Piston-Type “Visible” Gasoline Pump

Of five-gallon capacity, this new pump is based on the time-proven principle of piston-type measurement and incorporates the famous Bowser water separating filter which extracts all moisture from the gasoline discharged. It also has several new features for the protection of the public.

A bell announces the completion of each gallon measurement of the piston stroke. Thus the customer can check the measurement without watching the pump.

To prevent any misunderstanding between seller and buyer as to the amount discharged, large dial indicators record each individual sale.

But the most interesting feature of this pump to the customer is a sight glass located in the discharge arm, which permits him to see the gasoline both before and during discharge. Seeing the gasoline through this sight glass before discharge, the purchaser is absolutely assured of accurate measurement. Seeing the gasoline flow through the sight glass into the hose leading to his car, he is again assured that he is getting all of the gasoline discharged by the pump.

This pump is power operated by air pressure on an auxiliary cylinder which makes the power application absolutely safe in connection with gasoline. It is also arranged for hand operation. All driving parts run in oil, assuring long life and easy operation.

While this new pump adheres to the piston-type measuring principle, for which Bowser & Company have always stood, it affords every virtue of “visibility,” with no sacrifice of safety, either to buyer or seller, in the handling of gasoline.

These pumps are now on sale in all parts of the United States.
Oakland's newest, up-to-the-minute sky-scraper will be equipped with

X-Ray Indirect Lighting Fixtures

The Ideal Illumination

Pacific Gas and Electric Building, Oakland
C. W. Dickey, Architect
Romaine Myers, Illuminating Engineer

Electric Appliance Company

DISTRIBUTORS
807-809 Mission Street
SAN FRANCISCO

When writing to Advertisers please mention this magazine.
Says Material Has Come Down

A news dispatch from Boise, Idaho, announces that "building can be done cheaper now than at any time since the war." Mr. W. W. Baum of the Baum Construction Company of Salt Lake is the authority quoted.

The prospects for building in Salt Lake are not particularly good, Mr. Baum said, owing to lack of capital for commercial purposes and the fact that many of the manufacturing concerns are not very busy.

The wage scale at present, according to Mr. Baum, is about 40 per cent higher than pre-war prices for expert labor, and 50 per cent higher for common labor. During the war common labor advanced about 100 per cent, he said, and expert labor about 80 per cent.

New Plumbing Firm

The firm of James & Drucker, plumbing and heating contractors, 450 Hayes street, San Francisco, has dissolved partnership, Mr. James retiring. Mr. Herman Lawson has become associated with Mr. Drucker and the business will be continued under the name of Lawson & Drucker at the old address.

To Relocate Yosemite Road

The $12,000,000 project of the Merced Irrigation District, approved by the state bond commission, involves the relocation of the Yosemite Valley Railroad at an estimated cost of $2,043,000. Portions of the present route of the railroad will be inundated by the building of the proposed dam in the Merced river at Exchequer.

Sutter Street Buildings

Messrs. Proctor & Chamberlain are to build two store and loft buildings on Sutter street, San Francisco, one near Stockton and the other at the corner of Mason street. O'Brien Bros. are the architects.
A faucet that will deliver hot, mixed or cold water ::

Installed in the kitchen sink, this popular Quaker fixture supplants the customary two separate faucets

*It lightens work and saves time*

**Haines, Jones & Cadbury Co.**
Makers of Plumbing Supplies
857-859 Folsom Street, San Francisco
Philadelphia-New York-Richmond, Va.-Savannah
Jacksonville-Charlotte

When writing to Advertisers please mention this magazine.
The Dunham Return Heating System is particularly adapted for buildings where no exhaust steam is available. It is designed to operate on low pressure, and is effective on a pressure of ounces.

The ability of this Dunham system to operate with any pressure up to ten pounds, is made possible by the Dunham Return Trap, in conjunction with the Dunham Radiator Trap and other Dunham Specialties.
Prices have been reduced more than reduction in material and labor costs of Wilson products—consistent with our policy of forty-five years in giving each Wilson customer the highest quality and service.

Wilson Rolling Steel Doors effect economy in building. Super-strong, durable, fire-proof. Easy to install and operate. Overhead and out of way when not in use, saving valuable floor and wall space. Used in industrial plants, mercantile houses, freight and railroad car sheds the country over.

Strength, as well as fine appearance, gained by Wilson design of Slat construction. Shields protect edges of both sides of door. Safety anchors permanently secure door in groove, offering maximum pressure resistance for minimum groove depth.

Wilson Rolling Wood Doors used wherever metal rolling doors are not applicable—especially in round houses and chemical plants.

Write for circulars. Wilson details and specifications also in Sweet’s Catalogue.

WILSON
Standard for Forty-five Years
Rolling Steel Doors

"Underwriters’ Label Service"

The J. G. Wilson Corporation
Pacific Coast Office and Factory
621 North Broadway,
Los Angeles, Calif.

Waterhouse-Wilcox Co., San Francisco
Theo. F. Snyder, San Diego
S. W. R. Dally, Seattle
F. W. Farrington & Co., Portland
Walter Dubree, Phoenix
Hawley-Richardson-Williams Co., Salt Lake City

Liquid Carbonic Bldg., Atlanta, Ga., showing Wilson Rolling Wood Doors. J. J. Novy, Chicago, Architect
Thomas Day Co.
Lighting Fixtures
SAN FRANCISCO
725 MISSION STREET
Douglas 1573
LOS ANGELES, 209-10 BROCKMAN BLDG.

Sash Chain

Cable Chain
SASH chains made of our "Giant Metal," "Red Metal" and Steel have earned a reputation for their strength, durability, and wearing qualities during their 40 years on the market. They will be found in most of the prominent buildings of the country.

CABLE chains made of Copper and Steel are especially adapted for use on elevator, fire or any large doors where a heavy weight is used.

We also manufacture Transom, Jack, Plumber's, Safety, Basin, Bath and Tray Chains, and will be pleased to furnish further information. See page 943, Sweet's Catalog.

The Smith & Egge Mfg. Co.
"Originators of Sash Chain"
Bridgeport, Conn.

Sash Chain

ROBERTS
MFG. CO.
Lighting Fixtures
Electric Appliances
Incandescent Lamps

WILLYS FARM LIGHTING
AND POWER PLANTS

663 Mission St., San Francisco

When writing to Advertisers please mention this magazine.
Detail of Interior, First National Bank of San Francisco, showing marble wainscot, check desk, seat, balustrade and candelabrum

All Marble Work by American Marble and Mosaic Company

Other contracts which we now have on hand include the

Standard Oil Building, San Francisco
Metropolitan Life Ins. Bldg., San Francisco
Union Bank & Trust Co., Los Angeles
Security Trust & Savings Bank, Los Angeles

Forest Lawn Mausoleum, Los Angeles
Bank of Modesto, Modesto, California
Seattle National Bank, Seattle, Washington
U. S. National Bank, Portland

American Marble and Mosaic Company

25-59 Columbia Square, San Francisco Telephone Market 5510
Factory on Water Front, South San Francisco Phone South San Francisco 161

When writing to Advertisers please mention this magazine.

CALIFORNIA GRANITE COMPANY
STONE CONTRACTORS

Phone Sutter 2646
Builders' Exchange, San Francisco
Main Office, Rocklin, Placer Co., Cal.
Quarries, Rocklin and Porterville
Telephone Main 82

LAWTON & VEZEY
CONTRACTORS AND BUILDERS
332 CALL BUILDING
SAN FRANCISCO
306 PLAZA BUILDING
OAKLAND

CHAS. STOCKHOLM & SONS
GENERAL CONTRACTORS
849 MONADNOCK BUILDING
Phone DOUGLAS 4557
SAN FRANCISCO

HOT WATER ELECTRICALLY
ALL YOU WANT
ALL THE TIME
THERM-ELECT WATER HEATER for APARTMENT HOUSES,
RESIDENCES, ETC.

ELECTRIC SALES SERVICE COMPANY
2532 Sixth Street, BERKELEY
Phone Berkeley 3070

JOHN M. BARTLETT
GENERAL CONTRACTOR
Office
357 - 12th ST., OAKLAND
Phone Lakeside 6750
Res. Phone Berkeley 6884 W

LARSEN-SIEGRIST CO., Inc.
BUILDING CONSTRUCTION
807 Claus Spreckels Building
SAN FRANCISCO

Shop and Compare—that's the only true test
of values.
Furnishings for the home of distinctive style are
featured in this shop at prices that will bear the
strictest comparison.
Furniture Draperies Floor Coverings Interior Decorations

Motors Lighting Fixtures Construction
Bought, Sold, Rented, Repaired Manufactured Maintenance Supplies
SPOTT ELECTRICAL CO.
16th and Clay Streets Oakland, California
The Charm of Color Tones
and the harmonious beauty of
CLAY TILE ROOFING

make for that super-elegance in which the exterior adornment of the home finds its highest expression. An element of charm is added by the broad variation of color tones in wondrous harmonizing effects and soft texture.

Manufactured by
Los Angeles Pressed Brick Co.
FROST BUILDING, LOS ANGELES

UNITED MATERIALS COMPANY
Distributors for Northern California
SHARON BUILDING, SAN FRANCISCO
The Latest
Country-house
Color-schemes

An especially appropriate and harmonious exterior color-treatment has been developed for the dignified and beautiful type of country-house that our leading architects have now firmly established, in place of the fifty-seven varieties that have prevailed in recent years.

Cabot's Old Virginia White, for the walls
Cabot's Creosote Stains, in greens or dark gray, for the roofs

The soft, brilliant "whitewash white" of the Old Virginia White is particularly suitable for this type of house, and the rich greens and velvety dark gray stains harmonize perfectly for the roof, with the old New England dark green blinds.

Samples and information sent on request

Cabot's Creosote Stains, Waterproof Cement, and Brick Stain
"Quilt" Conservo Wood Preservative, Damp-Proofing
Protective Paints, Waterproofing, etc.

Pacific Materials Co., San Francisco
Waterhouse-Wilcox Co., Los Angeles
Theo. F. Snyder, San Diego, Cal.

Building Apartment Houses

The records show a noticeable increase in the number of apartment houses for which contracts have been let this past month.

There is a tremendous demand for buildings of this type, strengthened by a return to normal prices. Conserve space by specifying

Portal Wall Beds
MARSHALL & STEARNS CO.
WALL BEDS
Highest Award Always

1152 PHELAN BLDG., SAN FRANCISCO
1774 BROADWAY, OAKLAND

When writing to Advertisers please mention this magazine.
WE MAKE THE FOLLOWING:


GOLD, SILVER, NICKEL, COPPER AND BRASS PLATING

We are at all times pleased to correspond with parties interested in our products.

We will be pleased to quote prices on any designs which are submitted to us.

AMERICAN ART METAL WORKS
13 GRACE ST. PHONE MKT 1404 SAN FRANCISCO

When writing to Advertisers please mention this magazine.
THE TORMEY CO.

General Painters

Phone Franklin 5-5-9-8
1042 Larkin St., San Francisco, Cal.

Alvaline, Cementoline and other
Jones-Duncan Products

MAGNER BROTHERS PAINT MAKERS

Telephone: Market 113
414-424 Ninth St. San Francisco

HEATING-PLUMBING

COMPLETE PLUMBING AND HEATING SYSTEMS INSTALLED IN ALL CLASSES OF BUILDINGS ALSO POWER PLANTS

GILLEY-SCHMID CO., Inc.
198 Otis Street, San Francisco.
Tel. Market 965

"BLAZING" THE TRAIL
We've been doing it for many years—giving the Sportsman Better Value for Quality than he ever before received. "Value at a Fair Price" in everything for the Sportsman.

Send for Catalog
The Sign of Quality

Phone Douglas 3224

Hunter & Hudson
ENGINEERS
703 Rialto Bldg., San Francisco, Cal.

BEAVER BLACKBOARD
BEAVER GREENBOARD
SCHOOL FURNITURE
AND SUPPLIES—
OFFICE, BANK AND COURTHOUSE FURNITURE—THEATRE AND AUDITORIUM SEATING
Rucker-Fuller Desk Co.
677 Mission St., San Francisco, Cal.
434 Higgins Bldg., Los Angeles, Cal.
432 - 14th Street — Oakland, Cal.

Pittsburg
It Insures Instant Hot Water Service

PITTSBURG WATER HEATER COMPANY
478 Sutter St., San Francisco
Phone Sutter 5025

RUSSWIN
BUILDERS' HARDWARE
JOOST BROS., Inc.
SAN FRANCISCO AGENTS.
We Carry Complete Stock:
Fishing Tackle—Guns—Mechanics' Tools—
Paints—Crockery and Glassware—Stoves—
Household Goods. Telephone Market 891.
NO BRANCH STORE
Mazda Lamps Electric Goods

When writing to Advertisers please mention this magazine.
GOODS OF QUALITY

A new syphon action closet at a moderate price that is not only ultra-efficient but pleasing in appearance and combining many new sanitary features.

On display at our show room—

64 Sutter Street, San Francisco
Main office and warehouse: Sixth, Townsend & Blucombe Sts.

Holbrook, Merrill & Stetson
A. D. COLLMAN

COLLMAN AND SPEIDEL

GENERAL CONTRACTING

Telephone SUTTER 4858

P. F. SPEIDEL

CONSTRUCTION ENGINEERS

MONADNOCK BUILDING, SAN FRANCISCO

I. R. KISSEL

Decorator, Painter and Paperhanger

1747 SACRAMENTO ST., Bet. Polk St. and Van Ness Ave., SAN FRANCISCO

ROBERT TROST

General Building Contractor

PHONE MISSION 2209

We Specialize in High Grade Work and Employ Skilled Labor in every Branch of the Building Industry.

26th and Howard Streets

SAN FRANCISCO

P. A. PALMER

Contracting Engineer

782-796 Monadnock Building

SAN FRANCISCO, CAL.

LOUIS FONTANELLA, Phone Mission 8925

MARK TEZA, Phone Valencia 1623

FONTANELLA & TEZA

General Contractors

Telephone West 1285

1682 Eddy Street, San Francisco

MONSON BROS.

Building Construction

Yard

Mariposa and Bryant Streets

Phone Market 2693

251 Kearny Street, San Francisco

Phone Douglas 6619

UNIT CONSTRUCTION COMPANY

(INCORPORATED)

ENGINEERING AND CONSTRUCTION

Telephone Kearny 28

429-36 Phelan Building, SAN FRANCISCO

J. D. HANNAH

Contractor and Builder

OFFICE: 142 Sansome Street

San Francisco, Cal.

Telephone Douglas 3895

BUILDERS EXCHANGE, 180 JESSIE STREET
for long-time Valve Service

MOST any valve will work well when new, but it takes a high grade product to stand up for a long period of years and to continue to give one hundred per cent efficient service. That’s why architects and engineers should safeguard the future interests of their clients by specifying Kennedy.

The Kennedy experience of almost half a century and the long and satisfactory records of Kennedy installations all over the country justify the confidence in Kennedy products that is backed by a definite guarantee of performance.

Send for the Kennedy Catalog describing the 500 different Kennedy types and sizes and explaining in detail the advantages of standardizing on Kennedy Valves.

Look for this Trademark K
And if it's there don't worry any more about your Valves and Fittings

Specify and insist upon having

The Kelly & Jones Co.
Valves and Fittings
Byers Genuine Wrought Iron Pipe
Republic Steel Pipe

California Steam & Plumbing Supply Co.
671-679 Fifth Street, Corner Bluxome
SAN FRANCISCO, CALIFORNIA
Standard Fence Co.  
WIRE AND IRON WORKS

245 Market St.  S. F. Kearny 2028

DESIGNERS - BUILDERS
FACTORY PROTECTION FENCE
AVIARY AND TENNIS COURT FENCE

WIRE GRILL WORK—WIRE SCREEN
FLEXIBLE WIRE CONVEYOR BELT
WIRE SPECIALTIES

320 North Los Angeles Street, Los Angeles, Cal. Phone 67188

Steel Bars  
FOR CONCRETE REINFORCEMENT
Cut to Length, Fabricated, Installed

BADT-FALK & CO.

Tel. Douglas 3466  346 Call-Post Bldg., 74 New Montgomery St., San Francisco

“WORK THAT SATISFIES”

ATHERLEY BROS.

PAINTING AND DECORATING
WINDOW SHADES MADE TO ORDER

2032 Polk Street, San Francisco
Phone Prospect 83

MARTEN & FREDERICK

UNITED WORK SHOPS

Designers, Makers and Contractors of Fine Furniture, Draperies and Complete Interiors.

1374 SUTTER ST., SAN FRANCISCO

GRIFFIN SHEET METAL WORKS

1720 H STREET FRESNO, CALIFORNIA

Heating and Ventilating Contractors
STEAM TABLES AND KITCHEN EQUIPMENT

Res. Tel. Merritt 3600

HERBERT BECKWITH

Building Construction

Formerly with
ARTHUR ARLETT

323 Newton Ave.
Oakland

D. ZELINSKY & SONS

PAINTERS AND DECORATORS

420 TURK STREET,
SAN FRANCISCO

CHARLES T. PHILLIPS  
CONSULTING ENGINEER

PACIFIC BUILDING  
HEATING  VENTILATION  WIRING  ILLUMINATION
PACIFIC HEATING COMPANY
Heating, Ventilating and Sheet Metal Work
Coal, Wood, Oil and Gas Heaters to Meet all Requirements
We Repair All Makes of Heating Appliances
WORK GUARANTEED Oakland 388
Corner Second and Grove Streets, OAKLAND, CALIF.

Atlas Heating and Ventilating Co., Inc.
ENGINEERS and CONTRACTORS
STEAM AND HOT WATER HEATING, FANS, BLOWERS,
FURNACES, POWER PLANTS—SHEET METAL WORK
Phone Douglas 378
Fourth and Freemont Sts., Bet. Bryant & Brannan, SAN FRANCISCO

CLARENCE DRUCKER
HERMAN LAWSON
LAWSON & DRUCKER
PLUMBING—HEATING—CONTRACTORS
450 HAYES STREET
SAN FRANCISCO, CAL.

HEATING
VENTILATION
FLOOR AND WALL TILING
SCOTT CO., Inc.
SUCCESSOR TO JOHN G. SUTTON CO.
243 MINNA STREET
SAN FRANCISCO

PLUMBING
SHEET METAL WORK

ALEX COLEMAN
CONTRACTING PLUMBER
706 ELLIS ST., SAN FRANCISCO
Phone FRANKLIN 1006

WM. F. WILSON COMPANY
MODERN SANITARY APPLIANCES
Special Systems of Plumbing for Residences, Hotels, Schools, Colleges, Office Buildings, Etc.
Phone Sutter 357
328-330 Mason Street, San Francisco.

W. H. PICARD
PLUMBING AND HEATING
Picard & Edwards
Heating, Ventilating and Power Plants
5656 College Ave.
5662 Keith Ave.
Piedmont 7522 Oakland, Calif.

THOS. BRODIE, Plumber
TINNING, ROOFING and CHIMNEY TOPS
Automobile Service Carrying All Repairs
2119 FILLMORE STREET (near California) - - - - San Francisco
MOUNT DIABLO CEMENT
COWELL SANTA CRUZ LIME
ALL KINDS OF
BUILDING MATERIALS
HENRY COWELL LIME AND CEMENT CO.
Phone Kearny 2095
No. 2 MARKET STREET, SAN FRANCISCO

Detroit Jewel Gas Ranges
FOR HOME, RESTAURANT, HOTEL AND CLUB
We carry a Full Line of Stock Sizes
NATHAN DOHRMANN CO.
Geary and Stockton Streets, San Francisco
PARMELEE-DOHRMANN CO.
SELLING AGENTS
43 6-444 S. BROADWAY, LOS ANGELES

Cast Iron Stairs and Store Fronts
Bank and Office Railings, Elevator
Enclosures and Fire Escapes.
C. J. HILLARD CO., Inc.
Nineteenth and Minnesota Streets
Telephone Mission 1763
SAN FRANCISCO, CAL.

NO GERMS HERE
Haws Improved Sanitary Drinking Faucet eliminates all possibility of contracting disease from dirty bulbs or un-sanitary bowls. Provided with an overhead cowl, the drinker's lips never touch the source of supply. A slanting stream throws the water from right to left and away from the bubbler, instead of straight up to fall back over the fountain head. Recommended for Schools and Public Playgrounds. A type used extensively by the U. S. Government. Manufactured by
Haws Sanitary Drinking Faucet Co., Inc.
1808 Harmon Street, Berkeley
Phone Piedmont 3742

Model No. 7A.
INTERIOR FIRST NATIONAL BANK OF SAN FRANCISCO

Chas. E. Gottschalk, Architect

All Plain and Ornamental Plaster Work Executed by
MACGRUER & SIMPSON, Contracting Plasterers

266 Tehama Street
San Francisco, Cal.

When writing to Advertisers please mention this magazine.
Arden Plaster

Now available in any quantity desired for immediate delivery.

*For further information call on your dealer or*

A. R. Robertson
Builders’ Exchange
180 Jessie St. San Francisco

Manufactured by

United States Gypsum Co.

Fire Proof Garages

Steel Frames

may be made in accordance with architect's plans.

Also Portable All Steel Buildings
Manufactured by

Benson & Benson
San Jose, Calif.

The General Fireproofing Company

Manufacturers of Herringbone Rigid Metal Lath, Corner Bead, Self Sentering, Peds, Diamond Mesh Lath, and waterproofing materials for Concrete

*Write for booklets describing, and answering every possible question you may ask concerning the use of fireproof and waterproof materials*

No. 20 Beale Street
San Francisco

Telephones Douglas 6616 Piedmont 4955-W

Complete Protection with Service at Cost

is furnished by the oldest, largest, and strongest mutual casualty company in America.

*Workmen's Compensation Insurance*

Employers’ Liability Insurance Automobile Liability Insurance

Also Other Forms of Liability Insurance

*Send for your copy of the booklet “30-30,” which tells the whole story*


GEORGE W. LINCH, District Manager

American Mutual Liability Insurance Company
245 State Street, Boston, Mass.

When writing to Advertisers please mention this magazine.
POSITIVE ELECTRIC INTERLOCK
(BAR LOCK TYPE)
Prevents Elevator Accidents Occurring at the Entrance Door
Approved by National Underwriters Laboratories—Meets requirements of Elevator Safety Orders of Industrial Accident Commission, State of California
ELEVATOR SUPPLIES COMPANY, Inc. 186 FIFTH STREET, SAN FRANCISCO
Capital $2,000,000 CALIFORNIA DEPARTMENT Surplus $2,250,000
THE FIDELITY AND CASUALTY COMPANY OF NEW YORK Prompt Service for
BONDS AND CASUALTY INSURANCE BALFOUR BUILDING SAN FRANCISCO, CAL.
National Surety Company of New York
The World’s Largest Surety Company Assets over $20,000,000
Pacific Coast Department: 105 MONTGOMERY ST., SAN FRANCISCO, CAL.
Frank L. Gilbert, Vice-President Phone, Sutter 2636
PACIFIC DEPARTMENT
Globe Indemnity Company
BONDS and CASUALTY INSURANCE for CONTRACTORS
FRANK M. HALL, formerly Robertson & Hall, Mgr.
444 California Street Phone Sutter 2280 SAN FRANCISCO
PHONE DOUGLAS 2370
R. McLERAN & CO.
GENERAL CONTRACTORS
HEARST BUILDING SAN FRANCISCO, CAL.
S. G. JACKSON
Building Construction
Office, 351 12th Street, Oakland Residence, 1098 Ranleigh Way
Lakeside 6750 Lakeside 3373
Phone Sutter 1533
ALFRED H. VOGT
GENERAL CONTRACTOR CONCRETE CONSTRUCTION
185 Stevenson Street, San Francisco
J. F. WAYNE Phone Fillmore 1856 Phone West 4911
WAYNE & WILLIAMS
R. C. WILLIAMS Phone West 4168
Painting Contractors
1621 Eddy St., San Francisco
Paper-Hanging and Interior Decorating
OPEN HEARTH

Reinforcing Steel Bars

Square Deformed — Immediate Shipment — Cut to required lengths

PACIFIC COAST STEEL COMPANY
Sales Office, Rialto Building. SAN FRANCISCO. Phone Sutter 1564

SUNSET HICKS-JUDD PRESS
ABBOTT-BRADY PRINTING CORPORATION
San Francisco

Builders of Complete Catalogs
460 Fourth Street  Douglas 3140

We supply reprints of THE ARCHITECT AND ENGINEER advertisements for circularizing

ACORN BRAND OAK FLOORING

for discriminating Architects and Builders, and characteristically a Tennessee product in every way, from the excellence of the wood itself to the superior millwork and careful grading.

Strable Hardwood Co. HARDWOOD LUMBER
Phone, Oakland 245
511-545 FIRST STREET, OAKLAND, CAL.

PASSENGER AND FREIGHT ELEVATORS
Made in San Francisco
Factory and Warehouse
166-180 Seventh Street  Phones: Market 1534 and 1535
SPENCER ELEVATOR COMPANY

JAS. I. KRUEGER
Representing Illinois Engineering Company, Chicago
Eureka Brass Works, Cincinnati
Manufacturers of Vacuum and Vapor Steam Heating Materials, Power Plant Equipment
Standard Radiator and Gate Valves, Pumps for Vacuum Systems of Heating
557-559 Pacific Building, San Francisco  Telephone Sutter 7057
MORTENSON CONSTRUCTION CO.
CONTRACTORS FOR STRUCTURAL STEEL AND IRON
H. MORTENSON, PRESIDENT
OFFICE AND SHOPS: CORNER 19TH AND INDIANA STREETS
PHONE: MISSION 5033
SAN FRANCISCO, CAL.

RAYMOND GRANITE COMPANY, Inc.
Owning and operating at Knowles, Madera County, the largest Quarry in the world
CONTRACTORS FOR STONE WORK
Designers and Manufacturers of Exclusive Monuments and Mausoleums
Main Office and Yard: No. 1 and 3 Potrero Avenue, San Francisco, California
Also at 1350-Palmetto Street, Los Angeles

Federal Ornamental Iron & Bronze Co.
Bank Counter Screens and Grille Work Our Specialty
Most Modern Equipment Throughout
Recent Contracts: BANK OF ITALY, FIRST NATIONAL BANK
16th Street and San Bruno Avenue, San Francisco
PHONE: Market 1011

L. J. RUEGG
RUEGG BROS.
CONTRACTORS AND BUILDERS
Phone Douglas 1599
719 Pacific Building, SAN FRANCISCO

Telephone Mission 58
A. A. Devoto, President
CENTRAL IRON WORKS, Inc.
STRUCTURAL STEEL
Office 2050 BRYANT STREET
SAN FRANCISCO, CAL.

C. S. HOFFMAN
Golden Gate Iron Works
STRUCTURAL STEEL AND ORNAMENTAL IRON CONTRACTORS
San Francisco

SCHRADER IRON WORKS, Inc.
STRUCTURAL STEEL CONTRACTORS
Fire Escapes, Waterproof Trap Doors, Ornamental Iron Work
1247-1249 HARRISON STREET
SAN FRANCISCO, CAL.
Telephone Market 337
Formal Garden Effects
may be obtained on your Country Estate within a period of two or three years.

MacRORIE-McLAREN CO.
141 Powell Street, San Francisco
Telephone Douglas 4442

THE increased use of piping material in homes, small factories, farms, garages, and water systems where the pressure does not exceed 75 pounds, has created a demand for these valves. They may be repacked while under pressure when the valve is fully opened.

CRANE CO.
Plumbing Supplies
Second and Brannan Sts. 348 Ninth Street
San Francisco Oakland
Western Safety Switches
Manufactured by
Western Safety Man'fg. Co. Inc.
Enclosed Externally Operated Safety Switches, Knife Switches, Metal Switch and Cut Out Boxes, Safety Switch Boards
Office, 247 Minna Street  SAN FRANCISCO
Telephone, Sutter 3008

Telephone DOUGLAS 2016
CHARLES FELIX BUTTE
BUTTE ELECTRICAL EQUIPMENT COMPANY
Trade Mark BEECO Registered
ELECTRICAL CONTRACTORS AND ENGINEERS
530 FOLSOM STREET  SAN FRANCISCO

L. SIEBERT
Drendell Electrical & Mfg. Co. Incorporated
SWITCHBOARDS, PANEL BOARDS, KNIFE SWITCHES, CABINETS, THEATRE INSTALLATIONS, PROTECTIVE POWER PANELS
1345-1353 Howard St., San Francisco Telephone Market 1753

MEYERS SAFETY SWITCH CO.
MANUFACTURERS OF
Enclosed Externally Operated ‘Safety’ Switches and Electrical Sheet Metal Products
575 HOWARD ST., SAN FRANCISCO Telephone Sutter 4213.
To Be "Low Bidder" Not Always Our Aim. Our most particular attention is given to prompt and skillful handling of all electrical work of any nature with "QUALITY AND SERVICE GUARANTEED." Our nation-wide organization and large experience in this field assures you always of fair estimates and absolute satisfaction.

F. E. NEWBERY ELECTRIC CO.
359 Sutter Street, San Francisco
Phone Sutter 521

San Francisco, Cal. Oakland, Cal. Los Angeles, Cal.

NE PAGE, McKENNY CO.
Electrical Engineers and Contractors
Phone Sutter 2369 589 Howard St., San Francisco, Cal.

GLOBE ELECTRIC WORKS
Estimates Furnished on Everything Electrical
ELECTRIC SUPPLIES
1959 Mission Street, bet. 15th and 16th
SAN FRANCISCO

Browne-Langlais Electrical Construction Co.
Agents for ROBBINS and MYERS MOTORS PACKARD MAZDA LAMPS
313 FIFTH STREET, SAN FRANCISCO
Telephone Douglas 976

G. WALTER SPENCER, Manager
SPENCER ELECTRIC CO.
CONTRACTING AND ENGINEERING
355 TWELFTH STREET
OAKLAND, CALIF.

M. E. RYAN
Electrical Contractor and Dealer
520 Clunie Building, San Francisco
Phone Garfield 3159
Heating and Ventilation

CONSULTING
Mechanical

ENGINEERS
Structural

Machine Design

Industrial Plant Design and Equipment

569 Monadnock Bldg.
Phone Douglas 7019
San Francisco
California

Superintendent of Construction
Specifications and Estimates
JOHN E. HAMILTON

Johns-Manville, Inc.
of California

SERVICE TO ARCHITECTS

Architectural Acoustics and Sound-Proofing
“Colorblende” Asbestos Shingles
Asbestos Prepared Roofings
Asbestos Built-Up Roofings
Mastic Industrial Flooring
Keystone Hair Insulating and Sound-Deadening

JOHNS-MANVILLE, INC., of California

DISPLAY ROOM
500 Post Street    San Francisco

When writing to Advertisers please mention this magazine.
The Elevator Floor
whether in Office Building, Hotel or Department Store, is subjected to a
great deal of wear and tear.

—SPECIFY—
INTERLOCKING RUBBER TILING

INTERLOCKING RUBBER TILING

material that is sure to give satisfaction.
installed in the Standard Oil Building, San Francisco.

New York Belting and Packing Co.

NEW YORK
San Francisco Branch 519 MISSION ST. Phone Douglas 1837
Small booklet of designs mailed on request.

QUALITY PRODUCTS
Proven by the Test of Time

MORAN'S PRESERVATIVE PAINTS
Genuine Preservative Paints for
Every Use. Will positively pre-
serve iron, steel, wood, concrete,
roofs, piles, poles, railroad ties
and all wood or metal surfaces
above or below earth or water.

A. W. CADMAN MFG. CO.
Cadman Valves.
The Plug Valve guaranteed not
to bind, stick, or leak. Complete
line of Power Equipment.

J. P. BELL & COMPANY
Associated Company
Commercial Export and Import Co., Inc.
Sole Representatives
Balboa Building SAN FRANCISCO Tel. Sutter 6833
Branches in Los Angeles, Salt Lake City,
Honolulu, Australia and New Zealand

"MPCO"

STONE SHINGLES

McCLENANAHAN PRODUCTS COMPANY

112 Kearny St. San Francisco

When writing to Advertisers please mention this magazine.
MILLER FOLDING IRONING BOARD
ELIMINATES WALL CABINET—IS INSTALLED IN KITCHEN CUPBOARD
NO PLASTER GROUNDS SAVES WALL SPACE AND LABOR
CASING OR PAINTING TIME AND MATERIAL
Exhibited by LANNOM BROS. MFG. CO. Send for Catalogue to W. N. MILLER
and sold by 362 Magnolia St., Oakland, Calif. 864 Thirteenth St., Oakland

MILLWORK Manufactured and Delivered Anywhere
Plans or Lists sent us for Estimates will have Careful and Immediate Attention.
and Manager MAIN OFFICE, YARD AND PLANING MILL — PALO ALTO, CALIFORNIA

School and Theatre
STAGES AND EQUIPMENT
EDWIN H. FLAGG
SCENIC COMPANY, Inc.
400 Pantages Bldg., San Francisco, Cal.

A. C. SCHINDLER, President. CHAS. F. STAUFFACHER, Secretary
THE FINK & SCHINDLER CO.
Manufacturers of INTERIOR WOODWORK AND FIXTURES
BANK, OFFICE AND STORE FITTINGS
SPECIAL FURNITURE
219-221 THIRTEENTH ST.
Bet. Mission and Howard Sts.
SAN FRANCISCO, CAL.
Telephone: Market 474

O. BAMANN, President ERNEST HELD, Vice-President
HOME MANUFACTURING CO.
BANK, STORE AND OFFICE FITTINGS
FURNITURE AND HARDWOOD INTERIORS
CABINET WORK OF EVERY DESCRIPTION
543 and 545 BRANNAN ST. Phone Kearny 1514 San Francisco, Cal.

MULLEN MANUFACTURING CO.
BANK, STORE AND OFFICE FIXTURES—CABINET WORK OF GUARANTEED QUALITY—CHURCH SEATING
Office and Factory:
Telephone Market 8692 64 Rausch St., Bet. 7th and 8th Sts., San Francisco

JAMES L. McLAUGHLIN
GENERAL CONTRACTOR
Phones Douglas 6645 - 6646 251 KEARNY STREET, SAN FRANCISCO

Dolan Wrecking & Construction Co.
(D. J. DOLAN)
Lumber, Lath, Nails, Shingles, Doors, Windows
and Plumbing Supplies, New and Second Hand
Phone Market 4264 Office and Yard, 1607-1639 MARKET ST., SAN FRANCISCO
United States Steel Products Co.
Rialto Bldg., San Francisco


MANUFACTURERS OF
Structural Steel for Every Purpose—Bridges, Railway and Highway—"Triangle Mesh" Wire Concrete Reinforcement—Plain and Twisted Reinforcing Bars—Plates, Shapes and Sheets of Every Description—Rails, Splice Bars, Bolts, Nuts, etc.—Wrought Pipe, Trolley Poles—Frogs, Switches and Crossings for Steam Railway and Street Railway—"Shelby" Seamless Boiler Tubes and Mechanical Tubing—"Americore" and "Globe" Rubber Covered Wire and Cables—"Reliance" Weatherproof Copper and Iron Line Wire—"American" Wire Rope, Rail Bonds, Springs, Woven Wire Fencing and Poultry Netting—Tramways, etc.

United States Steel Products Co.
OFFICES AND WAREHOUSES AT
San Francisco - Los Angeles - Portland - Seattle

When writing to Advertisers please mention this magazine.
CRUSHED ROCK
GRAVEL
SAND

For Building and Road Construction

COAST ROCK AND GRAVEL CO.
500 Call Building - San Francisco - Phone Sutter 3990
Plants at Niles, Fair Oaks, Oroville, Eliot, Piedra and Marysville

OTIS ELEVATORS

THE Architect or Engineer can specify "Otis Elevators," assured that the responsibility of the Otis Elevator Company extends beyond satisfactory installation. Buildings equipped with Otis Elevators enjoy the advantage of the prompt service and careful inspection rendered by any of our hundred offices. Such service means your clients' gratitude.

OTIS ELEVATOR COMPANY
OFFICES IN ALL PRINCIPAL CITIES OF THE WORLD
2300 STOCKTON STREET, SAN FRANCISCO, CAL.
The
ARCHITECT & ENGINEER

MARCH 1922

Published in San Francisco
50 cents a copy - $2.50 a year
A Space-saving Idea

The Pacific Combination Sink and Laundry Tray is a splendid fixture for apartments and bungalows. It provides laundry and kitchen sink facilities in a space $20\frac{1}{2} \times 48$ inches. Its height is adjustable. When not in use the laundry tray may be covered with a drain board.

Also furnished with a porcelain-enamedled iron back.

PACIFIC PLUMBING FIXTURES

For Sale by All Jobbers
Main Offices: 67 New Montgomery Street, San Francisco
Factories: San Pablo and Richmond, California
Branches: Portland and Los Angeles
LIKE every other proved unit in modern building construction, only the roof with a definite record of long service and absolute dependability will be considered in the planning and construction of industrial plants.

**PABCO 10 and 20 Year ROOFS**

are rapidly displacing the old style felt and gravel roofs on all classes of buildings. They are the choice of Architects, Engineers and owners, because of the following recognized advantages:

1. A complete and definite specification
2. Superior wearing qualities
3. Greater tensile strength
4. Highest grade materials
5. A proved method of construction

Write for specifications, samples and complete details

The PARAFFINE COMPANIES, INC.
San Francisco, California

---

Hurley-Mason Co.
Engineers and Contractors

William Brown
Roofing Contractor
Clocks Were Never Needed 'Til Time Acquired a Value

Electric Clock and Program Bell Systems
Automatic Control of Time Keeping Devices
for Schools, Hospitals, Public and Private Buildings, Banks, etc.,
Automatic Calling Systems

Plans, specifications and any engineering information, estimates, etc., cheerfully furnished to architects, engineers, or any one interested in this special line of work

Time Recorders
Time Stamps

RePAIRS

Pacific Electric Clock Co.
516 Wells Fargo Building
Telephone Sutter 803
San Francisco, Calif.

General Machinery & Supply Co.
OFFICES AND STORE: 39-51 STEVENSON STREET
TELEPHONE - PRIVATE EXCHANGE - SUTTER 6750

- AGENTS FOR -
EVERLASTING BLOW-OFF VALVES
WM. POWELL CO.'S
WHITE STAR VALVES - MODEL STAR VALVES
UNION COMPOSITE DISC VALVES AND PILOT GATE VALVES
YALE & TOWNE: CHAIN HOISTS
FISHER AND SWARTWOUT STEAM SPECIALTIES

ENGINEER'S, MACHINIST'S AND STEAM FITTER'S SUPPLIES
PIPE, PIPE-Fittings, VALVES, BELTING, PACKING AND HOSE
TRANSMISSION AND CONVEYING MACHINERY

SEND US YOUR INQUIRIES

When writing to Advertisers please mention this magazine.
LINOTILE FLOOR
MERCANTILE TRUST CO., SAN FRANCISCO

LINOTILE

The Floor with a Survival Value

FURNISHED AND INSTALLED BY

VAN FLEET-FREEAR CO.

420 SOUTH SPRING ST. 61 NEW MONTGOMERY ST.
LOS ANGELES SAN FRANCISCO

When writing to Advertisers please mention this magazine.
The Electric Food and Plate Warmer
Wherever meals are cooked and served, in apartments, residences and institutions, Prometheus is a highly valued asset. The wireless heating units placed independently of the shelves keep food hot and tasty until ready to serve and cannot injure the finest china.

Write for information and list of installations

The Prometheus Electric Co.
Manufacturers
511 West 42d Street, New York

Showrooms, M. E. HAMMOND
Mezzanine Floor Pacific Bldg., San Francisco

DEPENDABILITY
"Since 1858"
LINOLEUMS
WINDOW SHADES
Carpets
Draperies
Rugs
Estimates Furnished

D. N. & E.
Walter & Co.
562-572 Mission Street
SAN FRANCISCO
Los Angeles Portland Seattle

"Standard"

THIRTY-SIX years experience manufacturing and installing Electric Time Keeping Systems. Helpful engineering data cheerfully furnished architects, engineers and school boards, insuring satisfactory results, and a direct factory branch office completely equipped to render immediate service

The Standard
Electric Time Company
461 Market St., San Francisco, Cal.
Telephone Sutter 241
All-in-One Factory
Now in Operation

All-in-One Lavatories and common sinks are now being manufactured at our plant in Sacramento, which has been fully equipped with the latest and best machinery for the manufacture of All-in-One Plumbing Fixtures.

Within thirty days we shall be making daily deliveries of All-in-One Bathtubs and Lavatories—the fixtures that eliminate all of the exposed metal parts of the old-style fixtures by casting the hot and cold water inlets, waste pipe and overflow integral with the fixture itself.

All-in-One Fixtures are more efficient and economical in operation, more attractive in appearance and easier to keep clean—but they cost no more than the old style fixtures.

Write Dept. A for Free Illustrated Booklet Telling You About These New and Better Bathroom Fixtures

All-in-One Plumbing Fixture Corporation
231 Oschner Bldg., Sacramento
The Architect and Engineer

Pacific Rolling Mill Co.

SUPPLIERS OF
FABRICATED STRUCTURAL STEEL, Forgings, Bolts, Rivets, Frogs, Switches, Cast Iron Castings

General Office and Works
17th and MISSISSIPPI STS., SAN FRANCISCO
Telephone Market 215

Beam, Angle, Channels, and Universal Mill Plates for immediate shipment from stock

---

Western Iron Works


Steel Wheelbarrows in Stock

STRUCTURAL IRON AND STEEL CONTRACTORS

141-147 Beale St. and 132-148 Main St. SAN FRANCISCO
Phones: GARFIELD 2575--2576

---

Steel Frame, California State Building, Civic Center, San Francisco.

FABRICATED BY
THE PALM IRON AND BRIDGE WORKS (Incorporated)
15th and R Streets, Sacramento

Bliss & Faville, Architects

---

UNION CONSTRUCTION CO.

CONTRACTORS AND ENGINEERS
Steel for All Types of Building Construction and Bridges
All Classes of General Machinery
Tank and Pipe Work
Gold Dredges and Their Equipment

BALFOUR BLDG.,
San Francisco Sutter 2790
Key Route Basin, Oakland Lakeside 6300

When writing to Advertisers please mention this magazine.
ARCHITECTURAL TERRA COTTA
Gladding, McBean & Company, Crocker Bldg.,
San Francisco.
Tropic Pottery, Inc., Glendale, Cal.

AUTOMATIC SPRINKLERS
Grinnell Co. of the Pacific, 453 Mission St., San Francisco.

ANNEALING & FORGING
Extrusion Steel Company, 134 Market St., San Francisco.

AUTOMOBILES
W. L. Houghton Co., Geary St., at Van Ness Ave.,
San Francisco.

BANKS
First National Bank, Post and Montgomery streets, San Francisco.

BANK FITTINGS AND INTERIORS
Fink & Schindler, 218 13th St., San Francisco.

BELTING AND PACKING
New York Belting and Packing Company, 519 Mission St., San Francisco.
H. N. Cook Belting Co., 401 Howard St., San Francisco.
Smith-Booth-Usher Co., San Francisco and Los Angeles.

BLACKBOARDS

BLINDS—VENETIAN AND DIFFUSELITE
J. G. Wilson Corporation, Metropolitan Bldg.,
Los Angeles; Waterhouse-Wilcox, Underwood Bldg., San Francisco.
Western Blind & Screen Co., Long Beach Ave.,
Los Angeles; C. F. Weber & Co., San Francisco,
Los Angeles, and Phoenix, Ariz.

BOILERS
California Hydraulic Engineering & Supply Co.,
70-72 Fremont St., San Francisco.


BOOK BINDERS
Abbott-Brady Printing Corp’n, 460 Fourth St., San Francisco.

BONDS FOR CONTRACTORS
Bonding Company of America, Kohn Bldg., San Francisco.

BUREAUS & SHIPPERS
Insurance Co. of New York,
Insurance Exchange Bldg., San Francisco.
Globe Indemnity Co., 444 California St., San Francisco.

FIRE EXTINGUISHERS
Century Fire Extinguisher Co., 151 Potrero Ave., San Francisco.

GASSING GOODS, CASTINGS, ETC.
H. Mueller Manufacturing Co., 635 Mission St., San Francisco.

BRICK, PRESSED, PAVING, ETC.
Richmond Pressed Brick Co., Sharon building, San Francisco.
Plant at Richmond, Cal.

UNITED MATERIALS Co., Sharon Bldg., San Francisco.

CANNON & Co., SACRAMENTO; and 77 O'Farrell street, San Francisco.

BRICK & CEMENT COATING
Armorite and Concreta, manufactured by W. P. Fuller & Co.,
all principal Coast cities.
The Paraline Companies, Inc., 34 First St., San Francisco.

WADSWORTH, HOWLAND & Co., Inc., Boston, Mass.,
manufacturers of Bay State Brick & Cement Coating.

BRICK STAINS
Samuel Cabot Mfg. Co., Boston, Mass.,
agencies in San Francisco, Oakland, Los Angeles, Portland, Tacoma, and Spokane.

Armorite and Concreta, manufactured by W. P. Fuller & Co.,
all principal Coast cities.

BUILDERS’ HARDWARE
Joost Bros., agents for Russell & Erwin Hardware,
1053 Market St., San Francisco.
The Stanley Works, New Britain, Conn.,
cost sales offices, San Francisco, Los Angeles, and Seattle, Wash.

Palace Hardware Company, Agents Corbin goods,
581 Market St., San Francisco.

When writing to Advertisers please mention this magazine.
An Index to the Advertisements

Haws Sanitary Drinking Faucet Co. ........ 134
Kelley, Wm., Chas. & Son .................. 134
Herrick Company ................................ 152
Hub, Hubbard Co. ............................... 144
Johnson & Co. .................................. 152
Holbrook, Merrill & Steston ............................ 141
Home Mfg. Co. .................................. 152
Houser, W. L. Co. ................................ 26
Hunt, Robt., W. & Co. ............................... 132
Hunter & Hudson ................................ 140
Illinois Engineering Co. ............................. 148
Independent Automatic Sprinkler Co. ............ 148
Jackson, S. G. ................................... 150
Jarvis, T. P. Mfg. Co. .............................. 43
Johns-Manville Co. of Calif ......................... 140
Johnson, H. T. .................................. 143
Johnson Service Co. ................................ 11
Jost Brothers ..................................... 140
Judson Mfg. Co. .................................. 152
Kennedy Valve Mfg. Co. ............................. 135
Kiesel, J. R. ...................................... 142
Kiefer, E. E. .................................... 12
Lannom Bros. Mfg. Co. ............................. 158
Larsen-Siegert Co., Inc. ............................. 136
Lawson & Drucker ................................ 146
Linton & Vezey ................................... 144
Littlefield, R. W. .................................... 144
Los Angeles Pressed Brick Co. ..................... 137
Lapton Steel Sash ................................ 122
MaeGuer & Simpson ............................... 147
McKee & Co. ..................................... 150
McGraw & Otter ................................... 72
Margett, Ed ....................................... 24
Marshall & Stearns Co. ............................. 138
Martin & Fredericks ......................... 158
McClanahan Products Co. ........................... 157
McCray Refrigerator Co. ......................... 102
Medina Stainless Cement ....................... 150
Meders Safety Switch Co. ................. 153
Michel & Pfeifer, Iron Works ............... 117
Montague Range & Furnace Co. .......... 156
Morton Construction Co. ............................ 152
Mott Co. of Calif. ................................ 156
Muller Mfg. Co. ................................. 158
Mushet Mfg. Co. ................................. 142
Namao Sons, Inc. .................................. 132
Nason, R. N., & Co. ............................... 9
Nathan Dohrmann Co. ......................... 147
National Terra Cotta Society .......................... 129
National Mill & Lumbar Co. ..................... 32
National Surety Co. ............................. 150
Nelson, James A. ............................... 156
Page, McKeever & Co. ........................... 157
Newberry Electric Co. ............................. 155
New York Belting and Packing Co. .......... 157
Norris Co., L. A. ................................. 28
Oak Flooring Mf's Ass'n ............................ 19
Ocean Shore Iron Works .................. 132
Old Mission Portland Cement Co. .......... 35
Ottis Elevator Co. .............................. 160
Pacific Coast Steel Company ................... 157
Pacific Electric Clock Co. ...................... 157
Pacific Fire Extinguisher Co. ............... 158
Pacific Gas and Electric Co. ............... 42
Pacific Heating Co. ............................... 146
Pacific Mfg. Co. .................................. 152
Pacific Materials Co. ............................ 44
Pacific Plumbing Fixtures, 2d Co. .......... 146
Pacific Porcelain Ware Co., 2d Cover ...... 146
Pacific Rolling Mills ............................. 6
Pacific Hardware Co. ............................. 38
Palm Iron Works .................................. 46
Palmer, P. A. ................................... 147
Paradise Companies, Inc. ..................... 147
Parker, K. E., Co., Inc. ............................ 144
Petroleum Sanitary Sink Co. ................. 32
Pickle Co. ...................................... 144
Pendelton Co. ................................... 146
Pitcher Door Hanger ............................. 32
Ponca Stone Mfg. Co. ............................. 148
Pneumatic Painting Machinery Co. ........... 10
Pomeroy Hardware Co. ............................. 11
Prometheus Electric Co. .......................... 4
Qualls, A. & Son ................................ 12
Ray Manufacturing Co. .............................. 42
Raymond Granite Co. ............................. 148
Reliance-Grant Elevator Equipment Co. .... 139
Richards-Wilcox Mfg. Co. ..................... 31
Richmond Pressed Brick ...................... 128
Roberts Mfg. Co. .................................. 134
Rolph, Mills & Co. ................................ 17
Ruegg Bros. ..................................... 136
Rucker-Pullen Desk Co. ............................ 140
Ryan, M. E. .................................... 18
Safety Electric Co. .................................. 125
San Francisco Electric Co. ..................... 11
Santa Fe Lumber Co. ............................. 15
Scott Co. ......................................... 146
Scott, L. A., & W. .................................. 12
Schwerin, Wm., J. ................................ 130
Simmons, O. M., Co. ............................. 17
Simmonds Mfg. Co. ............................. 12
Sloane, W. J. ................................... 17
Smith-Booth-Usher Co. ......................... 29
Smith & Eggleston ............................... 12
Sommer, L. M. .................................. 144
Soud, Edward L., Co. ............................. 132
Spencer Electrical Co. ............................. 13
Spencer Elevator Co. .............................. 148
Spott Electrical Co. .............................. 145
Standard Electric Time Co. ..................... 145
Standard Electric Time Co. ..................... 145
Standard Mfg. Co. .............................. 117
Standard Varnish Works ..................... 117
Stanley Works, The ............................. 115
Stanley Mfg. Co. .................................. 144
Stewart Sales Co. .............................. 135
St. Francis Hotel ............................... 117
Straine Hardwood Co. ............................. 153
Sunset Lumber Company ..................... 153
S.W. Tile Co. ................................... 24
Tiltz Engineering & Equipment Co. ........ 143
Tittle, H. S., Co. .................................. 155
Tompkins-Smelting Co. ............................ 153
Tormey Co. .................................... 140
Tropico Potteries, Inc. ........................... 135
Trout, Robt. ................................. 143
Truscon Steel Co. ................................ 30
Uhle Bros. ...................................... 38
Union Construction Co. ..................... 142
Unit Construction Co. ............................ 142
Unit Electric Co. ................................ 127
United Materials Co. ............................. 125
U. S. Gypsum Co. ............................... 156
U. S. Metal Products Co. ....................... 36
U. S. Steel Products Co. ....................... 159
Van Fleet Preer Co. ............................. 3
Vermont Marble Co. ............................. 3
Victory Manufacturing Co. .................. 141
Vogt, Alfred H. ................................ 150
Vukicevich & Bagge .............................. 141
Wadhows, Howland & Co., Inc. ............. 134
Haiter, D. N., & Co. & Co. ................. 134
Wayne Oil Tank & Pump Co. ................. 29
Wayne & Williams .............................. 17
Weber, C. P., Co. ................................ 153
Wentworth, P. W. ............................... 130
West Coast Lumber Co. ....................... 130
Western Blind & Screen Co. .................. 39
Western Sanitary Co. ............................. 39
Western Iron Works ............................. 6
Western Pipe and Steel Co. .................. 20
Wilson, H., & Co. ............................... 119
Wilson, W. P., Co. ............................. 146
Witt, G. E., Co. ................................ 44
Zelinsky D. & Sons ............................. 145
Zouzi Drawn Metals Co. ..................... 21
The Pneumatic Painting Machine Co.
G. H. GRENVILLE, Manager
1046 Monadnock Building, S. F.

Phone Sutter 471

ARCHITECTS' SPECIFICATION INDEX—Continued

CONTRACTORS, GENERAL
Barrett & Hillg, 918 Harrison St., San Francisco.
Larsen-Siegist Co., Inc., 807 Claus Spreckels Bldg., San Francisco.
R. W. Littlefield, 357 12th St., Oakland.
Lawton & Vehey, Call building, San Francisco: Plaza building, Oakland.
K. E. Parker Co., Inc., Chumie Bldg., San Francisco.
Unit Construction Co., Phelan Bldg., San Francisco.
J. D. Hannah, 142 Sansome St., San Francisco.
John M. Bartlett, 357 Twelfth St., Oakland.
Chas. Stockholm & Son, Monadnock Bldg., San Francisco.
Herbert Beckwith, 323 Newton Ave., Oakland.
Collman & Spieidel, 546 Monadnock Bldg., San Francisco.
Clinton Construction Company, 140 Townsend St., San Francisco.
Monson Bros., 251 Kearny Street, San Francisco.
Fontanella & Teza, 1682 Eddy Street, San Francisco.
Geo. Wagner, 251 Kearny street, San Francisco.
T. B. Goodwin, 180 Jessie St., San Francisco.
Robert Trost, 26th and Howard Sts., San Francisco.
I. M. Sommer, 401 Balboa Bldg., San Francisco.
S. G. Jackson, 351 12th St., Oakland.
Jas. L. McLaughlin, 251 Kearny Street, San Francisco.
Alfred H. Vogt, 185 Stevenson street, San Francisco.

CONTRACTORS' EQUIPMENT
Edward R. Bacon Co., 51 Minna St., San Francisco, and Los Angeles.
Garfield & Co., Heirst Bldg., San Francisco.
Smith, Booth, Usner Co., 60 Fremont St., San Francisco; 228 Central Ave., Los Angeles.

CONVEYING MACHINERY
Meese & Gottfried, San Francisco, Los Angeles, Portland and Seattle.

CONVENIENCE OUTLETS

CORK TILE
Van Fleet-Freear Co., Sharon Bldg., San Francisco.

CRUSHED ROCK
Coast Rock & Gravel Co., Call-Post Bldg., San Francisco.

DAMP-PROOFING AND WATERPROOFING
Gunns, Carle & Co., Inc., 444 First street, San Francisco.

Hill, Hubbell & Company, 115 Davis St., San Francisco.
"Pabo" Damp-Proofing Compound, sold by the Paraflne Companies, Inc., San Francisco, Los Angeles, Portland and Seattle.

DOOR HANGERS
Pitcher Hanger, sold by National Lumber Co., 326 Market St., San Francisco.
Stanley Works, New Britain, Conn. Monadnock Bldg., San Francisco.

DRINKING FOUNTAINS
Crane Company, San Francisco, Oakland, and Los Angeles.
Pacific Porcelain Ware Co., 67 New Montgomery St., San Francisco.
Haines, Jones & Cadbury Co., 857 Folsom St., San Francisco.

DUMB WAITERS
Spencer Elevator Company, 166 7th St., San Francisco.

ELECTRICAL CONTRACTORS
Butte Electrical Equipment Company, 530 Folsom St., San Francisco.
Butte Electric & Manufacturing Co., 534 Folsom St., San Francisco.
Central Electric Company, 185 Stevenson street, San Francisco.
NePage, McKerny Co., 589 Howard St., San Francisco.
Newbery Electrical Co., 359 Sutter street, San Francisco.
Pacific Fire Extinguisher Co., 424 Howard St., San Francisco.
Globe Electric Works, 1959 Mission St., San Francisco.
M. E. Ryan, Redwood City, and 520 Chumie Building, San Francisco.
H. S. Tittle, 766 Folsom St., San Francisco.
Spencer Electric Co., 355 12th street, Oakland.

ELECTRIC PLATE WARMER
The Prometheus Electric Plate Warmer for residences, clubs, hotels, etc. Sold by M. E. Hammond, Pacific Bldg., San Francisco.

PNEUMATIC WATER PRESSURE SYSTEMS
ALL SIZES AND TYPES—For Private Homes and Public Buildings

CALIFORNIA HYDRAULIC ENGINEERING AND SUPPLY CO.
80 Fremont Street
San Francisco

When writing to Advertisers please mention this magazine.
TEMPERATURE REGULATION

JOHNSON SERVICE COMPANY

(OF MILWAUKEE — ESTABLISHED 1885)

Manufacturers and Installers of JOHNSON Heat and Humidity CONTROL

For schools, residences, hospitals, banks, public auditoriums, also every plant and all kinds of industrial plants—Hot water tank regulators, air and water reducing valves.

Rialto Bldg., SAN FRANCISCO 665 Van Nuys Bldg., LOS ANGELES

ARCHITECTS’ SPECIFICATION INDEX—Continued

ELECTRICAL SUPPLIES AND EQUIPMENT

Garnett Young & Co., 612 Howard St., San Francisco.

Butte Electrical Equipment Co., 530 Folsom St., San Francisco.

Harvey Hubbell, Inc., Bridgeport, Conn., represented in San Francisco by Garnett Young & Co., 612 Howard street.

Sperry Electric Company, 56-65 Columbia Square, San Francisco.


ELEVATORS

Otis Elevator Company, Stockton and North Point, San Francisco.

Spencer Elevator Company, 166 7th St., San Francisco.

San Francisco Elevator Co., 860 Folsom street, San Francisco.

ENGINEERS—CONSULTING, ELECTRICAL, MECHANICAL

Chas. T. Phillips, Pacific Bldg., San Francisco.

Hunter & Hudson, Rialto Bldg., San Francisco.

ELEVATOR DOOR HARDWARE


ESTIMATOR—BUILDINGS AND ENGINEERING WORKS

Arthur Fridlde, 186 Stevenson street, San Francisco.

FAIENCE TILE

Tegelico Pottery, Inc., Glendale, Cal.

FELT—ASPHALT, DEADNING

The Paraffine Companies, Inc., San Francisco, Los Angeles, Portland and Seattle.

FENCES—WIRE AND IRON

Standard Fence Construction Co., 245 Market St., San Francisco, and 316 12th St., Oakland; 320 Los Angeles St., Los Angeles.

FILLING STATION EQUIPMENT

S. F. Bowser & Co., Inc., 612 Howard St., San Francisco.

Wayne Oil Tank & Pump Co., 631 Howard St., San Francisco, 330 S. Los Angeles St., Los Angeles.

FIRE ESCAPES

Michel & Peiffer Iron Works, 1415 Harrison street, San Francisco.

Palm Iron & Bridge Works, Sacramento.

Western Iron Works, 141 Beale St., San Francisco.

FIRE-PROOF DOORS

Forder-Cornice Works, 269 Potrero avenue, San Francisco.

U. S. Metal Products Co., 330 10th street, San Francisco.

Fire Protection Products Co., 3117 20th street, San Francisco.

FIRE SPRINKLERS—AUTOMATIC

Grinnell Company, 453 Mission St., San Francisco.

Independent Automatic Sprinkler Co., 72 Natoma street, San Francisco.

Pacific Fire Extinguisher Co., 424 Howard St., San Francisco.

FIRE RETARDING PAINT

The Paraffine Companies, Inc., 34 First St., San Francisco.

FIXTURES—BANK, OFFICE, STORE, ETC.

Home Manufacturing Company, 543 Brannan St., San Francisco.

The Fink & Schindler Co., 218 13th St., San Francisco.

Mullen Manufacturing Co., 64 Rausch St., San Francisco.

C. F. Wood & Co., 985 Market St., San Francisco, and 210 N. Main St., Los Angeles, Cal.

FLOOR TILE

Mangrum & Otter, 827 Mission St., San Francisco.

S. & S. Tile Company, San Jose.

FLOOR VARNISH

Bass-Hueter and San Francisco Pioneer Varnish Works, 816 Mission St., San Francisco.

Fifteen for Floors, made by W. P. Fuller & Co., San Francisco.


The Paraffine Companies, Inc., San Francisco, Los Angeles, Portland and Seattle.

FLOORS—HARDWOOD

Oak Flooring Manufacturers’ Association of the United States, Ashland Block, Chicago, Ill.

Parrott & Co., 320 California St., San Francisco.

Strable Hardwood Company, 811 First street, Oakland.

FLOORS—MASTIC—FLOOR COVERING

Hill, Hubbell & Company, 115 Davis St., San Francisco.

The Paraffine Companies, Inc., San Francisco, Los Angeles, Portland and Seattle.

FLUMES

California Corrugated Culvert Co., West Berkeley, Calif.

Jas. A. Nelson, 517 Sixth St., San Francisco.

FUEL OIL SYSTEMS

S. T. Johnson Co., 1337 Mission St., San Francisco.

S. F. Bowser & Co., Inc., 612 Howard St., San Francisco.

Wayne Oil Tank & Pump Co., 631 Howard St., San Francisco.

SAN FRANCISCO ELEVATOR CO., Inc.

ELEVATORS

Automatic, Electric, Hydraulic, Belt Power, Automatic Dumbwaiters and Handpower Machines. Push Button Passenger Elevators a Specialty

Telephone Kearny 2443

860 FOLSOM STREET, SAN FRANCISCO

When writing to Advertisers please mention this magazine.
ARCHITECTS' SPECIFICATION INDEX—Continued

HARDWALL PLASTER
Henry Cowell Lime & Cement Co., San Francisco.

HARDWARE

HARDWOOD LUMBER—FLOORING, ETC.
Parrott & Co., 320 California St., San Francisco. Stable Hardware Company, First street, near Broadway, Oakland.

HEATERS—AUTOMATIC, GAS, ELECTRIC

HEATING AND VENTILATING CONTRACTOR'S EQUIPMENT, ETC.

Haines Heating Systems

ASSURE

Heating Satisfaction

O. M. SIMMONS CO.

When writing to Advertisers please mention this magazine.
ARCHITECTS' SPECIFICATION INDEX—Continued

Griffin Sheet Metal Works, Fresno.

HOLLOW TILE BLOCKS
Goscin & Co., plant at Sacramento; 770 O'Farrell street, San Francisco.
Los Angeles Pressed Brick Co., Frost Bldg., Los Angeles.

HOSPITAL FIXTURES
Mott Company of California, 553 Mission St., San Francisco.

HOSPITAL SIGNAL SYSTEM
Chicago Signal Co., represented by Garnett Young & Co., 612 Howard St., San Francisco.

HOTELS
St. Francis Hotel, Powell, Geary and Post Sts., San Francisco.

ICE MAKING MACHINERY
Cyclops Iron Works, 837 Folsom St., San Francisco.

INGOT IRON
"Armco" brand, manufactured by American Rolling Mill Company, Middletown, Ohio, and 10th and Bryant streets, San Francisco.

INSPECTIONS AND TESTS
Robert W. Hunt & Co., 251 Kearny St., San Francisco.

INSULATION—CORK
Van Fleet-Freear Co., Sharon Bldg., San Francisco.

INSURANCE BROKERS
William Healey & Son, Crocker Bldg., San Francisco.

INTERIOR DECORATORS
Althery Bros., 2032 Polk St., San Francisco.
Martin & Frederick, 1374 Sutter St., San Francisco.
John Breuner Co., 281 Geary St., San Francisco.
The Torey Co., 1042 Larkin St., San Francisco.
A. Quandt & Son, 374 Guerrero street, San Francisco.

KITCHEN CABINETS
Hoover Kitchen Cabinet Store (O. K. Brown, Mgr.), Pacific Bldg., San Francisco.

KITCHEN EQUIPMENT
Griffin Sheet Metal Works, Fresno.

LAMP POSTS, ELECTROLIERS, ETC.
J. L. Mott Iron Works, 553 Mission St., San Francisco.

LANDSCAPE ARCHITECT
Emerson Knight, 704 Market street, San Francisco.

LANDSCAPE GARDENERS
MacMillan-McLaren Co., 141 Powell St., San Francisco.

LATHING AND PLASTERING
MacGruer & Simpson, 226 Tehama St., San Francisco.
A. Knowles, Call-Post Bldg., San Francisco.

LATHIING MATERIAL
Pacific Materials Co., 525 Market St., San Francisco.
Truscon Steel Co., Tenth St., near Bryant, San Francisco.

LIGHT, HEAT AND POWER
Great Western Power Company, Stockton St., near Sutter, San Francisco.

LIGHTING Fixtures
Thomas Day Company, Mission, near Third street, San Francisco.
Electric Appliance Co., 807 Mission street, San Francisco.

LIME
Henry Cowell Lime & Cement Co., 2 Market St., San Francisco.

LINOLEUM
D. N. & E. Walter & Co., 562 Mission St., San Francisco.
The Paraffine Companies, factory in Oakland; office, 34 First St., near Market, San Francisco.
W. & J. Sloane, 216 Sutter street, San Francisco.

LUBRICATION OIL STORAGE TANKS AND PUMPS
S. F. Bowser & Co., Inc., 612 Howard St., San Francisco.

LUMBER
Dudfield Lumber Co., Palo Alto, Cal.
Hart-Wood Lumber Co., Fifth and Berry Sts., San Francisco.
Pope & Talbot, foot of Third St., San Francisco.
Santa Fe Lumber Co., 16 California street, San Francisco.
Sunset Lumber Company, First and Oak Sts., Oakland.

MAGNESITE FLOORING, STUCCO, ETC.
Derite Mfg. Co., 116 Utah Street, San Francisco; Metropolitan Bldg., Los Angeles.

MAIL CHUTES
American Mailing Device Corp., represented on Pacific Coast by Waterhouse-Wilcox Co., 523 Market St., San Francisco.

MANTELS—WOOD, TILE, ETC.
Mangrum & Otter, 827-831 Mission St., San Francisco.
Fink & Schindler, 218 12th street, San Francisco.

MANUAL TRAINING EQUIPMENT
Smith-Smith-Usher Co., San Francisco and Los Angeles.

RAY COOK MARBLE CO.
IMPORTED AND DOMESTIC MARBLES
For Building Construction
Factory and Office, Foot of Powell St., Oakland

When writing to Advertisers please mention this magazine.
MARBLE
American Marble and Mosaic Co., 25 Columbus Square, San Francisco.
R. C. Cook Marble Company, foot of Powell street, Oakland.
Joseph Musto Sons, Keenan Co., 355 N. Point St., San Francisco.
Vermont Marble Co., Coast branches, San Francisco, Portland and Tacoma.
The kitchens Marble Company, 503 Fifth Ave., New York; also Chicago, Philadelphia and San Francisco.

METAL DOORS AND WINDOWS
Fire Protection Products Co., 3117 20th St., San Francisco.
Waterhouse-Wilcox Co., Inc., 523 Market St., San Francisco.
U. S. Metal Products Co., 330 Tenth St., San Francisco.

METAL FURNITURE
Forderer Corinck Works, 269 Potrero avenue, San Francisco.

MILL WORK
Dudley Lumber Co., Palo Alto, Cal.
Pacific Manufacturing Company, San Francisco, Los Angeles, Oakland and Santa Clara.
National Mill and Lumber Co., San Francisco and Oakland.
The Fink & Schindler Co., 218 13th St., San Francisco.

NOTARY PUBLIC
William Healey & Son, 208 Crocker building, San Francisco.

OFFICE EQUIPMENT
Rucker-Fuller Co., 677 Mission St., San Francisco.
F. W. Wentworth & Co., 539 Market St., San Francisco.
Stewart Sales Co., 247 Rialto Bldg., San Francisco.

OIL BURNERS
Pess System Co., 220 Natoma St., San Francisco.
S. T. Johnson Co., 1337 Mission St., San Francisco.
G. E. Wilcox Co., 862 Howard St., San Francisco.
F. L. Warner, 696 20th St., Oakland.

OIL STORAGE AND DISTRIBUTING STATIONS
S. F. Bowser & Co., Inc., 612 Howard St., San Francisco.
S. T. Johnson Co., 1337 Mission St., San Francisco.
Wayne Oil Tank & Pump Co., 631 Howard St., San Francisco; 830 S. Los Angeles St., Los Angeles.

ORNAMENTAL IRON AND BRONZE
California Artistic Metal and Wire Co., 349 Seventh St., San Francisco.
Federal Ornamental Iron and Bronze Co., 1611 St. and San Bruno Ave., San Francisco.
Michel & Pfeffer Iron Works, 1415 Harrison street, San Francisco.
Palm Iron & Bridge Works, Sacramento.
Schrader Iron Works, Inc., 1247 Harrison St., San Francisco.

OVERHEAD CARRYING SYSTEMS
California Hydraulic Engineering & Supply Co., 70 72 Fremont St., San Francisco.

PAINT FOR STEEL STRUCTURES, BRIDGES, ETC.
The Paraffine Companies, Inc., 34 First St., San Francisco.
Hill, Hubbell & Company, 115 Davis street, San Francisco.
Wadsworth & Company, makers of Bay State Brick and Cement Coating, Boston, Mass.
James Hambly & Son, Distributors in San Francisco and Los Angeles.

PAINTING—SPRAY EQUIPMENT
Pneumatic Painting Machy, Co., 1046 Monadnock Bldg., San Francisco.

PAINTING, TINTING, ETC.
Athely Bros., 2032 Polk St., San Francisco.
Wayne & Williams, 1621 Eddy St., San Francisco.
I. K. Kissel, 1747 Sacramento St., San Francisco.
D. Zelinsky & Sons, San Francisco and Los Angeles.
The Tormey Co., 581 Geary St., San Francisco.
Fick Bros., 475 Haight St., San Francisco.
A. Quandt & Son, 374 Guerrero street, San Francisco.

PAINTS, OILS, ETC.
Magner Bros., 414-424 Ninth St., San Francisco.
Bas-Plueter Paint Co., Mission, near Fourth St., San Francisco and all principal coast cities.
W. P. Fuller & Co., all principal Coast cities.
The Paraffine Companies, Inc., San Francisco, Los Angeles, Portland and Seattle.

PARTITIONS—FOLDING AND ROLLING

PIPE—STEEL AND WROUGHT IRON
Western Pipe & Steel Co., 444 Market St., San Francisco; 1738 N. Broadway, Los Angeles.

PIPE FITTINGS

PLASTER

PLASTERING CONTRACTORS
A. Knowles, Call building, San Francisco.
MacGruer & Simpson, 266 Tehama street, San Francisco.

PLAYGROUND APPARATUS
A. G. Spalding & Bros., 625 Market St., San Francisco.

PLUMBING CONTRACTORS
Alex Coleman, 706 Ellis St., San Francisco.
Thos. Brodie, 2119 Fillmore street, San Francisco.
Gilley-Schmid Company, 198 Otis street, San Francisco.
Hateley & Hateley, Milan Bldg., Sacramento.
Scott Co., Inc, 243 Minna St., San Francisco.
Wm. F. Wilson Co., 328 Mason St., San Francisco.
W. H. Picard, 5656 College avenue, Oakland.

PLUMBING FIXTURES, MATERIALS, ETC.
All-In-One Plumbing Fixture Corporation, 231 Ogilvie building, Sacramento.
California Steam & Plumbing Supply Co., 671 Fifth St., San Francisco.
Crane Co., San Francisco, Oakland, Los Angeles.
Gilley-Schmid Company, 198 Otis St., San Francisco.

When writing to Advertisers please mention this magazine.
SANTA FE LUMBER CO.
A. J. RUSSELL, Mgr.
Wholesale and Retail
LUMBER

POLES AND PILING
OIL RIG AND SHIP TIMBERS
SAGINAW SPECIAL SHINGLES
16 California Street
San Francisco, Calif.

Phones:
Kearny 2073 - 2074

from tree to Consumer
Pine and Redwood Lumber
SASH DOORS AND MILL WORK
SUNSET LUMBER COMPANY
MANUFACTURERS—WHOLESALE AND RETAIL
Main Office and Yards:
FIRST AND OAK STREETS, OAKLAND
Phone Oakland 1820

POPE & TALBOT
Manufacturers, Exporters and Dealers in
Lumber, Timber, Piles, Spars, etc.
Office, Yards and Planing Mills
859-869 THIRD ST., SAN FRANCISCO, CAL.

Mills, Port Gamble, Port Ludlow and Utsalady, Washington

PACIFIC MANUFACTURING COMPANY
MILLWORK, SASH AND DOORS

Hardwood Interior Trim a Specialty
Main Office:
SANTA CLARA, CALIF.

SAN FRANCISCO, 177 Stevenson Street
OAKLAND, 1001 Franklin Street

LOS ANGELES, 928 Washington Building
SAN JOSE, 16 North First Street

When writing to Advertisers please mention this magazine.
PLUMBING FIXTURES, MATERIALS, ETC.  
Continued.
Haines, Jones & Cadbury Co., 857 Folsom St., San Francisco.
H. Mueller Manufacturing Company, 635 Mission St., San Francisco.
J. L. Mott Iron Works, D. H. Gulick, selling agent, 553 Mission St., San Francisco.
Pacific Sanitary Manufacturing Co., 67 New Montgomery St., San Francisco.
Edward C. Osborne, 423 Monadnock Bldg., San Francisco.
West Coast Porcelain Manufacturers, Rialto building, San Francisco.
Wm. F. Wilson Co., 328 Mason St., San Francisco.

POLES AND PILING  
Santa Fe Lumber Co., 16 California street, San Francisco.

POWER TRANSMITTING MACHINERY  
Meese & Gottfried, San Francisco, Los Angeles, Portland, Ore., and Seattle, Wash.
PRELIMINARY ESTIMATES, VALUATIONS  
Arthur Priddle, 185 Stevenson street, San Francisco.

PUBLIC QUANTITY SURVEY PLAN  
Arthur Priddle, 185 Stevenson street, San Francisco.

PLUMBING  
Chicago Pump Co., represented by Garnett, Young & Co., 612 Howard St., San Francisco.
California Hydraulic Engineering & Supply Co., 70 Fremont St., San Francisco.
Simonds Machinery Co., 117 New Montgomery St., San Francisco.
Ocean Shore Iron Works, 558 Eighth St., San Francisco.

PUMPS—HAND OR POWER, FOR OIL AND GASOLINE  
S. F. Bowser & Co., Inc., 612 Howard St., San Francisco.
S. T. Johnson Co., 1337 Mission St., San Francisco.
Wayne Oil Tank & Pump Co., 631 Howard St., San Francisco; 830 S. Los Angeles St., Los Angeles.

QUANTITY SURVEYOR FOR CONTRACTORS  
Arthur Priddle, 185 Stevenson street, San Francisco.

RADIATORS—ELECTRIC STEAM  
William J. Schwarin, 217 Rialto Building, San Francisco.

Radiator Traps  

REINFORCING STEEL  
Edward L. Soule, Rialto Building, San Francisco.
Rand-Falk & Co., Call Bldg., San Francisco.
Pacific Coast Steel Co., Rialto Building, San Francisco.
Truscon Steel Co., 527 10th St., San Francisco.

REFRIGERATORS  

ROOFING CONTRACTORS  
Bender Roofing Company, Monadnock Bldg., San Francisco.

ROOFING AND ROOFING MATERIALS  
"Malthoid" and "Ruberoid," also "Palweo" ten and twenty year roofs, manufactured by the Paraffine Companies, Inc., San Francisco.

RUBBER TILING  
New York Belting and Packing Company, 518 Mission St., San Francisco.

SAFETY TREADS  
Pacific Materials Co., 525 Market St., San Francisco.

SAND  
Coast Rock & Gravel Co., Call Bldg., San Francisco.
Del Monte White Sand, Del Monte Properties Co., 401 Crocker Bldg., San Francisco.

SASH AND CABLE CHAINS  

SCENIC PAINTING—DROP CURTAINS, ETC.  
The Edwin H. Flagg Scenic Co., 1638 Long Beach Ave., Los Angeles.

SCHOOL FURNITURE AND SUPPLIES  
Rucker-Fuller Desk Company, 677 Mission St., San Francisco.
Stewart Sales Co., 247 Rialto Building, San Francisco.

SHEATHING AND SOUND DEADENING  
The Paraffine Companies, Inc., 34 First St., San Francisco.

ARE YOU INTERESTED IN INSURANCE?  
WM. HEALEY & SON  
INSURANCE BROKERS  
208 CROCKER BLDG., SAN FRANCISCO  

W. W. HEALEY, NOTARY PUBLIC

When writing to Advertisers please mention this magazine.
ARCHITECTS’ SPECIFICATION INDEX—Continued

SHEET METAL WORK
Forderer Cornice Works, 269 Potrero ave., San Francisco.
Griffin Sheet Metal Works, Fresno, Cal.
Pacific Heating Company, Second and Grove streets, Oakland.
U. S. Metal Products Co., 330 10th street, San Francisco.
Fire Protection Products Co., 3117 20th street, San Francisco.

SHINGLE STAINS
Bass-Hueter Paint Company, all principal Coast cities.
Cabot’s Croseote Stains, sold by Pacific Building Materials Co., 525 Market St., San Francisco.
Fuller’s Pioneer Shingle Stains, made by W. P. Fuller & Co., San Francisco.

SHINGLES—COMPOSITION, UNIT AND STRIP
The Paraphine Companies, Inc., San Francisco, Los Angeles, Portland and Seattle.

SINKS—COMPOSITION

STEEL HEATING BOILERS
California Hydraulic Engineering & Supply Co., 70-72 Fremont St., San Francisco.

STEEL TANKS, PIPE, ETC.
Ocean Shore Iron Works, 538 Eighth St., San Francisco.
S. T. Johnson Co., 1337 Mission St., San Francisco.
Western Pipe and Steel Co., 444 Market street, San Francisco.

STEEL AND IRON—STRUCTURAL
Central Iron Works, 621 Florida St., San Francisco.
Michel & Pfeffer Iron Works, 1415 Harrison street, San Francisco.
Lienon & Benson, The Alameda, San Jose.
Mortenson Construction Co., 19th and Indiana Sts., San Francisco.
Pacific Rolling Mills, 17th and Mississippi Sts., San Francisco.
Palm Iron & Bridge Works, Sacramento.
U. S. Steel Products Co., Rialto Bldg., San Francisco.
Schrader Iron Works, Inc., 1247 Harrison St., San Francisco.
Union Construction Co., 604 Mission street, San Francisco, and Key Route Fell, Oakland.
Western Iron Works, 141 Beale St., San Francisco.

STEEL PRESERVATIVES
Hill, Hubbell & Company, 115 Davis St., San Francisco.

STEEL ROLLING DOORS

STEEL SASH
Bayley-Springfield solid steel sash, sold by Pacific Materials Co., 525 Market St., San Francisco.
Michel & Pfeffer Iron Works, 1415 Harrison street, San Francisco.
U. S. Metal Products Company, 330 Tenth St., San Francisco.
Truscon Steel Company, 527 Tenth street, San Francisco.

STORE FRONTS

STUDDING—FIREPROOF STEEL
Steel Studding Company, 1216 Polson St., San Francisco.

SUMP AND BILGE PUMPS
California Hydraulic Engineering & Supply Co., 70-72 Fremont St., San Francisco.

SWITCHES AND SWITCHBOARDS
Wemco Safety Switch, manufactured and sold by W. E. Mushet Co., 502 Mission St., San Francisco.

THEATER AND OPERA CHAIRS
Rucker-Fuller Desk Co., 677 Mission street, San Francisco.
THE ARCHITECT AND ENGINEER

ARCHITECTS' SPECIFICATION INDEX—Continued

THERMOSTATS FOR HEAT REGULATION
Johnson Service, Rialto Bldg., San Francisco.

TILE FOR ROOFS, MANTELs, ETC.
Cannon & Co., Sacramento; and 77 O'Farrell St., San Francisco.
Gladding, McBean & Co., Crocker Bldg., San Francisco.
S. & S. Tile Co., 4th and Carrie streets, San Jose.

TRANSMISSION MACHINERY
Meese & Gottfried Co., San Francisco, Los Angeles, Portland and Seattle.

TRAVELING CRANES
Cyclops Iron Works, 837 Folsom St., San Francisco.

VALVES—PIPES AND FITTINGS
California Steam & Plumbing Supply Co., 671 Fifth St., San Francisco.
Crane Radiator Valves, manufactured by Crane Co., Second and Brannan Sts., San Francisco.
Grinnell Co., 453 Mission St., San Francisco.
O. M. Simmons Co., 113 Mission St., San Francisco.
W. E. Mushet Co., 502 Mission St., San Francisco.

VALVE PACKING
N. U. Cook Belting Co., 317 Howard St., San Francisco.
Everlastling Blow-off Valves, General Machinery and Supply Co., 39 Stevenson street, San Francisco.

VARNISHES
W. P. Fuller Co., all principal Coast cities.
Standard Varnish Works, 55 Stevenson St., San Francisco.

VENETIAN BLINDS, Awnings, ETC.
Western Blind & Screen Co., 2702 Long Beach Ave., Los Angeles.

VITREOUS CHINAWARE
Pacific Porcelain Ware Company, 67 New Montgomery St., San Francisco.
West Coast Porcelain Manufacturers, Rialto Building, San Francisco.

WALL BEDS, SEATS, ETC.

WALL BOARD

WALL PAINT

WALL PAPER AND DRAPERIES
The Tormey Co., 681 Geary St., San Francisco.
W. & J. Sloane, 216-228 Sutter St., San Francisco.
Uhl Bros., San Francisco.

WATERPROOFING (see Damp-proofing)

WATER SUPPLY SYSTEMS
Kewane Water Supply System—Simonds Machinary Co., agents, 117 New Montgomery St., San Francisco.
Smith-Booth-Usher Co., San Francisco and Los Angeles.

WHEELBARROWS—STEEL
Western Iron Works, Beale and Main Sts., San Francisco.

WHITE ENAMEL
"Gold Seal," manufactured and sold by Bass-Hueber Paint Co. All principal Coast cities.
The Paraffine Companies, Inc., San Francisco, Los Angeles, Portland and Seattle.

WINDOW SASH CHAIN

WINDOW SHADES
W. & J. Sloane, 216 Sutter street, San Francisco.
D. N. & E. Walter, 563 Mission street, San Francisco.

WINDOWS, REVERSIBLE, CASEMENT, ETC.
Crittall Casement Window Co., Detroit; Waterhouse & Wilcox, San Francisco, representatives.
Hauser Window Co., 157 Minna St., San Francisco.

WIRE FENCE
Standard Fence Co., 245 Market street, San Francisco; and 310 12th street, Oakland.

GLOBE AUTOMATIC SPRINKLERS
Will protect your building and business from destruction by fire and reduce your Insurance Rate. Write for estimates.

Pacific Fire Extinguisher Company
FIRE PROTECTION ENGINEERS
424-440 Howard Street, San Francisco
Manufacturing Plant, 298 Fremont St.

When writing to Advertisers please mention this magazine.
As an American, as an architect or an engineer, we know you will want to protect your clients against the substitution of inferior Japanese Oak Flooring.

The building public is sometimes misled by an attractive lower price to try out the imported article. It is a costly experiment. Many have been compelled to rip up the Japanese and lay down the American, at great expense.

To the expert eye Japanese Oak Flooring at once betrays its inferiority by its lack of the beautiful "flower" which is characteristic of the American. While it shows its brashy nature by breaking off evenly and usually shows a tendency to warp after laying.

The above trade-mark alone identifies the genuine.

We will be glad to send you our three free booklets, in colors, on the advantages and economies of American Oak Flooring. They contain accurate and valuable information for the files of the architect or engineer. They cost you nothing.

Write Today to
OAK FLOORING MFG. CO.
Of the United States
1036 Ashland Block, Chicago, Ill.
"Simple—Strong—Efficient"

That's what users say of the

STEWARD
Tilting Drum
CONCRETE MIXERS
with
Hercules Engine drive

And there's one thing more to add—they're
Reasonably Priced

For sale by
Smith-Booth-Usher Co.
CONTRACTORS and INDUSTRIAL EQUIPMENT
SAN FRANCISCO
50-60 Fremont Street
LOS ANGELES
228-238 Central Avenue

Everything OPENLY PRICED in our Illustrated Priced Stock Bulletin.

Steel Water Tanks
For High Buildings
For high pressure Water Systems, Automatic Fire Sprinklers, etc.

ALSO:
Designers, Fabricators and Erectors of General Plate Work, including Hydro-Pneumatic Pressure Tanks, Hemispherical Bottom Tanks and Towers, Oil and Water Tanks, Pipe Lines, Etc. "Western" Corrugated Culvert Pipe

Western Pipe and Steel Company
OF CALIFORNIA
444 MARKET STREET
SAN FRANCISCO
1758 NORTH BROADWAY
LOS ANGELES

When writing to Advertisers please mention this magazine.
The Architect Can Help

YOU CAN HELP TO SAVE MILLIONS OF DOL-
LARS ANNUALLY. Plate glass breakage through
defective installation is one of your problems.

Such breakage can be eliminated through right con-
struction. Right construction is that which measures up to the
following

GLAZING SPECIFICATIONS
All Metal Sash, Corner Bars, Division Bars and Self-
Adjusting Setting Blocks Used In Store Fronts Must
Be Listed By the Underwriters' Laboratories.

Strict adherence to this specification would mean that
millions of dollars would be saved to the insurance com-
panies as well as to the store owners.

All Zouri-Key-Set Sash, Corner and Division Bars and
Self-Adjusting Setting Blocks have been listed by the
Underwriters' Laboratories.

Consult Our Nearest Representative
We have 198 distributors in the United States and Canada, each car-
rying a complete stock of Zouri and International construction.

Ask either of the firms listed below for
full particulars of Zouri construction

COBBLEDICK-KIBBE GLASS COMPANY
Oakland and San Francisco
CALIFORNIA PAINT & GLASS CO.
Los Angeles, California

Zouri Drawn Metals Company
Factories and General Offices:
1632 EAST END AVE.
CHICAGO HEIGHTS, ILLINOIS

When writing to Advertisers please mention this magazine.
THE window glass throughout the new and beautiful Hotel Sovereign is the product of the American Window Glass Co.

In evenness and freedom from imperfections in double or single strength, its uniform high quality and dependability have long since commended it to architects through the country.

American Window Glass Co.
General Offices, Pittsburgh, Pa.

Branches in all principal cities as listed in Sweet's Catalog.

THE SOVEREIGN HOTEL
Chicago, Ill.

Architect, WALTER K. CAHLSCHLAGER
Glazed by SHARP, PARTRIDGE & CO.

INVESTMENT VALUE
STEEL SASH PRODUCTS

Lupton Steel Sash Products represent more than so many square feet of windows at moderate cost.

They represent an idea—the idea of health, good workmanship and efficiency, due to ample fresh air and light.

Let us tell you about the different types of Lupton Steel Sash Products and how they may be used.

Represented by
WATERHOUSE-WILCOX CO.
San Francisco Los Angeles San Diego

*J. McCRAKEN CO. H. G. LANAHAN & CO. F. T. CROWE CO.
Portland Spokane Seattle Tacoma

When writing to Advertisers please mention this magazine.
ARCHITECTS.
Promoters of the Public Weal.

As in the old days when the armor-maker stood before his King without baring his head, so are architects today held mightier than statesmen.

For architecture is a profession that conserves public health, elevates public ideals and makes the whole world a better place in which to live. Such a profession takes meaningless timbers and stones, fashioning them into objects of beauty and utility wherein man may labor and play.

But the public little appreciates what you’ve done to make these things possible. They see only the finished product, by which you are judged. They see only the final coat of enamel,—not the carefully built-up undercoats.

Therefore, it behooves you not to take chances with your specifications. Insist on getting products that are Time-Tested. Our own, for instance, which have 73 years of knowing how back of them.

\[\text{\textcopyright W. P. FULLER & CO.}\]

Fuller’s Pioneer White Lead has been specified by architects for years, because it has an unfailling habit of making good. Master and journeyman painters are pleased when Fuller’s is selected for the job.

Fuller’s Silkenwhite Enamel for all interior work where a quality product is demanded. Obtainable in high gloss finish and eggshell effect.

Fuller’s Washable Wall Finish is a decorative and durable finish for interior walls of plaster, or wall-board. The soft-toned colors lend themselves admirably to any decorative scheme.

Fullerwear, “the spar varnish for every purpose.” Can be applied to all varnishable surfaces, either interior or exterior. Withstands wear and tear to a remarkable degree.

Fuller’s Fifteen for Floors is a varnish that is unexcelled for quick-drying, toughness, durability and beauty of finish. Resists the wear and tear of modern conditions. Not affected by hot and cold liquids.

Pioneer Shingle Stains—protective, preserving, and beautifying. A most desirable product for all shingled surfaces.

When writing to Advertisers please mention this magazine.
Steam Heating and Ventilating
For Commercial and Public Buildings
Furnace Heating for the Home
Mangrum & Otter, Inc.
827-831 Mission Street San Francisco, Cal.
Phone Kearny 3155

S. & S. TILE CO. A. L. SOLON and E.P.SCHEMMEL
MANUFACTURERS OF
HAND-MADE TILES FOR WALLS AND FLOORS,
REPRODUCTIONS OF OLD SPANISH AND
MOORISH GLAZED TILES.
Factory, 4th and Carrie Sts. San Jose, Cal.

"GIANT METAL," "RED METAL" AND STEEL
SASH CHAINS
COPPER AND STEEL
CABLE CHAINS
THE SMITH AND EGGE MFG. COMPANY
BRIDGEPORT, CONN.
Rawlins & Smith 604 Mission Street, SAN FRANCISCO
5151 W. Hellman Bldg., LOS ANGELES Coast Agents

GLADDING, McBEAN & CO.
MANUFACTURERS CLAY PRODUCTS
CROCKER BUILDING, SAN FRANCISCO
WORKS, LINCOLN, CAL.

When writing to Advertisers please mention this magazine.
When and how to Specify Medusa White Cement and Medusa Waterproofing

Two technical booklets, designed to give you and your specification writer just the facts you want about non-staining portland cement and integral waterproofing.

They are profusely illustrated with interesting views of office buildings and industrial structures—views of parks and residential estates—all showing practical applications of Medusa Stainless White Cement and Medusa Waterproofing.

Specifications are concise, authoritative, and explicit, but comprehensive; they cover such subjects as non-staining portland cement stucco, “overcoating” of old buildings, swimming pool construction, non-staining mortar, etc.; together with the whole subject of the integral waterproofing of mass concrete.

A request on your letterhead will bring you copies of both booklets, with our compliments.

THE SANDUSKY CEMENT COMPANY, Dept. P, Cleveland, Ohio

Manufacturers of Medusa Stainless White Cement (Plain or Waterproofed); Medusa Gray Portland Cement (Plain or Waterproofed); and Medusa Waterproofing (Powder or Paste).

PACIFIC COAST DISTRIBUTORS
Riverside Portland Cement Co., Los Angeles, Cal.
The Ford car unfailingly answers the needs of the man who desires economical and dependable motor transportation.

The Ford is a valuable ally of the business concern and indispensable to the salesman or the sales force that wishes to cover an extensive territory at the least cost and with the greatest speed.

For eighteen years, we have catered to the needs of the Ford buying public. In our new location and our new building at 11th and Market streets we are in a better position than ever to serve.

Visit our new sales and service quarters. Night service in the garage.

William L. Hughson Co.

Since 1903
Market at 11th St., San Francisco
Park 4380

Seattle  Portland  Oakland  Los Angeles  San Diego
American OAK FLOORING for American Homes

Because American Oak excels that from Japan in BEAUTY, in "FLOWER," in COLOR, in FIBER, in STRENGTH, in WEAR.

And Bruce Oak Flooring because it embodies all the inherent superiority of America's finest growth in rugged virgin Oak from the South's famous hardwood timber forests.

And Bruce Oak Flooring because every piece bears the trade mark of its maker as a signature to sterling quality—and also the Association symbol as a guarantee of standard grades and trade ethics.

Bruce Oak Flooring is serving thousands of thoroughly satisfied users in homes of every size, as well as in apartments, stores, public and semi-public buildings—Ample stocks on hand for prompt delivery through local dealers, contractors and floor layers.

Instructive Literature On Request

E.L. Bruce Co., Manufacturers

MEMPHIS, TENNESSEE
Wherever there is need for refrigeration service, in the small or large residence, hotel, hospital or institution, there is a McCray to meet that need. More than 30 years' devotion to the problems of refrigeration has made the McCray standard equipment.

Write today for the New McCray catalogs.

No. 95—for Residences
No. 72—for Grocers
No. 75—for Hotels and Institutions

No. 64—for Markets
No. 53—for Homes and Institutions

McCRAY REFRIGERATOR CO.
2261 LAKE STREET
KENDALLVILLE, IND.

**CLINTON**

**WELDED WIRE FABRIC AND LATH**


L. A. NORRIS CO.
140 Townsend Street
Phone Kearny 5375  San Francisco

**The GOLD MEDAL MAIL CHUTE**

INSTALLED IN
THE NEW
SAN FRANCISCO
CITY HALL
AND THE
WHITE MARBLE
MERRITT
BUILDING,
LOS ANGELES

Given highest award at
Panama-Pacific Interna-
tional Exposition, 1915.

Waterhouse-Wilcox Co.
California
Representatives
523 Market Street
SAN FRANCISCO
331 E. 4th Street,
LOS ANGELES
F. T. CROWE & CO.
Seattle, Wash.
THE J. McCracken Co.
Portland, Oregon
American Mailing
Device Corporation

NOTE ONLY MIXERS
but a full line of nationally-known equipment, as well.
We have prepared for a brisk building season.

"Get it from BACON"

Edward R. Bacon Company
51-61 Minna Street, San Francisco
165 E. Jefferson St.
Los Angeles

When writing to Advertisers please mention this magazine.
ARCHITECTS and engineers who conscientiously strive to give their clients satisfaction invariably choose Wayne equipment. Accuracy, dependability, economy, safety and long life are inherent qualities of Wayne gasoline and oil systems. Wayne engineers will gladly co-operate with you in working out any of your problems.

WAYNE OIL TANK & PUMP COMPANY
746 Canal Street
San Francisco, Cal.

Ft. Wayne, Ind.

Los Angeles Office
830 S. Los Angeles Street

Phone Garfield 1330

Phone Main 1600

OIL CONSERVATION SYSTEMS

DEL MONTE &
FAN SHELL BEACH
WHITE SAND

With our WASHING and DRYING PLANT in full operation, we can now ship promptly above SANDS fresh water washed, and steam dried, or direct from pits.

Del Monte Properties Company
Phone Sutter 6130 401 Crocker Building San Francisco

When writing to Advertisers please mention this magazine.
STEEL BARS

for reinforcing that are themselves sturdily reinforced with a service that measures up to the mark of

444 Market Street
Phone Sutter 2720

STEEL BARS

Largest Stock of Reinforcing Bars and Fire Proof Material on the Pacific Coast

TRUSCON DAYLIGHT SASH
All Sizes Carried in Stock
San Francisco Warehouse
TRUSCON STEEL COMPANY
CHAS. HOLLOWAY, JR., Branch Manager
527 Tenth Street, San Francisco

When writing to Advertisers please mention this magazine.
WHERE SERVICE IS PARAMOUNT
R-W "Ideal” Hardware Excels

Safety and simplicity are the two essentials of passenger elevator door hardware. R-W Ideal elevator hardware embodies both essentials to the point of perfection.

The fact that R-W Ideal hardware is gaining in public favor every day is demonstrated in the increasing number of installations. Many of the elevators in America's largest buildings recently completed, or now under construction, are fully equipped with Ideal hardware.

We have practical representatives who will gladly cooperate with architects in the selection of the right elevator door hardware to fit the particular need.

Let us send you our latest catalog (0-2) and complete data relating to Ideal Hardware.

Richards-Wilcox Mfg. Co.

Sewage Ejectors  Bilge Pumps
Condensation Pumps and Receivers  Return Line Vacuum Pumps
Horizontal Centrifugal Pumps

CHICAGO PUMP COMPANY
Telephone: Douglas 4220

GARNETT YOUNG and COMPANY
612 Howard Street, San Francisco

When writing to Advertisers please mention this magazine.
For the
Exacting Client

Pitcher
Hangers
Give Satisfaction

Smooth Running — Noiseless — Efficient
Inexpensive

MANUFACTURED BY
NATIONAL MILL & LUMBER CO.
318 Market Street, San Francisco, Cal.
Telephone Kearny 3580

Snow White

Built with a Clean Smooth Surface. Petrium Sanitary Sinks answer every requirement. They are non-porous, non-absorbent and lye-proof. There are no crevices or corners to catch the dirt and grease. Therefore Specify this sink. Can be installed in any home or apartment—new or old. A California product.

Display at
Hoosier Store, Pacific Bldg., San Francisco

Petrium Sanitary Sink Company
Factory and Office, West Berkeley

When writing to Advertisers please mention this magazine.
This Cozy “Peerless” Breakfast Nook

combining beauty with utility, can be embodied in your apartment house or home building plans at surprisingly small cost. This equipment includes: drop seats, drop table (with leaves folding into wall pocket, between windows), and extra size ironing board in pocket with table.

THE HOOSIER STORE

PACIFIC BUILDING

SAN FRANCISCO
MAGNESITE STUCCO AND FLOORING

MAGNESITE FINISH

DORITE
MANUFACTURED BY THE
DORITE MANUFACTURING CO.
116 UTAH STREET, SAN FRANCISCO

AGENCIES:
METROPOLITAN BLDG., LOS ANGELES
501 5TH AVENUE, N. Y.

CONTRACTOR'S MACHINERY

OSHKOSH Pavers
OSHKOSH MIXERS
INSLEY GRAVITY PLANTS
OSHKOSH EVEREADY SAW RIGS
INSLEY STEEL CARS and TRACK
HOISTING BUCKETS, HOPPERS, GATES, ETC.
STEAM AND ELECTRIC HOISTS
EVERYTHING USED BY CONTRACTORS
CARRIED IN STOCK BY
GARFIELD & CO.
Hearst Building, San Francisco Phone Sutter 1036

RA-DO FUMELESS GAS RADIATORS

ALL CAST IRON—3 Sizes (3, 5, and 7 Sections)
The Ideal "Year-Round" Heating System
For The Home—New or Old
Easiest and Cheapest to Install
Lowest Operating Cost
BAIRD - BAILHACHE COMPANY
MANUFACTURERS
478 Sutter St., San Francisco Phone Sutter 6858

When writing to Advertisers please mention this magazine.
Each shipment of "OLD MISSION" Portland Cement is guaranteed not only to equal but to surpass all requirements of the standard specifications for Portland Cement as adopted by the U. S. Government and by the American Society for Testing Materials. A Guarantee Certificate is mailed with the bill of lading of each car, giving number of car, date packed, and number of barrels, over the signature of the chief chemist.
ECONOMY  STRENGTH

"Bois" System

of

Metal Stair Construction

Using Interlocking Treads and Risers

ARE USED IN ALL TYPES OF BUILDINGS

Full Information and Estimates Furnished

Manufactured by

UNITED STATES METAL PRODUCTS CO.

330 Tenth Street, San Francisco, Cal.

Hauser Reversible

This Modern Apartment House in San Francisco designed by Architect E. E. Young, is equipped with the Hauser Type Fixture.

Manufactured and installed by

Hauser Window Co.

Window Fixtures

157 Minna Street, Phone

SAN FRANCISCO Kearny 3706
Exterior and Interior Views of the National Bank at Elizabeth, New Jersey.

Marble: Interior and exterior executed by George Brown & Co., New York, N.Y.
Rough stock furnished by Tompkins-Kiel Marble Co., New York, N.Y.

Architects: Dennison & Hirons, New York, N.Y.

Both the exterior and interior of the National Bank at Elizabeth, New Jersey, were finished in Napoleon Gray Marble.

This is only one of many such institutions for which we have been called upon to supply the marble.

In the erection of this building, over 3,900 cubic feet of Napoleon Gray Marble were used.
For samples of marble or stone—write to us.

Tompkins-Kiel Marble Company
505 Fifth Avenue
New York City
Chicago Philadelphia San Francisco
QUALITY HARDWARE
CORBIN
LOCKS AND BUILDERS' HARDWARE
PALACE HARDWARE CO.
"San Francisco's Leading Hardware Store"
581 MARKET STREET. SUTTER 6060

Kewanee Water System


Simonds Machinery Co.
117-121 New Montgomery St.
SAN FRANCISCO
Phone Kearny 1457

UHL BROS.
San Francisco
Oakland
Seattle
Los Angeles
Portland

Pacific Coast Distributors
Murphy Varnishes and Enamels

For
Hotels
Apartment Houses
Hospitals
Factories
Etc.

Barreled Sunlight

Pack your Radiator Valves with
Palmetto Twist Packing

It can be unstranded to fit any size valve. It does not get hard.

H. N. COOK BELTING CO.
401-433 Howard St. San Francisco, Cal.

When writing to Advertisers please mention this magazine.
INDIRECT DAYLIGHT
~ for Banking Rooms ~

From Coast to Coast
WESTERN VENETIAN BLINDS are satisfactorily serving hundreds of modern banks, office buildings, schools, etc.

Let us send you illustrated booklets and general details and specifications.

WESTERN BLIND & SCREEN CO.
27th AND LONG BEACH AVE.
LOS ANGELES, CAL.
Fuller & Goepp
32 Page Street, San Francisco
Telephone Market 499

MANUFACTURERS OF
ART AND LEADED GLASS MIRRORS
Dealers in WHITE Glass for Table Tops, Counter Tops, Sink Backs, Etc. Complete Stock—Prompt Deliveries
Oakland Office, Syndicate Bldg. Tel. Oakland 1165

CANNON & CO.
Clay Products
Denison Interlocking Tile
Face Brick
Hollow Tile
Roof and Floor Tile

Factory and General Offices:
SACRAMENTO, CALIFORNIA

When writing to Advertisers please mention this magazine.
THE latest Bowser Piston-Type Measuring Pump (illustrated) is either hand or air-driven and exemplifies the high standard of service set by Bowser Equipment.

The motive power being air, the usual fire hazard in handling gasoline by power is eliminated.

Bowser Equipment accurately, economically and safely meets all requirements for gasoline and oil storage and service.

Whether it is in a garage, railroad, factory or dry cleaning plant, you are best serving your clients when you specify Bowser Equipment.

Write for Illustrated Booklet A-03

S. F. Bowser & Company, Inc.

1303 Creighton Ave., FORT WAYNE, INDIANA
Sales Offices (with Service Departments) throughout the United States and in Principal cities of the World.

612 Howard Street,
San Francisco, Calif.

1225 So. Olive Street,
Los Angeles, Calif.

LONDON PARIS HAVANA SYDNEY

English Casements and Windows

for banks, offices, schools, hospitals, etc.

Made in varied designs to meet all conditions

For artistic residences and other substantial buildings

Crittall Casement Window Co.
Manufacturers
Detroit, Michigan

CRITTALL Steel Casements
Ray Rotary Fuel Oil Burners
For Steam and Hot Water Boilers
ADAPTED TO ANY TYPE OF BOILER OR FURNACE—High or Low Pressure, 10 to 300 H. P.

W. S. RAY MANUFACTURING CO.
Manufacturers of Ray Crude Oil Burners
Ray Oil, Gas, Coal or Wood Heavy Steel Ranges

OFFICE AND SALESROOM:
29 Spear St., SAN FRANCISCO
Phone Kearny 199

PLANT AND SERVICE:
Eosworth, Milton and S. P. R. R.
Phone Mission 5022

GENUINE SQUIRES STEAM TRAPS
Great Durability and High Efficiency.
Main joints above water line.
Valve and Seat accessible without breaking joints.
Every Trap unconditionally guaranteed.

W. E. MUSHET CO
SOLE AGENTS
Phone Sutter 4797

502 Mission Street
San Francisco, Cal.

ARCHITECTS - BUILDERS - CONTRACTORS

MODERN CONDITIONS practically DEMAND gas heating.
Be fore-handed and include provision for the use of GAS HEATING APPLIANCES in your plans and construction program. If an estimate on a complete heating system will help, do not hesitate to call on us.

Pacific Gas and Electric Company
FESS SYSTEM TURBINE FUEL OIL BURNER
"Worthy of your consideration"

We are the originators of the mechanical atomizing type oil burner and the largest exclusive manufacturers of oil burning equipment in the west. All parts of our equipment are manufactured in our own plant, thereby assuring prompt and efficient service at all times.

Specify "FESS SYSTEM"—it has no equal

FESS SYSTEM COMPANY, Inc.
218-220 Natoma St., San Francisco. Phones Sutter 6927-6928.

Agencies in all principal cities.

Member of the Oil Burners Manufacturers' Association of California.

SIMPLEX BURNERS


BUNTING IRON WORKS

1215 FIRST NATIONAL BANK BLDG.
SAN FRANCISCO Phone Sutter 3225

Member of the Oil Burners Manufacturers' Association of California.

OIL BURNER EQUIPMENTS

Low Pressure Air and Rotary Mechanical Atomizing Types
Refrigerating and Ice-Making Machines
Direct Expansion and Brine Circulating Systems

T. P. JARVIS MANUFACTURING CO.
CONTRACTING ENGINEERS AND MANUFACTURERS
275 Connecticut Street, San Francisco Phone Market 3397

Member of the Oil Burners Manufacturers' Association of California.

JOHNSON'S ROTARY CRUDE OIL BURNER

Can be installed in any BOILER or FURNACE
Gives Satisfactory Results. Simple to Operate—Automatic—Safe. Let us tell you more about this Oil Burner.

S. T. JOHNSON CO.
1337 Mission Street - San Francisco, Cal. Phone Market 2735

Agencies: SEATTLE LOS ANGELES FRESNO SAN DIEGO SACRAMENTO

Member of the Oil Burners Manufacturers' Association of California.

When writing to Advertisers please mention this magazine.
THE ARCHITECT AND ENGINEER

CONTENTS FOR MARCH, 1922

Dining Room, House of the Late Mr. Frank Pixley, Pebble Beach, Cal. Frontispiece

PAGE

Home Interiors .......................... 47
Office Building and Hospital ................. 61
C. W. Dickey, Architect

The Knickerbocker Theater Disaster ............ 67
Ross Wilton Edmiston
(Photos by the Author)

Making the Architect Say "Use It" .......... 75
F. S. Lawrence

Co-operation Between Architects and Contractors 80
F. E. Davidson, A. I. A.

How May We Stabilize Business for 1922? .... 85
J. W. Fricke

Spray Painting ................................ 90
Ray W. Tripp

Progress in Sanitation ....................... 93
Arthur J. Phillips

Medium Cost Homes ......................... 97

Finishing Interior Wood Trim ............... 103
A. H. Burt

Editorial ................................... 106

With the Architects ....................... 109

With the Engineers ....................... 113

The Contractor ............................. 116

Published Monthly by
The Architect and Engineer, Inc.
626-27 Foxcroft Building, San Francisco

W. J. L. Kierulff Frederick W. Jones L. B. Penhorwood
President Vice-President Secretary
DINING ROOM, HOUSE OF THE LATE MR. FRANK PINLEY, PEBBLE BEACH, CAL.
ARCHITECTURAL thinking may be rated in a progressive scale of effectiveness according to the number of architectural elements simultaneously embraced. There are designers with minds of a primitive and rudimentary type which conceive a building as a front facade. The habit of including side facades in the same conception marks a step in advance. Next in order follows the rear facade. And after these, the interiors. This does not mean that side facades are more important than front ones, rear facades than side ones, and so on (although such often happens to be the case after an architect has lavished a solicitous ineptitude on the front). It is rather that a conception is comprehensive in proportion as it neglects fewer of the inter-related elements of a problem. The last thing ordinarily to be considered is the interiors; which is to say that there are relatively few designers equipped to grasp a house as a whole organism.

The conception of interiors themselves proceeds along a line of progression somewhat analogous. There are designers who never get beyond the idea of a room as a series of one, two, three, or four facades. Above that comes a realization of the “solidity,” or volume, of a room. And the last in the scale is a feeling for the hangings and furniture.

“Facade designing,” is as unsatisfactory a procedure in the designing of a room as of an exterior, but one much more difficult to transcend. There is no lack of designers who appreciate that the effect of a building is something very different from any of its elevational facades, and that its actual convex mass, or bulk, is a quality at once more important and more elusive. The one who appreciates that analogous conditions are met in the concave design of interiors is more of a rarity. In a room displaying any real distinction of design the actual air space enclosed assumes a real mass, or bulk, as it were. No room which fails to possess this quality to some degree can be in any degree satisfying. Yet the ability to control such effects is one of the most unusual to be encountered. One must possess a certain instinctive ability to visualize the effect of drawings in execution;
the most careful consideration of the drawings themselves constitutes but a partial and sometimes illusory guide. This is much more true of interiors than of exteriors; and there are several readily understandable reasons why it should be so. For instance, one looks at a building, when contemplating it as a whole, with all its parts receding and in view; whereas a part of every interior lies behind one and the sides gradually fade away at the edges of the field of vision. This makes a profound difference in the effect of the design, along with the related fact that the spectator is nearer to the objects viewed, and that every movement of the head therefore produces a greater alteration in the subject viewed. These same considerations apply to courts; and it will be noted that, along with thoroughly successful interiors, successful courts of small or moderate dimensions are more rare than good exteriors.

The one consideration which places the open court in the exterior class, and makes its effect more readily calculable than that of the interior, is the analogous out-door lighting. Lighting, in fact, is one of the most elusive elements affecting interior design. Exterior lighting—day lighting, at least—is uniform in character within fairly narrow limits, and hence comparatively easy to visualize. But light may be introduced into a room in a variety of fashions, whose effects will be widely different; and, without considerable experience and above all a truly imaginative vision, difficult to foresee. The above mentioned effect of reality of the volume of a room is to a large degree the result of successful lighting, that is to say, the correct

LIVING ROOM, HOUSE OF THE LATE MR. FRANK PIXLEY, PEBBLE BEACH, CAL.
amount of light introduced at the right points. One of the gravest faults of our contemporary ordinary domestic interiors, one particularly responsible for their prevalent lack of distinction and dignity, is the lowness of window heads. A transom over a window, introducing the light at a higher level, will frequently make an enormous difference in the aspect of a room. Clerestory lighting is a motive of great beauty, almost completely neglected in contemporary residence work, even where possible under the conditions of plan and section.

The last element of interior design entertained by the average designer—an element all too frequently entirely overlooked—is the furnishing. Yet it is a commonplace of experience that one and the same architectural setting may be made or ruined by the furnishing alone. As a matter of fact, the design of a room can not be intelligently conceived except in view of what is to go into it. To appreciate this truth one has but to imagine the dining room of the Cook house, illustrated on page 50, furnished with the lavish Oriental splendor of the Pixley house (frontispiece and pages 48 and 49); or the elaborate wood architecture of the Pixley house treated with the calculated austerity of the rooms which Mr. Hobart has planned for the Cravens house (page 53). Such incongruities would be grotesque to any sensitive person; and the idea serves to emphasize the actually existing harmony which pervades these rooms, from their fixed to their smallest movable parts. Yet such misfits, in principle, are occurring daily in houses built by supposedly sensitive architects.

I. F. M.
DINING ROOM, HOUSE FOR MR. GEORGE T. COOK, PEBBLE BEACH, CAL.  PIERPONT & WALTER S. DAVIS, ARCHITECTS
LIVING ROOM, HOUSE FOR MR. GEORGE T. COOK, PEBBLE BEACH, CAL.  PIERPONT & WALTER S. DAVIS, ARCHITECTS
DINING ROOM

LIVING ROOM, HOUSE FOR MR. E. H. COX, PEBBLE BEACH, CAL.
Chas. F. Cobledick, Architect
LIVING ROOM, HOUSE FOR MR. E. H. COX, PEBBLE BEACH, CAL.
Chas. F. Cobbedick, Architect

LIVING ROOM, HOUSE FOR MR. JOHN S. CRAVENS, PEBBLE BEACH, CAL.
Lewis P. Hobart, Architect
BED ROOM, HOUSE FOR MR. JOHN S. CRAVENS, PEBBLE BEACH, CAL.
Lewis P. Hobart, Architect
DINING ROOM, HOUSE FOR MR. CHARLES F. DILLMAN, PEBBLE BEACH, CAL.
Lewis P. Hobart, Architect
LIVING ROOM, HOUSE FOR MR. S. W. FORSMAN, PEBBLE BEACH, CAL. S. W. FORSMAN, ARCHITECT
DINING ROOM FIREPLACE, HOUSE FOR MR. A. K. MACOMBER, PEBBLE BEACH, CAL. LEWIS P. HOBART, ARCHITECT
TEA ROOM, DEL MONTE LODGE, PEBBLE BEACH, CAL.
LEWIS P. HOBART, ARCHITECT
Office Building and Hospital

SOME of the recent work of Mr. C. W. Dickey of Oakland is shown in the accompanying perspectives and studies of an office building for the Pacific Gas & Electric Company, Oakland, and a large hospital in Honolulu for the Queen's Hospital Association.

The design for the new Queen's hospital is a simple and dignified interpretation of the Spanish Renaissance style of architecture, with broad lanais suitable to the Honolulu climate. Bright colored awnings will be used as an important feature of the design. They will be hand painted and treated by a fireproofing process. A raised terrace across the front of the main building will give it a fine setting and at the same time afford an easy approach for automobiles and ambulances. The main entrance is through a central porte cocher with auxiliary entrances at the ends of the new building which will be 220 feet long and four stories high. The old wooden porches are to be removed from the present Pauahi wing and replaced with reinforced concrete porches in keeping with the new building.

The exterior will be finished in light colored cement stucco with touches of red tile on the tops of the walls. The sashes and iron railings will be finished in dull green.

The plans for the new building have been worked out by the architect, Mr. C. W. Dickey, collaborating with Dr. R. G. Brodrick, one of the best hospital experts in the United States. Dr. Brodrick's method of planning is different from most experts. He places himself in the position of the occupants of the building and in imagination actually lives every operation and arranges the rooms and the conveniences to give the maximum efficiency and economy. No detail of arrangement or construction is too small for his careful consideration. The result will doubtless be a hospital of which all Honolulu may well be proud.

Among the general features of the hospital that will make it strictly modern are the following: All cases, refrigerators, etc., will be built in flush with the walls. Floors in general will be of cement covered with light grey linoleum, special floors such as operating rooms, baths, toilets, utility, treatment, and other rooms where water is used, being of tile. In the operating room the floor and walls to a height of five feet will be of light grey tile. The door frames, casings and much of the trim will be of enamelled steel. The doors will be of birch stained to a dark mahogany color and built of glass in the upper half. Double acting doors will be fitted with cork kick-plates let in flush with the surface of the door. A projecting, rounded base will be provided in all rooms to keep the furniture away from the walls. The walls in general will be of painted hard wall plaster.

There will be a ventilating system to exhaust the air from operating rooms, utility rooms, toilets, diet kitchens, and other places where odors originate.

* * *

The new office building for the Pacific Gas & Electric Company to be erected at the southwest corner of Seventeenth and Clay streets, Oakland, opposite the American Theater, will be an imposing structure. It will be a strictly fireproof high class office building with granite base and walls of flame colored brick and terra cotta and will be occupied in its entirety by the Pacific Gas & Electric Company.

The first story windows and doors will be of copper. At night a most unique and original lighting effect will be seen which has been devised by Mr. Romaine Myers, electrical engineer, and will consist of a series of sunbursts over the arched openings in the eighth story. These are produced by special refractors mounted in the terra cotta medallions.
ETHEL MOORE MEMORIAL, CHILDREN'S BUILDING, OAKLAND, CAL. CONSTRUCTION DEPARTMENT, OAKLAND PUBLIC SCHOOLS.
Marston Campbell, Chief of Construction; C. W. Dickey, Supervising Architect.
ACCEPTED DESIGN, BUILDING FOR PACIFIC GAS AND ELECTRIC COMPANY, OAKLAND, CAL.  C. W. Dickey, Architect; T. Ronneberg, Engineer
STUDY FOR BUILDING FOR PACIFIC GAS AND ELECTRIC COMPANY, OAKLAND, CAL.

VESTIBULE, BUILDING FOR PACIFIC GAS AND ELECTRIC COMPANY, OAKLAND, CAL.
C. W. Dickey, Architect
A Home Without Walls

"A spacious and unique house, without any walls or doors," is described in Popular Mechanics, which says:

This wall-less house is no makeshift dwelling, but substantially and artistically built according to the special design of the mother of the large family, who felt that all concerned would live more natural and healthful lives if unprotected by walls and artificial heat. The home consists essentially of a long concrete floor protected by a roof of corresponding shape and size, supported by Corinthian pillars of concrete, nearly 18 feet high. The roof is shaped like a turtleback and is pierced by two large circular skylights, set with transparent glass. These lights are particularly useful when rain or wind requires the letting down of canvas curtains on one or more sides of the house.

The floor is of concrete, laid over a network of hollow tile which lies only a short distance below the surface. This hollow tile is connected to a hot-air furnace located in a basement occupying a portion of the area beneath the house. The passage of air through the hollow tile serves to keep the floor warm, and so supplies heat.

The home is, in effect, one large veranda. While there are no partitions, there has been constructed at one side, midway between the ends, a series of booths or recesses, two tiers high, with openings at the front, across which hang heavy curtains. These are the dressing rooms for the entire family, and here are dressers, mirrors, and other necessary conveniences for making one's toilet. Only one of these compartments has four walls and a door. This is the bathroom. Stairs lead to the second tier of dressing rooms, along the front of which runs a picturesque balcony. The entire family sleeps on divans or couches, which constitute the principal articles of furniture at one end of the house, which end, in the daytime, might be compared to the reception hall or living room.

A large high backed settee at the opposite end of the house is another important piece of furnishing. The back of this settee is divided into spacious cupboards, where dishes and a small electric stove are to be found. The end of the structure comprising the dressing rooms, next to the settee, is fixed with sinks, and they, together with the cupboards, just referred to, constitute all there is of a kitchen.

A crude fireplace has been dug out in the rocky side of the hill, only a few feet from the end of the wall-less house, and here, amid the shelter of tall trees and shrubbery, the family often gather on cool evenings. Another retreat, popular with all the family, is a cave in the hillside, protected by a heavy door, where the family library and those articles which need protection from the weather are housed. All furniture used is finished to withstand a degree of exposure.

Editor's Note:—The house in question was designed by a San Francisco architect, whose supervision stopped after the colonade was completed. The plans were then so altered that architecturally it is considered a sorry mess, and occasionally termed "The Doughnut House." It is located in the Berkeley Hills.

* * *

How to Make Men Work

If there is any man in the country who has demonstrated his ability to get men to work better than Charles M. Schwab we have yet to hear his name. Mr. Schwab's secret is a very simple one. He packs it all into this paragraph:

"In my wide association in life, meeting with many and great men of various parts of the world, I have yet to find the man, however great or exalted his station, who did not do better work and put forth greater effort under a spirit of approval than he would ever do under a spirit of criticism."

* * *

Delegates to National Convention

The next Institute convention will be held in Chicago, probably early in May. There will be no exhibition held in connection with it. The delegate representation will be as follows: A basic rate of two delegates for every Chapter plus one for every twenty members or fraction over fifteen.
Disasters of one kind or another are continually creeping into our lives, for they seem to surround us at all times, and have to some extent become recognized as common occurrences. Mercifully, through all these inevitable calamities there seems to be an unseen God who gives a warning in one way or another to those whose lives are endangered, and, happily, most escape. The precious two or three seconds of the whining sound of shells tells of danger, and enables the soldier to drop to earth, or the smell of smoke in a house heralds a fire before it is too late to get out; even the deadly rattler gives warning before it strikes. These are truly forerunners of great perils.

But when the concrete roof of one of the most popular theaters in Washington, D. C., collapsed without warning upon a pleasure-seeking audience from a seemingly cause of only an unusual snowfall, people stood aghast at the catastrophe, and exclaimed:

"How did the roof fall? Why did it collapse? It is only a new theater," and so on.

Phrases such as these greeted the ear of the writer as he, too, stood in front of the doomed theater on Saturday night, January 28, only an hour or two after the calamity, and wondered why it fell.

The plan of the Knickerbocker Theater shows a curved wall or the west wall about a hundred and fifty feet long on Columbia road, which intersects the Eighteenth-street wall obliquely. The main entrance is on Eighteenth street N. W., and one is ushered into a well-appointed corridor or lobby. Between the lobby and theater proper, and parallel to the Eighteenth-street wall, is a long wall extending to the roof. We shall for brevity call this the east wall. The stage is near the intersection of the Columbia road and Eighteenth street walls, and the balcony at the south wall. Encompassed within these four walls is the reinforced concrete roof, and supported by a main Truss T-11, which is about fifty-seven feet long, together with three other trusses fifty-five feet long, two trusses about forty feet in length, and secondary beams, all relying on two columns indirectly for support. Truss T-11 is carried by the west wall and the main Column C-2. The east wall carried three trusses, T-12, T-13 and T-14, each fifty-five feet long, and their western support being Truss T-11. Another truss parallel to Truss T-12 RESTED in this

---

*Mr. Edminson was formerly a practicing architect in San Francisco. His report on the Washington theater disaster was written especially for this magazine.
The much discussed column C-2, showing that part above the joint whose upper end rests on the floor. The greatest strain fell upon this column.

Truss T-1-2 up against the 18th St. wall. Note ventilating fan at left, which was carried down by collapse of the concrete roof.
same wall, and extended to the smaller of the two columns, Column C-3. Columns C-2 and C-3 were joined by a twelve-inch "I" beam B-41 twenty feet in length at the level of the roof. From Truss T-11, extending in a westerly direction, and normal to it, was a forty-foot truss which rested in the west wall. It is a lamentable fact that there were no principal ties from Column C-2 south or west, and none to the west of Column C-3. Such was the condition of the trusses and beams carrying the reinforced concrete roof.

Many theories have been advanced as to the cause of the collapse. Among these might be stated that of the Columbia road wall becoming separated from its adjoining walls, permitting the bearing points of beams to loosen, and in particular that of the plate under Beam B-21, for, when Beam B-21 fell it caused Truss T-12 to become unseated, which also upset Truss T-11. The main Column C-2 was found to be not plumb, or if it was plumb when erected it became tilted when Truss T-11 was bolted to it. Another surmised and very probable statement is the weakness of the concrete slab; being too light to carry the loads, especially at the inflection points. The trusses and columns lacked that prime requisite in engineering practice to provide gusset plates and stiffeners where needed. Last, but not to be overlooked, were the vibrations caused by heavy trucking, and numerous street cars both on Columbia road and Eighteenth street N. W.
Intersection of Columbia Road wall and south wall. On the left, column C-2 and that part above the joint broken off. Here is an excellent presentation of what came down on the heads of the spectators. The concrete roof is only three inches thick.

Showing truss T-12 against the 18th Street wall. Note terra cotta above ceiling line upon which truss rested.
No one seems to know just when the cracks occurred in the west wall, one at the junction of this wall with the proscenium wall, the other at the intersection with the south wall, together with a few noticeable ones in the curved wall itself. It is certain that if any occurred prior to the collapse they would have been seen and reported, save those which had their origin between the ceiling and the roof, a distance of about six feet. It is now probable that the cracks were made at the time the roof fell, which, with its great weight and formidable shock, forced the wall out of plumb, leaving a gap of two inches at the proscenium wall, and five inches out of line at the top of the wall. This wall was also further weakened by the fact that no tie iron existed at the intersections.

With reference to the columns, especially Column C-2, much might be said. Column C-3 extended up to and through the ceiling to the roof. Column C-2, unlike Column C-3, only extended to the ceiling line where Truss T-11 had its southern end supported. From the bottom chord of Truss T-11 directly over Column C-2 were two three-inch by four-inch angle iron struts about six feet long, and supporting two or three roof beams.

As before mentioned, Column C-2 was out of plumb, and this has been verified at the ruins. It was noticed that the plaster on the north side at the top is two inches thick, and half an inch at the balcony level, whereas it is the reverse on the side opposite. This was more than likely done with a plumb by the plasterer to give it the appearance of being vertical. Moreover, the columns were not continuous, but were jointed at the balcony, and with regard to Column C-2, which carried the greater part of the roof load, the joint was poorly made. Here the effect of the tilt was plainly seen in the joint, tight and snug on the south side, and leaving a wide gap on the other side. It is without exaggeration to say that these two long and attenuated eight-inch “H” section columns nearly forty feet high supported about two-thirds of the roof’s dead load, or seventy-five to eighty tons dead weight, not including the snow load. This extra loading presumably increased the weight twenty pounds per square foot, or even more, during the recent storm.

The concrete roof, from specimens picked up, has been found to vary in thickness from two and a half inches to three and a half inches. Within these limits the meshing was placed to reinforce the concrete. In order to pour this roof the trusses and beams were floored over directly upon the upper flanges of the supporting compression members, and the meshing, consisting of three-sixteenth inch and eighth-inch wires, presumably made secure about three-eighths of an inch from the boards. The three-sixteenths inch wires were spaced three inches apart and normal to the east wall, while parallel to this wall were eight-inch wires twelve inches apart and welded to the others. In mechanics of materials we know that the stress is directly proportional to its distance from the neutral axis, an imaginary line running through the center of a homogeneous concrete slab or other material, and it is advantageous to have the reinforcing mesh as far below this axis as possible. Yet there also must be a goodly coating of concrete below the mesh for protection. However, it has been shown through poor workmanship that this meshing was carelessly laid and no regard shown in the pouring of the green concrete over it, thereby instead of having the mesh at three-eighths of an inch from the boards it was even up as high as the neutral axis—a plane of no stress.
Other forces than those mentioned played upon this slab, and which were not taken care of, namely, the tensional forces above the neutral axis near the trusses and beams, which were about ten feet apart. Where the mesh is in tension below the neutral axis midway between supports it becomes in compression as it nears the trusses and beams, and changes at the inflection points. No counter-reinforcing mesh was inserted over the trusses and beams to take care of these opposite forces. This, to my mind, was one of the weak points of the roof, especially if the concrete at this place happened to be two and a half inches thick.

As this heavy roof was laid directly on top of the upper flange, or for simplicity, a single compression member, it brought to bear other forces not taken care of in the truss itself. That is, as an example, between the panel points of this upper member a large force was acting tending to throw this part in tension in order to hold the roof in its place. If the upper chord was designed to take its own compressional forces together with the tensional forces set up by the weight of the concrete it would have been well and good, but such was not the case.

If, however, steel purlins designed to carry the weight of the reinforced concrete were placed at the panel points of the trusses, the weight would have been placed where it could be taken care of. Such was also not the case.

Another serious fault with the construction of the roof was at the walls. The mesh was laid directly on top of the terra-cotta wall with no ties, and its bearing on this wall was but three inches. We can then well judge that this had an ill effect upon the wall through continual expansion and contraction. Furthermore, directly at the intersection of the west and north walls the same method of placing the concrete was followed. Here was a very weak spot; between Beams B-21 and B-22, increased perceptibly by the fact that the reinforcing came to both walls on the slant. To make matters worse, this place fostered a calm where the snow greatly increased the danger of rupture due to no bond between wall or roof.

Throughout this network of trusses, beams, and columns, no gusset plates were used to strengthen the structure as a unit. Bolts were used, where in such an important structure as this field driven rivets should have been insisted upon. Not only were bolts used, but in number there were less of them than the required number of field rivets, whereas there should have been a greater number of bolts to insure a sound job. For instance, Beams B-19e and B-22 were bolted to Truss T-12 with two through bolts on each side of beam. Another instance existed at Column C-3, where Beam B-41 was bolted to it. Beam B-41 rested on and was bolted to the top flange of a twelve-inch channel. The lower flange of this channel rested upon and was bolted to an off-set in Column C-3. No through bolts were in the web of the channel to bind it to the column, and as B-41 pulled away from its bearing here there were no plates to hold it in place.

The ceiling of the theater was suspended by iron straps from the roof beams, trusses, and also at various points along the center line of the reinforced concrete roofing which, of course, greatly weakened this already overtaxed slab. Not only this, but to gain an anchorage for the straps the concrete was cut away from the meshing to secure the straps to it.

"Did Column C-2 give way first, or that of the roof slab at the intersection of the west and north walls?" This seems to be the debated
question. Both are logical places of rupture. However, if the slab gave way first, the column, due to its extreme length and weakness, followed almost immediately, and snapped at the joint. As it fell toward the south, there being no tie on this side to hold it in place, it jerked the main truss from its bearing on the west wall.

As the larger of the two columns fell it threw the smaller one out of balance. Beam B-41 attached to it, caused Truss T-16 to be dislodged from the east wall, and in collapsing the roof was also forced towards the south. The balcony being suspended from the trusses and beams, fell at the moment of collapse, aided by the roof, which sheared the balcony from its east abutment. The fall was quicker than the eye could follow, and those who went there for pleasure found themselves in the grip of the worst calamity in many a day. There was no warning, for it was even worse than the Iroquois Theater fire of nearly twenty years ago.

* * *

What An Ounce of Gold Buys in Labor

One ounce of gold buys 17.22 hours of labor in the United States, 50.16 hours in Great Britain, 95.50 hours in Japan, 117.31 hours in France, and 201.66 hours in Germany. These figures were given recently by Mr. C. J. Hannon, member of the British Parliament, quoting statistics before the National Union of Manufacturers in Birmingham.

The figures are interesting for purposes of comparison, especially by the worker in the United States. He must know that he comes, indirectly at least, into competition with the workers in the countries named, and that those countries are competitors of the United States in the world’s markets. It should not be difficult for him to realize that if we are to meet that competition successfully, and thus to his own advantage, we must in some way make our ounce of gold paid for 17.22 hours of his labor equal the ounce of gold paid for the much greater number of hours of labor in the countries named.

Our worker does not wish to give more hours for the ounce, and we are not saying that he should do so. Then he must give something that will be a practical equivalent of more hours until the total of return from our ounce equals the total of return from the foreign paid ounce.

He can make his hours more productive. He can become more efficient. He can co-operate more effectually not only with his fellow workers, but with his employers. We do not know of any other way in which we can make our ounce of gold equal in labor return with the ounce that will give us our greatest competition, and we must equal this if we are to sell our goods in the only market that offers an outlet for our surplusses.

* * *

Home Furnishing an Art

“HOME furnishing is an art and a science and not a matter of feeling or taste, though both are employed,” says an excellent little booklet recently sent out by a well known furniture manufacturing concern. “It is the combined effort of all the arts requiring years of study, research and serious thought. Objects of beauty and artistic merit, well arranged, are of the greatest influence for good that can be exerted over all people, especially children.”
ARCHITECTURE
and the
CHURCH

THE BROADWAY TABERNACLE
NEW YORK CITY
Barney & Chapman
Architects

Copyright 1921, by National Terra Cotta Society
Drawing by Hugh Ferris

FROM the ancient days of the temple builders, and on through the Christian era, architecture has expressed the highest aspirations of the Church. And, through the Church, architecture has been canonized as the greatest of the arts, for the Church has always offered to the architect his finest opportunities.

The great Church builders of the middle ages had at their disposal unlimited time, and the resources of artist-artisans who spent lifetimes upon the intricate carving of details.

The architect of today, confronted by the complex requirements and limitations of time and labor available for his work, turns to the material which is most available, most adaptable, and expressive of the full character of his envisioned building.

For virtually all his problems the architect of today finds a stimulating and practical answer in Terra Cotta.

In the advertising pages of The Literary Digest, National Terra Cotta Society is telling the reading public something about the responsibilities and achievements of the architect, and something, too, about the advantages of Terra Cotta. These Literary Digest advertisements have attracted unusually wide attention, and progressive architects are keenly following them.

NATIONAL TERRA COTTA SOCIETY is a bureau of service and information. Its publications cover not only the technical and structural use of the material but show, as well, examples of its application to buildings of various types.

Brochures of specific value, as indicated by their titles, will be sent to architects on request addressed to National Terra Cotta Society, 1 Madison Avenue, New York, N. Y.

The School
The Theatre
The Garage
The Store
The Bank

These brochures consist of a selection of illustrations, with text and comment, showing Terra Cotta buildings of the respective types.

Terra Cotta—Standard Construction

A valuable Technical Reference Work for Architects and Engineers.

Terra Cotta Defined

This new booklet, primarily intended to inform the layman, will nevertheless prove interesting to architects who like to review buildings the country over.

One of a series of strong advertisements of pronounced cumulative value, which conveys at a glance the thought of architectural possibilities in a church of the first rank through use of the medium advertised. The illustration is from a drawing by an artist of recognized worth in architectural circles. Had the drawing been poor the inference would be one of ignorance in possible artistic collaboration by the manufacturer.
SOME months ago I received from the head of a well known architect's office a statement of concrete fact about architects and salesmen. This was in the form of actual data from a representative architectural office showing how many calls per day were received from material men desiring to introduce or solicit use of their products and just what it all amounted to in influencing the architect's action.

The answer was illuminating.

He stated that he had kept a careful record and that the result of a year's tabulation indicated an average of thirty such calls per working day, or from eight to nine thousand per year, with a consumption of his time averaging three hours daily. He added that he made it a point to see every caller who had anything new to present, with the view that nothing might escape the knowledge of the office in the way of new or valuable developments in materials and equipment. This allowance of time was considered a paying investment as it yielded many resources for better results in the work that might otherwise have escaped knowledge. "But," he added, "I give you my word that as for the impressions conveyed by the line of talk put up, I could count upon the fingers of one hand the men whose presentation of their subject carried any weight and left me with any desire to see them again. If we wanted further information, we preferred getting at it in some other way than by calling salesmen back again for further consultation, if this could be avoided."

This statement is significant because it preceeded from an office willing daily to set apart two or three hours of an expensive man's time to keep itself in receptive touch with the material market.

Now what is the factor which bulks chiefly in this problem with the architect?

The answer to this lies in the one point which distinguishes the psychology of the architect from that of the average lay customer.

However successful the architect may be in the direction and control of the practical business operations associated with his work, his very choice of architecture as a profession shows him to be, at heart, one whose primary interest inclines toward activity in the terms of business or industrial activity. He is at bottom an artist who wants to think and act as an artist should, but who is forced by the manifold requirements of his profession to think and act as a business man should.

Although this fact is generally appreciated, yet there is no very prevalent effort to select salesmen with the particular aptitude for meeting this psychological factor. Let it be said at once that there is nothing mysterious or occult in the problem. It is simply that the architect's primary interest lying in the sphere of aesthetics, an intelligent comprehension of the mental processes which attend the production of results therein is essential to that rapport between architect and manufacturer which constitutes a fruitful working basis.

It is surprising that so many executives fail to distinguish this necessity in their selection of men for contact work with the architectural profession. Men splendidly equipped for presenting the merits of a product or service to the average man of business and "putting it over" with him against all opposition, are sent against the architect ("against" is quite the right word)

*Executive Secretary, National Terra Cotta Society, in Advertising and Selling.
and expected to accomplish with him an equal success by the same qualities of personal make-up and persuasive method.

The result generally is to arouse that subconscious resistance which every artist will exhibit if he senses an attempt to force his mental processes in the solution of his problem. It makes no difference whether this proceeds from an unintelligent view upon the salesman's part of the architect's particular problem, through his deficiency of education or taste, or is exerted deliberately under an adequate educational equipment in this direction. With the lay customer who, like the manager is apt to be a direct-thinking, hard-hitting business man, the persistent aggressive spirit which evinces the salesman's determination to "put it over" is, if it be done courteously, apt to arouse a sympathetic disposition through recognition of the very qualities to which the business man owes his own success. With the architect we are dealing with quite a different psychological factor—the groping of a fundamental artistic instinct for terms of expression in something that is to be a work of creative art peculiarly and personally his, and he will not view tolerantly any attempt to force the processes of reasoning which affect any part of it, from sand or gravel to gold leaf or fresco. (Possibly he has enough agony of spirit in this direction with the average client.)

A highly gratifying experience of some fifteen years in selling the architect, however, prior to the war (which I do not believe has changed his psychology) convinces me that with all his admittedly human failings he is a pretty reasonable fellow and responsive to a marked degree when rightly approached. It goes without saying that educational fitness for the intelligent discussion of architectural problems is, of course, a prime necessity in this when the product at all affects design. In the writer's observation it does not necessitate even for this class of materials that the salesman be a trained designer, valuable as that asset may be. The point merely is that where the salesman, whatever his product, will endeavor to fit himself to discuss with reasonable intelligence and helpful suggestiveness any question in use of materials generally from the standpoint of a broadly cultured knowledge, he is fairly well equipped for the footing which will make him a personally welcome visitor and an effective representative of his business. This is true whether his product is a decorative one or only that unlovely feature of necessary utility which adorns every bath room.

Whatever it is the salesman must be prepared to be a good sport. Perhaps, it may be admitted, an unusually good sport. He must, in fact, be quite content to all outward appearances to forego having his material selected where such adverse decision will help the success of the architect's project, if this clearly calls for some other material more appropriate for the particular result. And if he has the daring to assist the architect's knowledge of such other medium where this knowledge does not exist, he may be sure that the order will come back to him another day in another instance, perhaps without solicitation. I well recall an instance of this in my own experience when at a later date the result came home in successfully holding a large contract against the bitterest price-slashing competition. It was not the mere gratuity of a quid pro quo, but the fact that vigorous persuasive effort when made in this case was taken undiscounted and heartily backed up in a battle with the owner who had to be persuaded that a fifty per cent higher price spelt success as against failure for his purpose.

Of course, this prestige rests also upon other factors than those just indicated. It requires that further indefinable something in personality
which commands immediate recognition of the fact that the salesman is of "the same class" as the man he is talking with. The salesman who enters and stands with his hat in his hand gets no further eventually than the man who forgets the due courtesy of laying his hat aside when he is once in. The average architect is a cultivated person with a keen appreciation of the social habits which distinguish his class, and it also goes without saying, has no use for the man who knocks his rival's product.

In closing, a word might well be said regarding the inter-dependence of advertising and personal sales effort. It is a matter of wonder that large sums should often be freely appropriated for the printed page, while the appraisal of necessity in the quality of follow up, results too frequently in a cheap form of personal service. The salesman is an integral part of the general advertising program and progressive manufacturers are coming more and more to realize that for architectural patronage, only high grade men are economical. Unfortunately there is another class so averse to any material expenditure in this line that it is turning to the expedient of concentrating only on the client and ignoring the architect with the view that demand for the product shall be forced on him.

It is unnecessary to point out how the psychological factor already alluded to in this connection will be encountered under this policy in greatly intensified degree. Granting that the architect after all is only human and likely to yield to his client's wishes, however grudgingly, there is no point in needlessly antagonizing him. With the growth of taste in architectural design evident everywhere throughout the country, it is clear that the trained architect will be more and more in demand as time goes on, his influence in the selection of materials more marked, and that no sales policy, building for a sure and permanent future, can afford to ignore this tendency.

* * *

Architect Points Out Primary Principles on Building for Earthquake Resistance

By SUMNER HUNT*

This paper is a plea to architects and building contractors to remember that in any country earthquakes are a possibility, and in some countries a practical certainty, and to consider the effect of earthquakes on the buildings they plan and erect.

Outside of the geologists, who look upon earthquakes as a more than ordinarily interesting phenomenon and not as a terrifying one, the American public, generally, including even architects and building contractors, in localities where earthquakes are prevalent, are prone to emulate the ostrich who hides his head in the sand to protect himself from danger, and refuse to admit the fact of such a thing as an earthquake.

It is time we, in California particularly, admit the probability of earthquakes and learn that properly built structures will withstand, without serious damage, earthquakes of as great severity as any that have occurred here in the recorded past.

For the purpose of this article, "Class A" buildings will be but lightly touched upon, as the evidence shows that either a steel frame, or a reinforced concrete frame, engineered according to generally accepted formulae, will withstand the severest shocks: the only weakness developed in buildings of this class being from poorly built filler walls and poorly secured applied facing material and ornamental features.

*President of Southern California Chapter, American Institute of Architects. Paper read at meeting of Chapter, Los Angeles, Feb. 8, 1922.
The simple device of using light reinforcing and good cement mortar in filler walls and ordinary care in tying in of applied facing material and ornamental features will make these buildings perfectly safe. Perhaps the ideally-earthquake-proof building is the well engineered monolithic reinforced concrete structure, in which the structural material forms the finished facing, without the application of a veneer material, but as this in street architecture is generally not sufficiently rich or decorative, the opportunity for its use does not often occur.

As to buildings other than "Class A," an almost sufficient formula for earthquake resistance would be the simple one of building well instead of poorly, using the age old understanding of what constitutes good work.

In masonry walls, for instance, it is always the walls built with poor mortar that crack or fall. A good story illustrating the soundness of the good work formula comes from a committee sent some years ago to Imperial Valley to investigate the results of an earthquake there. The committee noted a considerable number of complete wrecks of buildings, built of cement blocks for the outer walls, and also noted other buildings of apparently the same construction that showed little or no damage. Investigation brought out the fact that these buildings, the wrecked ones and the ones standing in good condition, were all built by the same contractor, but the buildings in good condition were built by the contractor for himself. The moral is obvious.

As to details of good construction for earthquake resistance, we will start with foundations. They should be deep enough and heavy enough to insure against unequal settlement and to give something to which to tie the superstructure. In all frame buildings bolts should be built into walls. The mud sills should be firmly bolted down and joist and studding thoroughly spiked to sills. There are many instances of frame buildings having been thrown off the foundations at corners with of course a resulting dropping of the frame which, in cases of poor framing in superstructures, caused bad wreckage.

In the case of the common forms of vertical wood underpinning, on detached piers the wood caps should be bolted to masonry and there should be sufficient lines of vertical diagonal bracing in two directions to insure the whole building moving as one mass, as the action of an earth-quake takes the form of pulling the foundations out from under the superstructure, and if the building is so built that this is not possible a great element of danger is eliminated.

If the common method of frame construction, that of building one story at a time, is used, the upper story should be thoroughly spiked to the story below, this again to prevent the lower story moving out from under the upper. The roof construction also should be well braced and tied to the story below.

The same amount of diagonal bracing and bridging and tying that a good builder puts in for wind bracing and general stiffening will insure the requisite stiffness to withstand an earthquake shock.

In brick construction, there should be more cement used in common brickwork than is customary. One should know that bricks are wet before using and that the brickwork is well bonded and that the cement goes into the mortar. As stated above, it is the poor masonry that goes to pieces in an earthquake shock.

More care should be taken to thoroughly anchor joists to brick walls. Some builders will fairly well anchor end joists and be careless about anchoring parallel joists, forgetting that the wall needs the bracing given
by the floor just as much as the floor needs building so it will not slip off the walls.

In the case of large roof spans, avoid the scissors type of truss! Be sure to get straight bottom cords to trusses and have them well bolted into walls. In the San Francisco earthquake there were some notable cases of power houses with high walls and long roof spans, with straight bottom cords, that withstood the shock splendidly. Any form of truss or roof that, under a shock, will develop a vibration of the main strut member has a tendency to push out the supporting wall.

The commonest visible evidence of damage from earthquake is in chimneys. Japan, where earthquakes are, one might say, an every-day occurrence, solves that problem largely by not building chimneys, but so much of the sentiment of home to the Anglo-Saxon is built around the fireplace that it is almost indispensable, and it is not easy to build a chimney high enough above adjoining roofs to insure draft and at the same time make it earthquake proof. If, however, we would build at least the end walls of our common chimneys 8" thick instead of 4" and build into these walls, at each corner, a 1/4" vertical iron rod with an occasional bond iron running entirely around the chimney and avoid the use of too much corbeling in the tops and use good cement mortar, we will have a chimney that will stand a stiff shock. Terra cotta fluelinings tend to stiffen the chimney and reduce the danger from fire, due to cracks in the main walls, caused by an earthquake.

More care should be taken to curtail the height of street facade fire walls and in tying walls back to roofs.

More care should be taken to avoid unnecessary projection in cornices and to thoroughly tie same into supporting walls and to thoroughly support and tie in all ornamental features.

I would discourage the use of common form of hollow tile walls and partitions, I mean the form in which the only bed for mortar is the end web of the tile. If this form is used it should be reinforced.

There should be a state law that would provide and enforce a checking of plans for masonry buildings in small towns where there are no building laws. It is an unquestionable fact that the damage from earthquakes is more pronounced in such towns than in the larger cities where building is done under the supervision of a competent building department.

It is probable that the shocks of June, 1920, in Los Angeles were very nearly as severe as those of May of the same year in Inglewood, yet the damage at Inglewood was out of all proportion greater, due undoubtedly to poorly built structures, which were built on the go-as-you-please basis by contractors who perhaps did not know what really constitutes good building.

The establishment of district offices where builders from adjoining small towns would go for building permits would hold down the cost of such state supervision to a sum which, considering the danger due to present careless methods, we could well afford to pay.

In conclusion, this article is not intended as a technical treatise on the details of earthquake resistant construction, but rather, while calling attention to some of the simpler principles of such construction, is more of an urgent plea to all architects and builders to impress upon themselves the fact that earthquakes are possible anywhere and probable in many localities and to ask them to take the subject seriously and to so build as to minimize the dangers resulting from earthquakes and to remember that a good simple formula for earthquake protection is BUILD WELL!
Co-operation Between Architects and Contractors*

By F. E. DAVIDSON, of Davidson & Weiss, Architects, Chicago

TWENTY years ago there was the most close and intimate relation between the architect and the contractor and the relative position of both interests toward building operations was clearly defined and accepted by the most worthy custom and the most amicable relations were generally maintained.

In matters of the past we can think broadly, even though we all think a bit too narrowly as to matters of the present, for in the present some times our own passions and prejudices and predilections get in the way of our thinking, and thinking thus broadly on matters of the past, the reasons for co-operative relationship between the architects and the builders are apparent.

It is only proper to admit that even those in highest authority have certain well defined duties towards those whom they may direct or oversee, and I am prepared to admit that in the profession of architecture there have been many instances of unreasonable demands, often based on ignorance of facts, on inconsistencies and other things that cause irritation on the part of the builder, and it is equally true that on the other hand builders have failed to realize that the architect must necessarily retain some of his aesthetic attitude toward his building for he must build with beauty and without a sense of beauty and the refinement that should accompany it he can never create a result that will be satisfactory to him or to those who may competently judge the building. This attitude is often misunderstood by the builder, who only sees what may be termed an ultra dilettante attitude toward the subject involved.

Architects Must Plan Well That Contractors May Build Well

Yet after all, only as architects plan well can the contractor build well. A structure well built must be one which has been anticipated in imagination and then by blueprint-integration even down to every detail.

It is then, and then only with true fidelity to what this can all be reduced by the contractor to terms of beams and brick and concrete.

Please do not understand me as doing any special pleading in behalf of the sins of the profession. True, many architects have surrendered their professional independence by accepting salaried positions in large contracting firms and permitting rubber stamp duplication of what for each job ought to be carefully thought out and original creative work.

Despite this, architecture as a profession has nevertheless remained the most complex and comprehensive profession in the world; and the most successful architect is a man who has devoted years to the study of his art, to the mastering of many branches of engineering involved, to the study of commercial law, to the problems of business administration, whereas the builder on the other hand is recognized as a business man and he is chiefly concerned with the business problems of construction and what he may know about law, what he may have learned about art, or any of the other multitudinous subjects which must be at the finger ends of every architect are only incidental to his work as a builder.

As society is organized it requires the architect and the builder to produce the finished structure. It requires team-play of the two interests for the best interests of each other, the owner and for the public good.

*Abstracts of an article in the American Contractor.
As I have earlier said, twenty years ago, in recognition of this situation, relations between the architect and contractor were most intimate and amicable.

But today, on the other hand, these pleasant relations have in many instances been strained to the breaking point, and it is a matter that contractors engaged in the business of building, and we, in the profession of architecture, should seriously consider, and if possible in a spirit of friendly co-operation endeavor to bring about better relations for the good of both, ever having in mind the best interests of the third party—the building public.

I do not deem it necessary to examine into the ramifications of present building methods, the insistencies of jurisdictional awards, the autocratic attitude of labor unions or to the two fires between which the architect stands and between which the builder also finds himself placed.

May I be permitted to say that the contracting element has shown a disposition to laxness in its allegiance to the architect and has in many cases allowed itself to become overshadowed by organized labor, by combines of material interests and other considerations directly affecting the cost of buildings.

**Co-operation Essential to Rehabilitation**

Contracting organizations as such have been accused of entering into agreements with organized labor and with material interests in an attempt to monopolize certain classes of work and thus secure to themselves profits greater than would be considered reasonable when the magnitude of the operation and the risk is considered. There has developed in many lines of contracting a theory that any method or any practice is legitimate and is to be approved if only it is successful, forgetting that principle of equity upon which the social structure of modern civilization is founded, that thou shalt treat thy neighbor as thyself. The Golden Rule has been revised to read, do others or they will do you first.

In order to rehabilitate the building industry it is necessary that every interest shall co-operate in the effort to do away with all existing evil practices, and to establish in their stead principles of fair dealing between all.

For a moment let us see what has been accomplished by co-operation between the architect and builder in times past. Need I refer to the co-operation between the architect and builder as evidenced in the preparation of standard forms of building contracts, the use of the quantity survey system, and the formation of the National Board for Jurisdictional Awards in the Building Industry? May not real co-operation be carried still farther?

One of the greatest problems confronting the building industry and one which has caused more grief and woe than any other question is labor's part in the industry. Collective bargaining between organized labor on the one hand and contractors' organizations on the other has not proven satisfactory to the public. The tendency always has been for contractors' organizations to slowly but surely recede and to in time grant to organized labor, not only greater wages, but to approve rules and conditions restricting and curtailing output, overlooking entirely the fact that the added cost of buildings must be paid for over and over again by all of the people in increased rentals for all time, and that there is a grave ethical doubt as to the right of any two parties to a labor controversy to make any agreement affecting wages and to fix working rules and conditions, binding the third party, the public, without the third party being
directly represented, and it is my suggestion that in all negotiations for collective bargaining between contractors’ organizations and labor unions that the third party should always be represented and should be a party to the agreements, and by reason of his professional training and point of view, the fact that he has no affiliation with organized labor, associations of contractors or material interests, and the further fact that he is continuously serving in a judicial capacity, I know of no one who may more properly be said to represent the public than the architect. . .

I am also convinced that there is a great field for co-operation of the architect and builder in connection with the education and training of craftsmen. Today in all centers there is a virtual dearth of young mechanics. For some reason our young men are not learning the trades and craftsmanship as such is undoubtedly dying out in America. One of the greatest problems now confronting the building industry in America is the recruiting of skilled mechanics in the various trades. There is today an actual scarcity of skilled mechanics in most trades. Does the building industry realize that the ranks of the building trades were largely depleted during the war, that a large percentage of those who were building mechanics in 1917 are now employes in industrial plants or have found other means of livelihood, and when it is remembered that union officials have in many cases refused to admit men to their ranks, and in other cases have placed unsurmountable obstacles in the way of affiliations, and having in mind that during the past few years that the apprentice system in vogue in the large industrial centers to a very great extent has become obsolete, where may the building industry look to recruit the men that must be secured should a general revival of construction work occur?

Today we all recognize that building labor is inefficient, but do we realize that labor is inefficient in direct proportion as it is untrained? The average inefficiency of labor being, as I estimate, less than 60 per cent, adds millions to the cost of building operations. Based on the statistics of the F. W. Dodge Company, contracts awarded during 1921 in twenty-seven northeastern states amounted to over $2,390,000,000.00.

For the work covered by this report the efficiency of labor estimated at 60 per cent caused an actual increase in the cost of construction so reported of approximately $400,000,000.00. In other words, the increased cost of construction due to labor's inefficiency, if available for housing, would have permitted the construction of at least 100,000 additional homes during the year of 1921 and in a very large measure relieved the present housing shortage.

Every experienced contractor knows that the young men are not learning the building trades. They know that the average age of building mechanics everywhere is in excess of 40 years, and I maintain that the biggest problem now confronting the building industry of America is recruiting the ranks of labor with skilled mechanics.

Why should not the architectural profession co-operate with the builders by interesting themselves in trade schools and in the training of apprentices? Certainly the work accomplished by the architects of Philadelphia in cooperating with the Building Trades Council of that city is sufficient proof of the great good that might be accomplished by a general movement of this kind.

Let both the builder and the architect interest themselves in the trade schools, let the architect teach the young apprentice not only how to read plans, but to assist him in visualizing the architect’s point of view.
May I repeat a story that I read the other day about an architect who visited a large stone yard and interviewed a number of workmen? The first workman was asked what he was doing. He replied, "Working for $10 a day"; the answer of the second workman to the same inquiry was "Carving this piece of stone." The third craftsman replied "Helping to build a cathedral." The vision of this third worker, a real craftsman, should be the vision of every apprentice and every workman in every craft—the vision that he is an important factor in the great building industry and that his part of the task is as important as that of anyone else and that a task well performed makes him a better craftsman, a better citizen, and adds something to the wealth of all.

Co-operation between the architect and the builder is today more necessary than ever. If the builder will but realize that his first interest lies in his close co-operation he may, in my humble opinion, in a very great measure overcome the menace of organization in labor, and standing shoulder to shoulder with the architect be able to dictate as they both should and not allow themselves and their clients to suffer by intimidation that insures in place of efficiency and reasonable building costs the most inefficient labor as well as an inflated wage scale. Of this there can be no question, as there is no question in any case where co-operation may reach its highest development, but both architects and builders must give and take, and each must, up to the very extent of his ability, meet the views of the other, only halting at a point that means poor results and harmful effects on the interests of clients.

The modern architect realizes that he must be a clear-sighted business man because if he is not he will find that he is losing in every discussion in which he engages with his contractor and builder, the very essence of whose success is the perfection of their business ability. It may not be inferred that this sharper training in commercial methods enables the builder to put over anything on the architect, but it must be assumed that if the architect, no matter how artistic his inclination may be, fails to have an equally thorough business acumen he will never be able to maintain his correct position in co-operation and will ultimately sink into contempt, as he will be regarded by every builder as an incompetent, as a dreamer, and a poor one to work with.

**When Contractors Invade Architect's Field**

This matter of co-operation between the architect and builder is a very simple every-day proposition and in its fundamental elements is no different from any other instance where co-operation is essential to the best development of any operation in which men are engaged.

I have often wondered to what extent the present apparent lack of co-operation between the architect and the builder may be charged to the now quite general requirement of the various states that the state shall control and regulate those calling themselves architects, and the tendency, all too apparent, for builders to disregard laws regulating the profession and to assume that they are a law unto themselves. The most responsible and best-known builders recognize their proper field of usefulness and rarely, if ever, trespass upon the work of the profession, but need I tell you of the thousands of cases where the contractor advises an owner that the services of an architect are a useless luxury and that he, the builder, can plan equally as well as any architect? I have no sympathy with those who conceive it to be the function of the builder to be also the designer, nor have I any sympathy with the suggestion made in some states that the state should license contractors. I can conceive of nothing
more disastrous to the building industry, to the business of builders, to our profession as architects, than to place the building industry under state control, as was sometime ago recommended in the state of New York when a proposal to create a state trade commission to regulate the building industry was defeated.

The profession of architecture is unalterably opposed to the architect who tries to build on the side and may I suggest that contractors just as unreservedly outlaw the builder who tries to play architect on the side. This is not a trade unionism doctrine. It is common, every-day horse sense.

Many builders, while they give lip service and hand applause to the recognition of the field of the architect, alone with the owner forget their Sunday profession by Monday practices in order to get the edge on a competitor. They talk about the architect being necessary only to himself. They tell the owner that they can provide all the plans needed to secure a building permit and to construct the building, and many times, I regret to say, that they induce the owner to fall for the "bunkum"—with what result? The owner who believes them is either a fool or a crook. He is either a man who knows nothing whatever about planning or building problems, or he is a man trying to get something for nothing, and right here will be seen the danger signal of trouble ahead.

Not knowing the builder's problem, the owner is not sympathetic to it. He has not either the indulgence or the instinct to be sympathetic with them and remember in these cases their appeal to the architect is cut off. An architect in his professional capacity is an owner's professional personality. He is the owner's mind in the building problem and without the architect as a go-between the builders and the owner, another profession, that of law, usually comes into the fight between them and both have only to show a black eye and the loss of litigation, and for what? Nothing! Remember, that with an experienced architect in charge of the work the usual questions affecting the contract, such as changes or additions ordered after the work is started, will be adjudicated by the architect and that in 999 times out of every 1,000 his findings will be fair to both builder and the owner. On the other hand, without the architect the lawyer will litigate for contractor and the owner and no matter who wins, both lose.

Let me summarize a few matters that in my opinion are proper subjects for the co-operative efforts of the architects and builders.

Why should not the scope of the work of the National Board of Jurisdictional Awards in the Building Industry be extended to cover the matter of the preparation of forms of agreements and working rules, wherever collective bargaining is the rule in the building industry? Why should not the board also be entrusted with the task of fixing the minimum wages for all the building trades in all localities of the United States? Why should not builders' associations be relieved from any and all duty in connection with the preparation of trade agreements and working rules? Why should not all these matters be referred to the national tribunal, the National Board for Jurisdictional Awards, whose organization might be changed so as to be composed of every important interest having to do with the building industry? Why should not this board set as a court of original jurisdiction as well as a court of last resort with power to decide any and all questions which may arise at any time and between organized labor and organized associations of contractors, or between two or more associations of contractors, or two or more unions?
IT SEEMS to me but a short while ago that I stood before the splendid assembly of the National School Supply Association and addressed you as members on a subject vital to us at that time. This short while, nevertheless, comprises a whole year, which has rushed into the ocean of time, faster, swifter, than the golden Feather River of California, which murmured to me as I whipped its onward stream hardly three fortnights ago. From its depths came that thrill which enraptures the very heart and fills with joyful gleam the eyes of a business man who has loftier ideals than those lashed only to an office desk overladen with the daily monotonous task of life. To be with you again this year gives me much pleasure.

We have come to this conference with the same end in view as last year, yet with better understanding and greater vision—I stand here this morning by an absolute decree. Our honorable business director, Mr. Vinson, with his staff associates, wrote me in a letter dated November 10th: “Without your knowledge and consent we placed you on the program for the first thing Wednesday morning to discuss the question of ‘Stabilization of Business for 1922.’ The program in hand asks for the discussion of this question from the standpoint of the jobber.” In placing me in the foreground for this discussion, Mr. Vinson must have been lured on by articles of Mr. Hinman, the noted editor and authority on business who on the 23rd of last month in one of your foremost Chicago papers informed the world that the business map of the greater part of California is white, Illinois shaded considerably, and some states solidly black. Be that as it may, as one who’s cradle stood in this great metropolis and railway center of the world, I have covered 2260 miles by nearest railway to be here to say,

“Not without thy wonderous story,  
Illinois, Illinois,  
Could be writ the nation’s Glory,  
Illinois, Illinois.”

The subject allotted to me is so deep and extensive that my paper and views can only be considered an incentive or stimulus for you to bring out of the golden shafts of your wisdom and experience valuable addenda by expression and discussion.

“How may we stabilize business for 1922?”

The year 1920 and the first half of 1921 with their many troubles might be likened to the days of Pharaoh with their many plagues. Everybody but especially the harassed business man, is looking anxiously ahead with the hope that a second “promised land flowing with milk and honey” may be discovered, a land abounding in “Manna” and without such modern “plagues” as price cutting, “buyers’ strikes,” fluctuating prices and zero profits.

Perchance a Moses is needed to lead the members of the National School Supply Association “out of the wilderness,” but as the speaker is neither a prophet nor the son of a prophet, he can hardly venture to assume that role. It can only be his province to try as best he may with his far from prophetic vision to give you a glimpse of this much-desired “promised land” with the stabilized “straight and narrow way” leading thereto.

An address before the members of the National School Supply Association, Chicago.
In seeking the key that may unlock the door leading to this "straight and narrow way," it must be remembered that such far-distant troubles as the famine in China, the "tobogganing" of the German mark or a strike in Great Britain may all have their influence on stabilizing business in America. With the coming of the steamship, the locomotive, the aeroplane, the telegraph, the world in its business relations has become, after all, a small place. Chicago by wireless is less than a half minute distant in time from London or Tokio.

The business depression or prosperity of any nation is quickly reflected elsewhere, and so the whole question of stabilization is interlocked with conditions affecting the world, the nation, all types of business and finally the individual. But whether the question of the stabilization of business be approached from the world or national viewpoint or from that of the organization of the individual, its gradual economic solution simmers down very largely to the two great C's—Confidence and Co-operation.

A Word on World Stabilization

All history shows that periods of business depression follow all wars and financial panics. Recall the wrecked business conditions following the Napoleonic wars, our own Civil War, and the panic of 1873. In these, and other cases that might be mentioned, stabilization came with renewed confidence and co-operation. But as the recent World War left a greater burden of death, of debt and of world, national, business and individual demoralization as its aftermath, so will the return of stabilized business conditions be a problem greater and in some way more difficult to solve, than those of past decades.

Consider our foreign exports alone. During the first eight months of 1921 our exports decreased nearly two and a quarter billions of dollars as compared with 1920. While the "slump" in prices accounts for some of this loss, by far the greater part was due to decreased buying power on the part of our foreign customers. And remember, too, that this steady decline in exports represents very largely manufactured goods.

A committee representing the Chamber of Commerce of the United States, after a recent tour of Europe to study business conditions, issued a report in which they say that upon a conservative estimate "the consumption of 300,000,000 people in Europe has been reduced to not over 30 per cent of what it was before the war." Certainly this loss of purchasing power has directly affected business in a world-wide way. It is not claimed that this world situation has directly affected the school supply, furniture or equipment business in the United States. It can hardly be questioned, however, but that some of our troubles are traceable thereto.

Without taking the time to discuss such questions as the international credit situation, the foreign debt, competitive armaments and others, it goes without saying that the sooner the nations learn the lessons of confidence and co-operation the sooner will the "scars of war" be forgotten and the sooner will world business be stabilized. The hope for success of the International Conference on Limitation of Armaments now in session in Washington will, if realized, go a long way not only toward assuring world peace, but to decrease national expenditures and debt and gradually to bring about a world stabilization of business. And all this will come to be if the nations only give heed to these noble words of President Harding in opening the conference:

"The United States welcomes you with unselfish hands. We harbor no fears; we have no sordid ends to serve; we suspect no enemy; we contemplate or apprehend
no conquest. Content with what we have, we seek nothing which is another's. We only wish to do with you that finer, nobler thing which no nation can do alone.

"We wish to sit with you at the table of international understanding and good will. In good conscience we are eager to meet you frankly, and invite and offer co-operation. The world demands a sober contemplation of the existing order and the realization that there can be no cure without sacrifice, not by one of us, but by all of us."

**National Problems in Brief**

With the beginning of the period of deflation and business depression in 1920, it seemed certain that business in general would not revive without at least three things: (1) Cheaper and more plentiful money; (2) a lowering and stabilization of prices, and (3) the restoration of confidence on the part of consumers. Throughout 1921, both in the school supply, furniture and equipment business, and in practically all other lines, business has revived as these conditions were brought about. Certainly money is now more plentiful in most sections and at lower interest rates. Prices of many commodities have been "cut to the bone." The confidence of the consumer is slowly returning.

It is much to be regretted, however, that the Congress has been so slow in passing remedial legislation, the uncertainty of the outcome of tax and tariff revision, of railroad legislation and of other proposed laws have, to take the most charitable view, retarded a general revival of business. Whatever may be your views or the speaker's as to the tariff or the income tax or the railroad funding bill or other moot questions, we can at least agree that they should, one and all, be settled at once so that business may know exactly what to expect. It seems but fair to say that business is reviving not because of Congressional action, but in spite of it. This at least is the case in California.

**A Lesson From the Golden State**

Perchance the speaker may have wearied you at times with his perfectly truthful eulogies of the wonders of California with her climate, her big trees, her Yosemite and numerous other attractions you know not of in the "benighted east." Today (before proceeding with the discussion of stabilization), he ventures to call your attention to the California way of supporting her schools. Doubtless you will note the connection with the main issue. The states have invested in school property, in dollars per child, all the way from $14.72 in Alabama to $148.30 in California.

Not content with this remarkable showing the voters of California on November 2, 1920, by a majority of more than 200,000, passed a constitutional amendment providing that hereafter the state shall contribute out of its treasury toward the support of the public schools an amount which shall be not less than $30 per pupil per year in average daily attendance in the elementary and high schools, and that the counties must raise in addition at least $30 per pupil in average daily attendance in the elementary schools and at least $60 per pupil in average daily attendance in the high schools.

Under this constitutional amendment state support for the elementary schools was increased approximately 50 per cent, while state support for high schools was increased fully 100 per cent. Beginning with July 1, 1921, California will give about seven millions of dollars yearly to her schools more than ever before.

This amendment equalizes educational opportunity in California. It established the principle that money for the schools "shall be raised where income is and distributed and expended where children are." It means throughout California better salaries for teachers, better school buildings, better equipment, better schools. The California plan is commended to
you not only as parents and citizens, but as an ideal step for any state to adopt in financing the schools.

The Lessons of 1920 and 1921

Looking backward through less than two short years, we can see, in the eloquent words of President Harding that "there can be no cure without sacrifice, not by one of us, but by all of us." When inflation ceased, prices "tumbled" and the "buyers' strike" was on, then sacrifice began in the business world, but not nearly "by all of us." And there has been the trouble and there is "the lesson of 1920 and 1921." Few of us at first saw the "handwriting on the wall." Few of us at first recognized the absolute fact that the prices of all manufactured products must be deflated along with wheat, sugar, flour and other necessities. Few at first, whether concerned with agriculture, manufacturing, labor, jobbing or transportation, took their losses promptly with prices and wages stabilized on the deflated basis. Too many waited for "John to do it."

Happily in time the business world more and more saw that, with decreased buying power on the part of the consumer, losses must be taken. As the "buyers' strike" grew, prices slowly "zig-zagged" downward. The more rapidly prices sought the new level, the more quickly confidence of the consumers was restored. If the sacrifice of profits could have been made promptly by "all of us," there could hardly have been any "lesson of 1920 and 1921." With the lesson before us so plain that "he who runs may read," it is clear that complete confidence may be restored and buying renewed only on a stabilized fair price basis. In this connection these words of President Harding in his inaugural message are well worth remembering: "A measuring rod of fair prices will satisfy the country and give us a business revival to end all depression and unemployment."

According to the program, the speaker was expected to discuss the question at issue from the jobbers' standpoint. From what has been said, it seems fairly clear that, if business is to be stabilized for 1922, the jobber, distributor, manufacturer, consumer, will all see the many problems involved "through the same glasses."

The consumer needs our wares and needs them badly. Restore his confidence and he buys. The manufacturer is willing to go ahead "full steam." But to dispose of his wares he must take into account not only his own over-head with reasonable profits, but take into account the viewpoints of both consumer and jobber. And the same with jobber and distributor. In other words, there should be no distinctive consumers' viewpoint, manufacturers' viewpoint, jobbers' viewpoint. Let us seek to look "through the same glasses," and reach a common viewpoint to the profit of all concerned.

The Two Great C's—Confidence and Co-operation

The business structure is built upon confidence and the cornerstone and foundation of confidence is co-operation. Here are the two great C's to take into account in seeking an answer to the question, "How may we stabilize business for 1922?"

Lack of confidence on the part of the consumers along with decreased buying power, led to the "buyers' strike." Lack of confidence on the part of some jobbers and distributors certainly had much to do with price cutting. Lack of confidence on the part of some manufacturers led to delay in stabilizing prices for 1921 with later partial demoralization of business.
Happily much of this, though not all, is ancient history. Remember, however, my brothers, that we may interpret the future much better by taking into account the mistakes of the past. Facing a distinctive buyers’ market with many buyers still waiting to be “shown,” they must be inspired with confidence not only in the quality of our wares, but in our prices, policy and service, and that can only be done on the basis of cooperation.

No patent cut-and-dried recipe for restoring confidence through cooperation may be given in its details, but again remember in the words of President Harding, “there can be no cure without sacrifice, not by one of us, but by all of us.” And remember, too, that we may not hope for steady buying on the part of the consumers unless we have their confidence, nor may we gain their confidence unless we ourselves face the coming year with a confidence based on a selling program worked out on a co-operative basis—with fair, stabilized, guaranteed prices as the cornerstone.

What of 1922?

Do not imagine from the analysis given that the speaker has anything but a feeling of optimism as to the outlook for 1922. Deflation through many bumps, jars and “zig-zags” has almost run its erratic course. Slowly “all of us” have learned, or almost learned, that something of sacrifice must be made not only for the general good, but for self as well.

The outlook for 1922 could not be brighter. With a complete standardization of guaranteed prices on a basis fair to manufacturer, jobber, distributor, consumer, the curve of sales is sure to move upward throughout 1922. The school building program of the nation is fully two years behind what it should be. The sale of school bonds during the greater part of 1921 marked a distinct gain over 1920. Cheaper money is reflected in an improved bond market at much lower rates of interest.

With interest rates lower and with a clamoring demand for new school buildings and equipment all the way from “The Hub” to the Golden Gate, it is safe to predict that school bond issues and special school building taxes will be much greater during 1922 than for 1921. All this means a constantly increasing demand for practically all lines in the school supply, furniture and equipment business. One warning, however, to manufacturer and jobber alike. We have faced one “buyers’ strike,” even now not entirely a thing of the past. None of us, whether manufacturer, jobber or distributor, care to see another, but see it we may unless we retain the confidence of consumers through fair prices, stabilized prices and one hundred per cent service all along the line from the factory to the school.

* * *

Baths and Bolshevism

A well-known Socialist is credited with having said that Bolshevism will never make much headway in this country because we have too many bathtubs.

That is only another way of saying that “cleanliness is next to Godliness.” There is something so incompatible between soap and water and evil that they are seldom found in close association.

External cleanliness is not always a sign that things are clean within any more than “company manners” are proof of domestic bliss in the solitude of the home after the visitors are gone.

Yet the reverse is almost always true. The clean heart demands a clean outside.—St. Louis Globe Democrat.
Spray Painting
By RAY W. TRIPP in Building Management

THE use of spray painting equipment operated by means of compressed air, although a comparatively new process of applying paints and other protective coatings, has been extended to a great many new fields during the last year or two. The most noteworthy are the interior decorating of office buildings, institutions, etc., and the interior as well as exterior work on houses and buildings of all descriptions.

Unusual demands placed on the paint industry during the recent war were really responsible for the further development of the first paint guns or air brushes, as they are sometimes called, which were used on large surfaces such as ships, war materials, factory interiors, and similar work. Since then, of course, the equipments, operating technic and especially the paint guns have been improved from time to time until today the outfits are perfected, as well as foolproof. At the present moment the most exacting finishing problems are solved through the use of spraying equipment.

Painting with compressed air and a paint gun requires no introduction to the building manager, master painter or general contractor as the practice is now widely extended. In this age of mechanically operated tools all who handle paints, either making, buying or applying, are familiar with the operation of the newest and most radical development in the science of painting—pneumatic spraying equipment, and the immense saving of labor through the use of the paint gun is self-evident.

Observation and experience on many thousands of satisfactory installations have disclosed interesting facts worth noting at this time. The air scheme of painting enables one operator to paint more square feet of surface than six or eight painters using hand brushes, and to secure finished surfaces which are superior to those painted with a brush. Where single coat work is desired a lighter or heavier coating can be obtained than is possible with a hand brush. Inaccessible surfaces that are difficult to reach with a brush are rapidly painted, as the paint gun may be quickly mounted on an all metal sectional extension pole whenever the operator wishes to paint a surface beyond his reach. Ceilings and walls up to about twelve feet in height may be painted without staging or staging is reduced at least 50 per cent on any job. Brush marks, skimped places and laps are entirely eliminated and the covering and wearing qualities of materials are increased. All paints are sprayed to equal advantage at the same consistency as for brush work. Material containers are air tight, which prevents the formation of paint skins, and makes it impossible for dirt to become mixed with the paint.

The next point to be considered is the type of equipment required for work such as the building manager has under his control. The standard equipment recommended and used on this work consists of a portable container of 5 or 10 gallon capacity, with control head for regulation of air and paint pressures, this head containing reducing valves, air and paint strainers, pet cocks and indicating gauges, a paint gun of suitable design, with two guns operated from one head, if desired, an all metal sectional extension pole, and air and material hose in lengths to meet all requirements. A portable compressor outfit, either gas engine or electric motor driven, with air storage tank, necessary gauges and safety valves will complete the outfit.
Realizing that there are certain little "touching up jobs" to be done almost daily in every large office building, one of the largest manufacturers of spraying devices has just perfected a smaller outfit for this class of work. This small outfit comprises the following: a paint gun attached to a one-pint aluminum container by means of quick opening adjustable clamps, suitable lengths of air hose and a small portable electrically driven compressor. The compressor is operated by such a small motor that it may be connected to an ordinary lighting socket, making painting problems as simple as cleaning ones are through the use of the vacuum cleaner.

Of course, the larger outfit mentioned above is absolutely necessary wherever large quantities of work are to be done at one time. The ideal installation usually calls for both outfits as the building manager of today has more than one building under his control and painting is a continuous performance from the beginning to the ending of each year.

**Catechism for Paint Users**

Anticipating questions which will arise in the reader's mind, these questions and answers have been arranged:

What is the loss of paint, using spray method?  
None, if handled according to operating instructions.

What is the covering capacity of the spray on large buildings?  
Minimum, 4,000 to 5,000 sq. ft. per 8 hour day; maximum, on large surfaces, 10,000 sq. ft. per 8 hour day.

Can sash and small trim be painted by this method, and is it advocated?  
By using a line board such work may be done, but not to advantage. One man with a gun on the main body of the building will keep two men busy with brushes on the sash and trim.

Can the woodwork in an office be coated?  
Yes, by using a line board and masking glass often found in partitions.

How much air pressure is necessary to operate gun at maximum capacity?  
For average work, 50 to 55 lbs. pressure.

Can the spray be regulated?  
Yes, it is possible to secure a round conical spray or a broad fishtail spray, and thickness of paint film may also be easily regulated.

What is the width of the spray?  
It corresponds to an 8 or 10 in. brush when the gun is held 6 ins. from surface to be coated.

How is it possible to handle different paints with the same equipment?  
By means of different air and material pressure, as well as adjustment of material control on gun.

How are cold water paints, bronze solutions and heavy lead paints kept in suspension?  
An air-operated agitating attachment is furnished for this purpose.

Will the spray gun clog?  
No, if material is properly strained and the gun cleaned after each day's work.

Is it possible to do outside painting on a windy day?  
Yes, by holding the gun somewhat closer to the work.

Is the use of pneumatic painting equipment advocated by paint manufacturers?
Yes, resolutions favoring the use of spray painting machines were adopted by the Paint Manufacturers' Association of the United States and approved by the board of directors of the National Varnish Manufacturers' Association.

Another question often asked is the following:

How has this method been received by the master painter, the manager and the journeyman painter?

The master painter has been impressed with the fact that the spray method of painting practically creates a new field for him, and another excellent reason is that it increases his volume of work, which means greater profits. The manager or owner welcomes the spray method, as it enables him to paint at a reasonable price, making his offices and buildings more desirable, whereas if the work had been figured on brush costs, the price would be prohibitive. The journeyman painter favors the equipment because his occupation has been made much less laborious than with brush work.

There is no doubt that many million dollars' worth of building failed to receive the customary coats of paint during the recent era of high prices of materials and labor. Much of this neglected work now demands immediate attention if the property is to be saved. New building, which we are sorely in need of, will soon be demanding its share of protective coatings. The field for this invaluable aid to modern building is surely extensive.

Pneumatic painting equipment has proved its value beyond a doubt and has earned a permanent place in up-to-date business practice. It is one of the most important agencies through which the wise and comprehending employer makes his employee's job a pleasant and healthful one, at the same time securing more and better work. Surely, every user of paint or finishing material owes it to himself fully to investigate the possibilities of spray method as applied to his particular work.

* * *

The Builders and the City

The picture once painted or the poem sung, it stands henceforth by itself; the artist can do no more for it. It must live or die without further help from him. But the city is never thus entirely separated from us, its builders. It remains tied to us by the invisible cord of nourishing passions. It grows with us or it dies with us. It is in a more real and personal sense a part of us, as we are of it. It becomes then the reflex of the lives and aspirations of the people who dwell in it. So that a city—its streets, its highways, its buildings, its public places, as well as its business and life—is an embodiment of ourselves. It is this living spirit that may hearten and inspire us; that may delight and enchant us, and that may also break and destroy us.

* * *

—Temple Scott.

The New American Architecture

Simplicity and truth are two outstanding features in the national type of American architecture which is noticeably developing under the urge of commercial and civic growth.

There is little ornament and not much attention to the ornate in this type of building. These modern American structures are just what they seem to be. They are imposing and impressive. Some of the best examples of this new American architecture are found in the commercial and public buildings of the Pacific Coast.
Progress in Sanitation*

By ARTHUR J. PHILLIPS

WITHIN comparatively few years marked progress has been made in modern sanitation. Today we enjoy refinements in the home bathroom and public toilet unheard of a generation ago.

The tiled-in bath may be cited as one of the most conspicuous of such advances. This type of fixture has not only added charm to the modern bathroom; it has, moreover, materially lessened the keeping of such rooms spotless. Not a few sanitarians and health authorities have investigated in connection with such baths, various types of wastes through which the used water may be completely discharged without any possibility of residue backing up into the tub when fresh, clean water is drawn for another bath, and have found that a waste, to be perfectly sanitary, should not permit any water in the tub to come in contact with any hidden pipes or connections from which might be dislodged soapy residue or possible disease germs from previous bathers, for dislodging such material would contaminate the supposedly clean water in the tub. Health authorities give full approval to those types of bath wastes which confine within the bathtub every drop of water during the bath and which permit rapid and complete discharge when the stopper is raised without any possibility of any of the discharged water or residue backing up into the tub at the next drawing.

This feature of bath waste cleanliness is especially important in hotel and apartment bathrooms, where every precaution should be taken to prevent any possible contagion. The same reasons applying to bath wastes are likewise applicable to basin wastes. The specification writer's attention to such important details makes the difference between a sanitary installation and an insanitary one. In one of the foremost commonwealths, the health department has been conducting a vigorous educational campaign on this very phase of domestic sanitation and it is extremely encouraging when such factors for improved sanitary conditions enlighten the public on ways and means to insure the better con-

A Dental Basin for cleansing the teeth and oral cavities

supply of water cleanses the basin. The basin is usually furnished with an open grate, which discharges the waste water as soon as it falls into the basin.

For public wash rooms, lavatories should be equipped with liquid soap dispensers, thus providing means for users to obtain a supply of soap untouched by other hands. Manufacturers can furnish on specifications such lavatories drilled specially so that a dispenser may be installed at the side of one of the faucet holes. Where such special drilling is not desired, the dispenser may be installed in the left-hand faucet hole and a double mixing faucet installed in the right-hand faucet hole. Unless it is absolutely necessary to conserve the water supply, it is advisable in public installations to equip wash basins with faucets that can be kept open, so that the users may wash in running water if desired. Where, however, water conservation is necessary, the self-closing faucet should be employed.

Another outstanding feature in modern sanitation has been the perfecting of the so-called "quiet" closet.

ditions which the industry is planning to make possible.

While on the subject of wash basins, it seems in order to mention the growing tendency to install in addition to a lavatory in private and other bathrooms, a small separate fixture for cleansing the teeth and oral cavities.

The sanitary advantages of the dental basin are too obvious to require further comment. Such a fixture should be considered indispensable for college dormitories and like structures, and its use, moreover, should be recommended in private bathrooms as well. Dental basins are usually small and compact, not exceeding 14 x 13" in dimensions, and are equipped with combination hot and cold supply fixtures discharging water through a gooseneck, a portion of which is diverted through a flushing rim inside of the basin, so that a copious supply of water cleanses the basin when these supply valves are open.

For public wash rooms, lavatories should be equipped with liquid soap dispensers, thus providing means for users to obtain a supply of soap untouched by other hands. Manufacturers can furnish on specifications such lavatories drilled specially so that a dispenser may be installed at the side of one of the faucet holes. Where such special drilling is not desired, the dispenser may be installed in the left-hand faucet hole and a double mixing faucet installed in the right-hand faucet hole. Unless it is absolutely necessary to conserve the water supply, it is advisable in public installations to equip wash basins with faucets that can be kept open, so that the users may wash in running water if desired. Where, however, water conservation is necessary, the self-closing faucet should be employed.

Another outstanding feature in modern sanitation has been the perfecting of the so-called "quiet" closet.
In this connection, caution may be necessary relative to the word "quiet." Quiet closet action is the desideratum of every closet maker; yet this should never be attained at the expense of flushing efficiency, nor should it be overlooked that careful piping to the closet tank and away from the closet bowl is an essential for quietness. Much is added to the appearance of such closet outfits by concealing within the wall the supply pipe to the tank, having it enter the tank at the back near the top and having the tank mechanism to include the self-contained shut-off valve. It is desirable likewise to have all the metal parts covered with the popular white Ivoroid finish.

Another tendency in closet design should be mentioned: the sanitary projecting front which insures a bowl longer from front to back with its consequent sanitary advantages. At first the inertia of conservatism kept this type from the popularity it justly deserved. A decided change, however, has taken place, and this type is now considered indispensable for fine private bathrooms in hotels, apartments, etc., and is being frequently specified for modern residences.

In conclusion, there is now a decided tendency to equip kitchen sinks with a double mixing sink faucet instead of two separate faucets. The mixing device should have a swinging nozzle, which can be pushed back out of the way when not in use, and the valves should operate so as to give hot, mixed or cold water at almost an instant's notice.

The faucet has proved a popular acquisition to modern plumbing equipment. It saves time and lightens the housewife's labors very materially.
The Why of Peeling and Scaling

WHY is it that paint curls up and drops off some parts of the walls and sticks perfectly tight on others?

The following discussion of the matter was prepared by National Lead Company's technical service department:

"When paint comes off plaster walls the defect may take place in two ways due to quite different causes. We describe these two defects as scaling and peeling.

"All materials expand and contract with changes of temperature and plaster walls are no exception. There is also some shrinkage of the plaster during aging. The paint film must therefore be sufficiently elastic to follow the movement of the surface over which it is applied.

"In addition to being elastic the paint must have certain penetration and form a firm bond with the surface painted.

"If a paint film becomes hard and brittle as it ages, it loses its elasticity and is unable to follow the changes which take place in the surface of the wall. It fractures instead of stretching. A continuation of the action, aided by the slight amount of moisture which may get in through the cracks, causes the edges of the pieces of paint film to curl outward, and, eventually, to come off.

"This is the explanation of scaling which is so often noted on wood and metal and less frequently on plaster walls. The hardening process which is the cause of this defect is nearly always due to certain pigments used in the paint, which through their action on the oil, bring about the brittle condition. Scaling nearly always takes place after the paint film has been on the walls for a long time, often as much as five or six years being required to fully develop the trouble, because of the fact that the hardening takes place very slowly.

"In the case of peeling the pieces which come off are usually much larger than when the trouble is due to scaling.

"Peeling may take place at any stage in the life of the paint film, within a few days after application or after a number of years. It is almost always caused by moisture back of the paint film, due either to the painting of plaster while it is still wet or to leakage back of the plaster which works through to the paint. Peeling may take place with fresh paint film while it is still quite soft and elastic, or with older paint films which may be comparatively hard.

"As peeling is caused by moisture, it may take place with any kind of paint, but is fairly easy to prevent. Scaling, on the other hand, is directly caused by the character of the paint and may be prevented only by using paint made with proper materials. It is an outstanding characteristic of white-lead paint that cracking and scaling practically never occur when it is used.

"Paint made with white-lead and the proper paint vehicles seems to have great penetration and readily forms a bond with nearly all surfaces on which it is applied. It also seems to remain elastic so that it follows the movement of the surface painted.

"These statements are by no means entirely based on theoretical considerations, as our many years of experience have shown us that paint made with white-lead is free from this trouble."
Medium Cost Homes

COMMENCING with this number The Architect and Engineer will show each month a portfolio of medium cost homes suitable for city and country sites. The demand for houses, ranging in price from $5000 to $20,000, is steadily increasing, and it is the purpose of this magazine to present photographs and working drawings of homes that have been built recently and which are not only livable but original in design and attractive in appearance. Several of the houses in this issue show a special plan for the conservation of space by use of wall beds and other built-in furniture. The wall bed has many advantages, particularly to the small home builder, whose financial circumstances require a house possessing a limited number of rooms.
FIVE ROOM BUNGALOW.
H. C. BAUMANN, ARCHITECT
FIVE ROOM BUNGALOW. SAME FLOOR PLAN. H. C. BAUMANN, ARCHITECT.
A COSY AND ATTRACTIVE BUNGALOW

This lovely home, while having only five rooms, offers sleeping accommodations for six persons with all the rooms on one floor. The architect has used wall beds to conserve expensive floor space, by utilizing dining room and living room at night as bedrooms.

Either of these floor plans may be used.
AN ATTRACTIVE DOUBLE BUNGALOW

This double bungalow with its two homes under one roof offers financial assistance to prospective builders. The owner has a comfortable home of three rooms free of rent while the income from his tenant pays interest, taxes, and current expenses. Small investors have found this type of building very profitable.
In plan 13 the library has been designed to be of service both day and night, being equipped with a wall bed, which is attached to the writing desk and invisible during the day.

Either of these floor plans can be used with the above illustration.
Finishing Interior Wood Trim
By A. H. Burt in National Builder

The interior trim of a residence might be likened to the frame of a picture. Either can greatly enhance the beauty of the effect, or can seriously detract from it. For this reason the selection of the type of finish to be used on interior trim is of major importance. The unwise selection of but one material entering into the finishing, such as stain, can ruin the whole effect. Knowledge of the peculiarities of materials used in interior finishing is therefore equally as important as knowledge of finishing methods.

There are three popular methods used today in finishing the interior trim of residences. These are the stained and varnished finish, the stained and waxed finish and the enamel finish. The first two finishes can be used to advantage on any kind of wood, whereas, the enamel finish is very seldom used on anything but close-grain woods. In considering the finishing of interior trim, it is best for the purpose of discussion to divide the woods into two classes, namely, open-grain woods and close-grain woods. A list of the woods used for interior trim in this country is given below, divided into the two classifications:

<table>
<thead>
<tr>
<th>Open-Grain</th>
<th>Close-Grain</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ash</td>
<td>Bass wood</td>
</tr>
<tr>
<td>Butternut</td>
<td>Beach</td>
</tr>
<tr>
<td>Chestnut</td>
<td>Birch</td>
</tr>
<tr>
<td>Elm</td>
<td>Cedar</td>
</tr>
<tr>
<td>Mahogany</td>
<td>Cherry</td>
</tr>
<tr>
<td>Oak</td>
<td>Cypress</td>
</tr>
<tr>
<td>Rosewood</td>
<td>Fir (Oregon Pine)</td>
</tr>
<tr>
<td>Walnut</td>
<td>Gum</td>
</tr>
<tr>
<td></td>
<td>Holly</td>
</tr>
<tr>
<td></td>
<td>Maple</td>
</tr>
<tr>
<td></td>
<td>Pine</td>
</tr>
<tr>
<td></td>
<td>Poplar</td>
</tr>
<tr>
<td></td>
<td>Redwood</td>
</tr>
<tr>
<td></td>
<td>Spruce</td>
</tr>
<tr>
<td></td>
<td>Sycamore</td>
</tr>
<tr>
<td></td>
<td>White wood</td>
</tr>
</tbody>
</table>

The first step in the finishing of interior trim with stain and varnish is to be sure that the surface is in proper condition—that it is dry, sanded smooth and clean and free from stains. Stains on the trim can usually be removed by sanding, although in the case of grease, stains can be removed more easily with benzine or benzole, while paint spots are best removed with turpentine and then sanding. The next step after the trim is in condition for finishing, is the application of a stain.

Stains can be grouped under three classifications: acid, oil and spirit (penetrating). Each of these three classes of stains has a use for which it is particularly adapted, and under certain conditions will produce a more satisfactory effect than either of the other two stains.

Acid stains are stains made with water soluble dyes, and have water for their vehicle. This type of stain raises the grain of the wood, which makes it necessary to take more pains in the finishing where this type of stain is used. Where acid stains are to be used, most finishers will sponge the surface of the wood to be finished with clear, cold water, in order to raise the grain. When dry the wood is sanded, then when the acid stain is applied, there is little or no tendency to raise the grain. This extra operation in sponging and sanding the wood adds to the cost of the finishing, and in some cases it is not justified, due to the fact that just as attractive effects can be secured with other types of stains. Due to their tendency to raise the grain of the wood, acid stains are seldom used with any degree of satisfaction for the finishing of soft woods.
Acid stains would not be popular if it were not for the fact that they have certain advantages which offset their disadvantages. For example, red mahogany acid stains are almost invariably more fast to light than the red mahogany stains which are found in the oil stain or spirit stain groups. This makes it a distinct advantage to use this type of stain for the finishing of surfaces which are to be subjected to strong sunlight, such as exterior doors and the trim in show windows.

Oil stains are made with oils as a vehicle. These stains are ideal for soft woods, but hardly suitable for hard woods, where deep stained effects are desired, due to the lack of penetrating power of this type of stain. Oil stains do not raise the grain of the wood, and in their way are a preservative to the wood itself. They are very slow in drying, and the surface stained with oil stains is almost invariably wiped with a soft cloth about 30 minutes after the stain has been applied, due to the fact that there is usually a presence of pigment which has not been dissolved into the vehicle, which remains on the surface of the wood. If the surface were not wiped, a clear-cut stained effect could not be secured. Fully 24 hours should be allowed for the drying of oil stains before subsequent coats are applied.

Spirit stains, or so-called penetrating stains, are made from spirit soluble dyes. The vehicle in the stain is of the spirit type, frequently alcohol. Spirit stains can be used for finishing all kinds of woods, although the best effects are secured on hard woods—soft woods being more porous, take a darker effect. Spirit stains will not raise the grain of the wood, but differ from oil stains in that it is necessary to “seal” them into the wood with shellac in order to prevent them from “bleeding” into the subsequent coats of varnish, and impairing the drying qualities thereof.

Generally speaking, spirit stains are the most popular of any of the three types of stains. The colors of this type of stain are generally the richest. About the only difficulty experienced with spirit stains is that some of the red mahogany shades are not entirely permanent.

The next step in the finishing of the trim differs in the case of open-grain woods and close-grain woods. In both cases, however, all nail-holes and cracks in the wood are filled to a level surface with pure lead and oil putty tinted to match the finish. On close-grain woods, the next operation is the application of a thin coat of shellac—white or orange, depending upon the color of the stain. In the case of open-grain woods, the next operation after staining is the filling of the pores of the wood with paste filler. Fillers are applied in order to fill the pores of the wood, and bring them to a level surface, so that the subsequent coats will not sink into the pores of the wood, and produce an uneven effect. Where paste filler is omitted, a coat of shellac and a coat of flat drying varnish is usually applied to produce a so-called “mission” effect.

Paste fillers come in paste form and are reduced with benzine to the consistency of cream by the finisher, and then applied with a brush. The filler is allowed 30 minutes to “set up,” or to dry out, and then is wiped off across the grain of the wood with burlap or excelsior, leaving the pores packed with this material. The wiping off of the paste filler tends to scour the surface of the wood, and bring out beautiful highlights in the wood. Since paste fillers are sold in various colors, they are sometimes used alone without stains for producing delicate stained effects on open-grain woods.

In selecting paste fillers, it is greatly to be desired that nothing but the best quality filler be purchased, because a great part of the unsatisfactory finishing results are due to the use of cheap paste fillers, which
either swell and cause little ridges to appear in the finished surface, or shrink and cause the varnish coats to sink into the pores after them. Unsatisfactory results are also sometimes secured with high quality fillers, due to the fact that sufficient time is not permitted for drying. Where possible, it is desirable that a period of 48 hours be allowed between the application of the paste filler, and the application of the subsequent finishing coat.

As stated before, a coat of shellac is the next coat to follow the stain on close-grain woods, while on open-grain woods paste filler is applied after the stain, and the shellac coat follows the paste filler. Expert finishers maintain that the shellac coat should be as thin in consistency as it is possible to have it, and yet serve to seal the wood thoroughly. The reason for this is that shellac is quite brittle, and differs greatly in elasticity from the finishing coats of varnish which follow it. If a heavy coat of shellac is applied, one has a brittle foundation for the varnish, which means that the finish will mar easily, because while the varnish may be tough, the shellac which is under it will splinter and powder, if the finish is subjected to a knock or a blow, resulting in an ugly effect in the finish, and making it appear as if the varnish itself is at fault. When thoroughly dry, the shellac coat should be sanded with No. ½ sandpaper, in order to "knock off" the gloss and rough spots, and to expedite the taking hold of the varnish coat which follows it.

The number of coats of varnish which are to be used, depends entirely upon the quality of finish desired. On the cheaper grade of work, one coat is usually all that is applied after the shellac coat. One coat, however, does not admit of satisfactory rubbing to a dull finish, hence where but one coat of varnish is to be used, and a dull finish is desired, it is best to use a special flat-drying varnish, which produces an imitation rubbed effect, of which there are several satisfactory brands on the market. While in the better class of finishing, three coats of varnish are sometimes used, it is the writer’s personal experience that two coats of varnish will produce a high class and satisfactory finish. Where two coats of varnish are employed, sufficient time should be allowed for drying between coats, and the first coat of varnish should be lightly sanded when dry with No. 00 sandpaper to "knock off" the gloss.

The dull-rubbed finish is the popular finish today. This effect is secured by rubbing the final coat of varnish, when sufficiently hard, with powdered pumice stone and water, or oil. The water tends to harden the varnish, while the powdered pumice stone rubs down the gloss. Rubbing oils are preferred by some finishers, due to the fact that one does not have to be so careful about rubbing through the varnish coats down into the finish. Where rubbing oils are used, it is desirable to use either pure linseed oil or a high grade of rubbing oil.

The method of building up a waxed finish is similar to that of the varnished finish. Due to the fact that wax dries almost immediately after application, it requires a shorter period of time for finishing. The varnished finish is more durable and is probably more popular for this reason.

Where a waxed finish is desired, wax coats may be substituted for the varnish coats. The finish should be built up for this particular type in the same manner as it is built up for the varnish finish, up to and including the coat of shellac. Two coats of wax should be applied for a high quality of waxed finish. A high grade prepared paste wax is generally used, and is applied with a soft cloth.
INSTITUTE ATTITUDE ON COMPETITIONS

Since its foundation, more than fifty years ago, the American Institute of Architects has given much attention to the conduct of architectural competitions. These contests, instituted when the direct selection of an architect could not be made, were for many years conducted without proper regulation and often in disregard to the interests both of the owner and of the competitors. The owner, totally unfamiliar with the intricacies of the subject, assumed, without skilled assistance, to prepare the program, laying down, or more frequently ignoring, rules to govern procedure.

With the growth of the country, the increase in expenditures for public and private buildings, and the increase in the number of architects, all the evils of ill-regulated competitions became more marked. Programs varied from loose and careless forms, difficult to understand and often open to the suspicion that only the initiated knew what they meant, to over-elaborate ones necessitating useless study of details and needless drawings. Those instituting the competition often had no legal authority to pay any competitors, still less to employ the winner. There was great economic waste, the total cost of participation exceeding the total net profit accruing to the profession from work secured through competitions.

Architects have learned that the outcome of a competition, unless governed by well-defined agreements, is largely a matter of chance. The owner has, to be sure, a choice of designs, but he is no more likely to make the wisest selection or to obtain the best building than if he selects his architect directly guided by the results previously achieved by the men he is considering.

When a competition is necessary or desirable, it should be of such form as to establish equitable relations between the owner and the competitors.

To insure this:

1) The requirements should be clear and definite, and the statement of them, since it must be in technical terms, should be drawn by one familiar with such terms.

2) The competency of all competing should be assured. The drawings submitted in a competition are evidence, only in part, of the ability of the architect to execute the building. The owner, for his own protection, should admit to the competition only those to whom he would be willing to entrust the work; that is, to men of known honesty and competence.

3) The agreement between the owner and the competitors should be definite, as becomes a plain statement of business relations.

4) The judgment should be based on knowledge, and since ideas presented in the form of drawings are intelligible only to a trained mind, judgment should not be rendered until the owner has received competent technical advice as to the merits of those ideas.

To sum up: To insure the best results a competition should have (1) a clear program, (2) competent competitors, (3) a business agreement, (4) a fair judgment.
Fifteen years ago many competitions had none of these provisions and few had all of them. The commonest form of competition was one that was open to all, had a program prepared by a layman, was judged by the owner without professional assistance, contained no agreement, and made no provision to eliminate the incompetent.

All this demanded correction. The Institute, seeking a means of reform, perceived at once that its relation to the owner could be only an advisory one. It might advise him how to hold a competition, but it could go no further. To architects in general the Institute could scarcely presume to offer even its advice, but being a professional body charged with maintaining ethical standards among its own members, its duty was to see that they did not take part in competitions that fell below a reasonable standard.

It was, therefore, voted in convention that members should be free to take part in competitions only when their terms had received the approval of the Institute. Thereupon the latter fully stated the principles which should govern competition and defined the conditions prerequisite to the giving of its approval. Committees throughout the country are authorized to give its approval to competitions when properly conducted, but unless a program has received such approval members do not accept a position as competitor or juror, nor does a member continue to act as professional adviser after it becomes evident that the owner will not permit his program to be brought into harmony with the principles approved by the Institute.

One of the most satisfactory competitions held under the above rules was recently concluded in Los Angeles, the result being published very fully in this magazine last month. We refer to the St. John's Episcopal Church competition, participated in by five leading architectural firms of the Southern city.

**Notes and Comments**

Should architects advertise? This question is becoming a really serious one with the profession and the number who are disposed to answer it in the affirmative is increasing rapidly. But there is a decided difference of opinion as to just how this advertising shall be done. Newspaper and magazine display—no; very few architects in good standing are ready for such a radical step just yet, and it is to be hoped they never will be, for such publicity savors too much of the "quack doctor methods."

The day when the architect awaits the coming of a client in a comfortable swivel chair has passed. Clients these days do not seek the architect, as a rule. On the other hand the architect must seek the client if he intends to keep his draftsmen busy. And this brings up the question of just how and under what circumstances the architect should offer his services. If he goes about it in a straight forward, business like manner he is not likely to make an unfavorable impression, such as the following incident is said to have produced:

A big corporation was reported some time ago as being on the eve of starting a lot of building. The president happened to be a close friend of the writer, so told him of his architectural experience. Four architects called on him and tried by more or less subtle ways to persuade him into employing them. Seven wrote him—not business-like communications—a list of their important work, qualifications and that sort of thing, but the letters were meandering and pointless; were weak, half begging affairs; semi-social reminders of a church or lodge affiliation or some equally strong claim upon his attention. A dozen other architects were mentioned to him, one by the pastor of his church, several by club
friends, and others by business associates, feminine members of his household, and one by the janitor in his office building.

Now what do you suppose that man thought of the business tactics, the "approach" of the profession, its lack of stand-up, direct methods? He actually dreaded to leave his house in the morning, expecting to meet half a dozen architects' emissaries on his door step. It was his first "run-in" with the architects, and these men were clamoring to handle several million dollars of that company's money. What sort of handling could he expect them to give it? * * *

The old notion that the profession is an art, and that any business method in its handling is a desecration, a profanation, is playing havoc with the business getting end of the profession. It's business-like to maintain an office, pay salaries and rent. Likewise it is business-like to keep tab on costs, make contracts and try and get work done at low figures. Then why is it not business-like or according to Hoyle of business to seek clients in a similarly business-like manner, legitimately and boldly, but not as a beggar asking alms? * * *

Unfortunately many business men regard the architectural profession as constituting largely a cheap class of men. These business fellows never would think of asking three or four tailors to make them up suits of clothes in competition. Their natural procedure would be to order one suit and pay for it. But they have no compunction in asking a dozen architects to compete for the most trivial building project. One man told me, less than a week ago, that he had received twenty-six sketches for a $50,000 building and felt very magnanimous because he had paid out $150 in prizes. * * *

The other morning on the train the writer got into conversation with a very successful builder of suburban houses. Some of these are really attractive, so I casually asked him who was his architect. Not knowing my business he grew confidential and assured me that securing architecture was a snap. When he got ready to build another house he let half a dozen "archeetcks" know about it and invariably received three or four sketches. A draftsman traced these off and the sketches would be returned as not suitable, the draftsman meanwhile planned the house and used whatever ideas, from the collection, he thought better than his own or the builder deemed available. Yes, and often the men whose sketches had been returned sent still others in the hope of getting that house to build. Pay an architect? Not he. * * *

The writer has an architect in mind in San Francisco who never lacks good and profitable work. When he hears of a building project he sends an ad to the man—a letter telling him what his rates are, what work he has done, gives his bank and other references, solicits his business and encloses a list of buildings—important ones, too, most of which have been completed at within 3 per cent, one way or the other, of his estimates and with brief notes from the owners saying so. Now isn't that an infinitely more manly and business-like proceeding and a far stronger appeal to a business man than a procession of sisters-in-law or reverend and masonic friends coming to tell one how pleased they would be to have the job given to So-and-So because he is such a nice man!—The Observer.

Christian Science Churches

Architect Henry H. Gutterson, 278
Post street, San Francisco, is preparing plans for a $60,000 church for the Third Church of Christ, Scientist, Oakland.

Architect William Newman is preparing plans for a $30,000 church to be built on Oxford street, Berkeley, for the Second Church of Christ, Scientist. Mr. Newman has opened offices at 614 Grant building, San Francisco.
With the Architects
Building Reports and Personal Mention of Interest to the Profession

Architect George E. McCrea Busy
Architect George E. McCrea, 369 Pine street, San Francisco, has been commissioned to prepare plans for a church, parochial school and residence for Our Lady of Lourdes, at Lakeshore and Prospect avenues, Oakland, at a probable cost of $180,000. Other work in Mr. McCrea’s office includes extensive alterations to the country house of Dr. George Herbert, near Watsonville; an eight-room rustic home at Carmel for Mr. Herman A. Spoehr, and a house at Santa Cruz for Mr. L. T. Bachman.

A. C. Blumenthal to Build
Mr. A. C. Blumenthal, well-known San Francisco real estate promoter, has commissioned Architect G. A. Lansburgh to prepare plans for two large apartment houses, one to be built on the northwest corner of Jackson and Laguna streets, having two hundred rooms, and the other to be erected on the southeast corner of Powell and Sacramento streets. Construction of both buildings, which will represent an investment of a million dollars, will be in charge of MacDonald & Kahn.

Eight-Story Apartment House
Plans are being prepared by Mr. E. A. Fritz, 116 Frederick street, San Francisco, for an eight-story steel frame reinforced concrete apartment house to be erected on the south side of California street, west of Mason, San Francisco, for Miss Laura I. Fritz. The building will contain apartments of from eight to twelve rooms each, and will cost in excess of $250,000.

To Design Country Bank
Architect James T. Narbett, Syndicate building, Oakland, has been commissioned to prepare plans for a one-story reinforced concrete bank building for the Calistoga National Bank, Napa county, to cost $35,000. Mr. Narbett has completed plans for a large residence in Alameda for Captain H. S. Pond and for the new Junior high school building in Richmond, the latter to cost $200,000.

O’Brien Bros. Busy
New work in the office of O’Brien Bros., 240 Montgomery street, San Francisco, includes a restaurant and dancing pavilion at Nineteenth avenue, near Sloat boulevard, for the Imperial Inn Company; a four-story reinforced concrete addition to a one-story building on O’Farrell street, near Jones, for Frank Kelley, and a two-story store and loft building on the north side of Sutter street, above Mason, for Messrs. Proctor & Chamberlain.

Government Hospital
Plans have been completed and bids are to be opened in San Francisco, April 10th, for the construction of a group of hospital buildings at Palo Alto, estimated to cost $1,400,000. The structures will replace temporary buildings comprising the U. S. Veterans’ Hospital. The plans were prepared in the Supervising Architect’s office, Treasury Department, Washington, D. C.

Salvation Army Building
Plans are being prepared by Architect Norman R. Coulter, Maskey building, San Francisco, for an eight-story territorial headquarters building for the Coast Division of the Salvation Army. A portion of the structure will also be used as a girls’ home for the Army. The estimated cost of the improvements is $225,000.

Physicians’ Building
A six-story steel frame concrete and brick office building, designed especially for rental to physicians and dentists, will be erected on the southeast corner of Sutter and Taylor streets, San Francisco, for Mr. J. S. Morgan. The plans are being prepared by Architect M. V. Politeo, First National Bank building, San Francisco.

Will Design High School Buildings
Architect William H. Weeks has been commissioned to prepare plans for a $500,000 group of school buildings for the Santa Barbara High School District and for a $200,000 high school building at Colusa for the Colusa Union High School District.
Clinton Lands Two Contracts
The Clinton Construction Company, 140 Townsend street, San Francisco, submitted the low bid for the main portion of the contract for the Aquarium building in Golden Gate Park, San Francisco, from plans by Architect Lewis P. Hobart. This firm was also the low bidder and has been awarded a contract for the construction of a twelve-story reinforced concrete office building at Eighth and Spring streets, Los Angeles, for the San Joaquin Valley Hotel Company. The contract price is $375,000.

Designing New Homes
Architect Henry H. Gutterson is preparing plans for several large homes to be built in St. Francis Wood, San Francisco's fashionable residence district. One of these houses is for Mr. Hart Weaver, automobile distributor, and the second house is for Mr. Paul K. Judson. They will cost about $20,000 each.

Test Highway
Preparations are being made to rebuild four sections of the test highway at Pittsburg, Contra Costa county. These sections have given way under the heavy traffic and must be rebuilt in order to complete the test of the remaining portion of the highway. Traffic will be resumed some time in April.

Masonic Home Addition
Plans have been completed by Mr. William Mooser, architect, and Mr. Edward G. Bennett, associate architect, of San Francisco, for extensive additions to the Masonic Home at Decoto, Alameda county. Bids are now being received from various sub-contractors. There is an appropriation of $300,000 for the work.

Architect to Build
Mr. Ira W. Hoover, whose residence is at Plana da, near Merced, is preparing plans for a country house to be built at Plana da for Mr. Byron Warner, an Eastern architect, who intends to spend a portion of his time in California.

Ukiah Grammar School
The citizens of Ukiah have voted $80,000 in bond money for a new grammar school, and Architect Norman R. Coulter has been commissioned to prepare plans for a reinforced concrete building of eight rooms and assembly hall.

Store and Office Building
A large store and office building is to be constructed at Taft, Kern county, from plans prepared by Architect Chas. H. Biggar of Bakersfield.

Littlefield Secures Two Contracts
Mr. R. W. Littlefield, Oakland contractor, has been awarded the contract to build the new Pacific Gas & Electric Company's building in Oakland for $318,500. Mr. Littlefield also has the contract to build the new Haynes Garage at Fourteenth and Harrison streets, Oakland, from plans by Architects Meyer & Johnson of San Francisco. Mr. W. L. Kelly, formerly with Palmer & Petersen, is now connected with the Littlefield staff.

Applied Mechanics—Reinforced Concrete
Evening classes for the study of Applied Mechanics and Reinforced Concrete construction are to be held in San Francisco under the direction of Mr. Harry W. Bolin of the H. J. Brunner Company. The course will be for architects, engineers, draftsmen and others technically qualified. The classes will be held in Room 266, Pacific building, San Francisco.

San Mateo Amusement Park
Plans are being prepared by Architects Kuhn & Edwards, Commercial building, San Francisco, for the new "Pacific City," an amusement resort to be built along the waterfront of San Mateo. There will be a large bathhouse, dancing pavilion, skating rink, restaurant, stadium, etc.

School Buildings at Taft
Architect Orville L. Clark of Bakersfield is preparing plans for a number of new school buildings to be built under a bond issue at Taft, Kern county. These will include a gymnasium, swimming pool, domestic science and arts building and shops.

Apartments and Flats
Mr. H. C. Baumann, 251 Kearny street, San Francisco, has completed plans for a two-story frame apartment house to be built on 13th avenue, between Geary and Clement streets, San Francisco, for Mr. John Schroeder.

School Building at Auburn
Messrs. James S. & Chas. Dean, 1351 40th street, Sacramento, have been commissioned to prepare plans for a new $100,000 high school building for the Placer Union High School District at Auburn.

Los Angeles Building
Architect S. Heiman, 57 Post street, San Francisco, has been commissioned to prepare plans for a commercial building on Hill street, near Seventh, Los Angeles, for the Dunn-Williams Company of San Francisco, at a cost of $200,000.
Mr. Glass Explains

Editor The Architect & Engineer, San Francisco:

Some time ago certain advertising matter appeared in the San Francisco Chronicle to which was attached a reading notice referring to the activities of the firm of Glass & Butner, architects, of which Mr. Edward Glass was then a member. The matter contained in the reading notice caused much unfavorable comment by reason of certain criticism contained therein, and also because a non-certificated architect was apparently mentioned as an associate of the firm.

The following copy of a letter addressed to the board and signed by Mr. Glass is self-explanatory as to the foregoing, and we trust that in justice to Mr. Glass and the State Board of Architecture that this letter will be given the fullest publication.

"February 18, 1922.

State Board of Architecture, Phelan Building, San Francisco.

GENTLEMEN:

Referring to the publication of an item in the San Francisco Chronicle purporting to be an interview with me regarding the work of the firm of Glass & Butner, and which was called to my attention by the Board, I desire to state that the subject matter as it appeared in print was entirely at variance with the data given by me, and was not approved or sanctioned by me or by any other person acting for me.

Yours very truly,
(Signed) Edward Glass.

STATE BOARD OF ARCHITECTURE, NORTHERN DISTRICT.

By Sylvain Schnaittacher, Secretary.

Open Engineering Office

Mr. D. S. Reynolds, formerly representative in San Francisco and Los Angeles for the Dunham Co., and Mr. A. H. Hubbard, for some time representative for the D. S. Sturtevant Co., have opened an office at 528 Title Insurance building, Los Angeles, as heating and ventilating engineers. They have commissions from the Los Angeles Board of Education for laying out the heating systems for three new school buildings.

Architect to Build Home

Architect Joseph L. Stewart of San Francisco has completed plans for a $20,000 home in St. Francis Wood. Monson Bros. will be in charge of construction.

Contractors Move

C. L. Wold Co., general contractors, of San Francisco, announce the removal of their offices to rooms 319-321 at 185 Stevenson street. Their phone number is Sutter 4971.

Paso Robles Apartments

Messrs. Miller & Warnecke are preparing plans for a two-story brick store and apartment house for Mr. Clark Smith of Paso Robles.

Will Continue Open Shop Plan

Under date of February 23, the Pacific Manufacturing Co., manufacturers of millwork, sash and doors, announced that its factory at Santa Clara was gradually nearing full production again after having adopted in January the American plan of operation, which resulted in the necessity for rebuilding its organization. The declaration in favor of industrial freedom was made by the company on January 21, the workmen retaliating by refusing to return to the factory, although many had been employed in the plant for years. The company states that under no circumstances will it return to closed-shop conditions.

Fresno Wants Sugar Pine Mill

Fresno is making an effort to secure a new mill of the Sugar Pine Lumber Co., which it is estimated will cost $5,000,000 and employ 2000 men. The company has had its home at Madera for the last 25 years and that town has offered $100,000 cash and land bringing the total offer up to nearly $1,000,000 to secure the plant.

Passing of Los Angeles Engineer

Mr. Karl D. Schwendener, for more than eight years engineer in the Los Angeles city building department, and later practicing architect and engineer, died January 22 at his home in Glendale of pneumonia. He had been ill about ten days. Mr. Schwendener was 35 years of age.

Second Unit to Southern Pacific Building

A second unit is to be built soon to the Southern Pacific terminal warehouse, at Berry and Townsend streets, San Francisco. Leases are now being closed with a number of wholesale firms. Approximately $2,000,000 will be expended. Bliss & Faville are the architects.

Joint Meeting

The California State Board of Architecture, Northern and Southern Division, will hold a joint meeting in Los Angeles April 6th. The two Chapters, A. I. A., will also meet in the Southern city early next month.

$500,000 Office Building

Mr. A. H. Albertson, Henry building, Seattle, is the architect for a six-story, $500,000 building to be erected at the corner of Fifth avenue and Union street by the Metropolitan Building Company.

Personal

Mr. Edgar W. Maybury is now associate member of the firm of Sylvanus B. Marston and Garrett B. Van Pelt, Jr., architects, Chamber of Commerce building, Pasadena.
Chapter Members to Design Schools

The Washington State Chapter, A. I. A., at its February meeting received a report from a special committee on school buildings. Following a request from Mrs. Josephine Preston, State Superintendent of Schools, that the chapter advise with the State Superintendent of Education with reference to school buildings throughout the State, the following recommendations were made:

(1) The chapter to institute a competition among members for one and two room school buildings; (2) Working drawings of the above to be sold; (3) List of chapter members to be distributed throughout the State to the county superintendents. The selection of architects for school buildings to be made from these lists. (4) That the chapter form a special committee to criticize school plans, as such inspection is now required by law and requested of the chapter by Mrs. Preston.

Seattle Architectural Exhibition

The Washington State Chapter, A. I. A., will hold an Architectural Exhibition in the galleries of the Seattle Fine Arts Society, 1213 Fourth Avenue, Seattle, Washington, from April 2 to May 1, 1922. All members of the chapter are requested to send in drawings and photographs of buildings already erected or in project, details, perspectives, sculpture, wood carving, models, metal work, pottery, furniture, etc.

A jury will select twelve or more of the best buildings for publication in the May number of the San Francisco Architect and Engineer.

Address all correspondence regarding the exhibition to Mr. J. S. Cole, 621 Lyon building, Seattle, Wash.

Landscape Architect Busy

Emerson Knight, landscape architect, is preparing plans for the garden of Mrs. H. B. Allen, 290 Sea Cliff Avenue, San Francisco. Also for the landscape treatment of a group of 17 houses for L. D. Allen & Co. as an addition to the development scheme of Windsor terrace, San Francisco. Mr. Knight will continue the landscape development of the Merle B. Moon estate at Saratoga, and he is also preparing planting plans for Allen & Co. for a group of three homes on Lake street, between 29th and 30th streets, San Francisco.

Los Angeles Chapter Committees

President Sumner Hunt of Southern California Chapter, A. I. A., has appointed standing committees to serve during the year 1922 as follows:

Institute and Chapter Affairs Committee—Edwin Bergstrom, chairman; Robert H. Orr, secretary; John P. Krempel, Octavius Morgan and H. M. Patterson.


Education and Publicity Committee—David C. Allison, chairman; Fitch H. Haskell, secretary; Myron Hunt, W. J. Dodd and S. M. Spaulding.

Membership Committee—Charles F. Plummer, chairman; R. Germain Hubby, secretary; T. Beverly Keim Jr., Wm. F. Staunton Jr., and Frank Hudson.

Public Service Committee—Alfred W. Rae, chairman; Henry F. Withey, secretary; J. J. Backus, David J. Wither and O. W. Morgan.

Affiliated Societies and Allied Arts Committee—Clarence E. Noerenberg, chairman; Wm. M. Clarke, secretary; H. C. Chambers, Pierpont Davis and Wm. Richards.

Board of Mechanical Engineers—O. W. Morgan, chairman; Clarence E. Noerenberg.

Committee to Represent Chapter on City Planning—(Traffic Conference)—Clarence E. Noerenberg.

Contractor Cannot Recover Architect’s Fees

That a contractor cannot recover an amount claimed to be due him for services rendered as an architect was decided by Superior Judge A. W. Frater of Seattle, recently, in the case of L. H. Os- terud vs. W. E. Howard.

Suit was instituted by the plaintiff and the recovery of $91.40 claimed to be due for certain repairs and alterations, asked. This amount was allowed by Judge Frater. In addition, however, the plaintiff demanded $398 “for professional services as architect in preparing plans and specifications.”

This claim was rejected by the court because of the State license law which prohibits other than a licensed architect from practicing architecture. The $398 asked by plaintiff was 5 per cent of the estimated cost of the work contemplated.

Opens Los Angeles Office

Mr. Wm. A. Larkins, a prominent building contractor of Salt Lake City, has moved to Los Angeles, where he has opened an office at 325 Title Insurance building. Mr. Larkins was for a number of years with the Thompson-Starritt Company when that organization operated in San Francisco.

Odd Fellows’ Building

Mr. Ernest Kroner, architect, 430 Worcester building, Portland, is preparing plans for a $200,000 lodge and office building for the Odd Fellows.

It will be 100 feet square, six stories, steel frame construction with brick and terra cotta front.
With the Engineers
Reports from the Various Pacific Coast Societies, Personal Mention, Etc.

A Code of Ethics
"One of the distinguishing characteristics of a profession is its code of ethics, its sense of propriety and of honor," says Mr. H. O. Garman, calling attention to this code of the American Association of Engineers, of which he is president.

Any code of ethics must be predicated upon the basic principles of truth and honesty. "Whatevery things are true, whatsoever things are honest," are the things for which engineers must contend.

An engineer may not "go beyond and defraud his brother" by any underhanded act or method. He may not do or say anything that will injure his brother's reputation, or his business, for the purpose of securing his own advancement or profit. This admonition carries with it no obligation to refrain from telling the known and absolute truth about an unworthy brother, as a protection to others; but the truth so told must be such as can be substantiated, and he who tells it must have the courage which will not shrink from the consequences of his telling.

An engineer owes his client allegiance demanding his most conscientious service. But conscientious service to the client must never entail a surrender of personal convictions of truth and right.

An engineer who receives compensation from an employer may not receive gift, commission, or remuneration of any kind from a third party with whom he does business for that employer.

An engineer seeking to build up his business may not resort to self-laudation in advertising. He may state briefly the lines of work in which he has had experience, and enumerate responsible positions which he has held and give his references.

An engineer who employs others, either in his own service or in that of the client who employs him, should recognize in his relationship to them an obligation of exemplary conduct, of helpfulness and personal interest in those with whom he is thusly brought in contact, and he should discharge such obligation tactfully and kindly.

The honor of the profession should be dear to every engineer, and he should remember that his own character and conduct reflect honor, or the reverse upon the profession.

If, then, he so lives that his own honor shall never be smirched by his own act or omission, he will thus maintain the honor of the organization to which he belongs.

Says Registration Laws Aid Engineers Practice
"Engineering structures already receive much publicity, but the poor shrinking violet of an engineer is usually accorded but scanty recognition," said Mr. R. W. Crum, engineer of materials and tests, Iowa State Highway Commission, at the Conference on Public Information held by the American Association of Highway Engineers. "When the record-breaking achievement of a new waterworks system is completed, the speeches at the banquet are made by the local banker, dry goods merchant and secretary of the commercial club, but the engineer who designed and executed the job is lucky if he gets in on the feed. This is no one's fault but our own; we can as easily inform the public upon our connection with the work as can the promoters. The only difference is that they do it and we do not.

"For many years such public education has been sadly handicapped by the broadness of the term 'engineering' in the public mind. It is extremely difficult to give a man the definite impression we wish, when the term covers in his mind locomotive engineers, bricklayers, the boy that holds the rod, and the president of the Pennsylvania railroad.

"The first thing needed is a definite legal status and legal standard for professional engineers. I, therefore, recommend a concerted effort to secure the passage of registration laws in those States not now having them. Such laws are of great value in restricting practice to competent engineers, but from the publicity standpoint the legal standing and definition given the profession are invaluable. It will also be found that an intensive local publicity campaign will aid greatly in getting these laws upon the statute books."

General Goethals Visits Coast
General George W. Goethals, New York engineer and builder of the Panama Canal, recently visited San Francisco and other coast cities. General Goethals emphatically denied reports that he has been retained by, the San Joaquin Light and Power Company to supervise $40,000,000 worth of engineering. He declined to discuss the feasibility of bridging San Francisco bay.
Decision Outlaws Open Competition Plan

New American business methods and the probable development of large industrial combinations may result from the United States Supreme Court's decision on "open price" associations, is the opinion of The Bank of America, New York, expressed in a pamphlet recently published, and which contains the full text of the majority and dissenting opinions of the Supreme Court in the case involving the American Hardwood Manufacturers' Association.

"The decision of the United States Supreme Court in the case of the American Hardwood Manufacturers' Association, which in effect outlaws the 'open competition plan,' is one of the most important governmental actions in the history of American business," declares The Bank of America in commenting on the case. "The 'open competition plan,' as it is now practiced, will have to be radically revised and probably associations using it will reorganize within the limitations indicated by the Supreme Court's verdict. If this decision results in disintegrating trade organizations, which in a large number of cases it probably will, other agencies will have to take their place in performing essential business functions. It may be that the statistical and informational activities of the 'open price' associations will be continued under the supervision of a governmental agency like the Department of Justice.

"New selling and distributing methods may be devised to meet new types of competition. Manufacturers will cooperate in new organizations to carry on constructive public education, to eliminate wasteful practices, to strengthen foreign trade."

"This decision, together with other contemporary economic influences, will undoubtedly result in the development of larger industrial aggregations through mergers and combinations. The direct effect of such conditions may even be more powerful than any under the 'open competition plan.'"

As this decision is of far-reaching influence and interest, the demand for reprints of the text has been large. A copy of the pamphlet will be sent on request by The Bank of America, 44 Wall street, New York.

Fighting Floods With "Sausages"

Fighting storms with "sausages" is an effective method the California Highway Commission has tried out this winter in Southern California.

The "sausages," however, are not of the "fido" kind, but consist of dykes constructed of heavy steel mesh wire and filled with heavy rock. These dykes the workmen have dubbed "sausages." They are proving to be an effective method of combatting streams swollen to torrential proportions that threaten the State highway system.

Useful Data

A cubic foot of lump lime weighs from 60 to 70 pounds.
A 200-pound barrel of lime contains 180 pounds net of lump lime, or 3.1 cubic feet.
A 300-pound barrel of lime contains 280 pounds net of lump lime, or 4.7 cubic feet.
A bushel of lime consists of 60 to 80 pounds, or 1 to 1.3 cubic feet, depending on the state laws.
A pound of magnesium lime requires about one pound of water to form a paste, or about 25 gallons a barrel.
A barrel of lump lime gives from 6 to 9 cubic feet of paste; average about 7.5 cubic feet.
A cubic foot of hydrated lime weighs from 30 to 45 pounds, average about 38 pounds.
A small sack of hydrated lime contains 40 pounds, or 1 cubic foot.
A standard sack of hydrated lime contains 50 pounds, or 1.5 cubic feet.
A large sack of hydrated lime contains 100 pounds, or 2.5 cubic feet.
Hydrated lime requires about an equal weight of water to produce a paste. A 100-pound sack of hydrate gives about 2.3 cubic feet of paste.
A standard barrel of Portland cement weighs 376 pounds net and contains 3.8 cubic feet.
A sack of Portland cement weighs 94 pounds and contains about one cubic foot. It is usually considered as 100 pounds.
Cement paste weighs about 137 pounds per cubic foot.
One cubic foot of Portland cement will yield 8 cubic feet of paste.
The average wooden wheelbarrow load of broken stone is about 2.4 cubic feet.
The average wheelborrow load of sand is about 2.5 cubic feet.—Ex.

Death of J. S. Bogart

Mr. J. S. Bogart, a widely known construction engineer, passed away February 23 at his residence on the Alviso road, two miles north of Santa Clara, from pneumonia, following an attack of influenza. Mr. Bogart was a native of New York and was in his 45th year. He came to California 23 years ago, and for several years past practiced his profession in San Francisco, with offices in the Mills building. Mr. Bogart was in charge of construction of the Shredded Wheat plant in Oakland and the Beach-Nut factory in San Jose. He was a member of the Masonic order in San Francisco, also the Olympic Club, the Country Club and the Elks' lodge.
The holes in these butts are punched accurately to template, so they will exactly match holes in metal doors punched to similar templates.

The bottom ball tip is slotted, so it may be unscrewed and the pin and tip reversed, so that the butt can be used either right or left hand. Equipped with Stanley non-detachable, weather-protected, ball bearing washers. The ball tips have squared shoulders which are flush with the knuckle. The ball tip and pin are made of the same piece of steel. The pin has the Stanley patented, non-rising and self-lubricating features. This method of lubrication prevents wear on the inside of the knuckle. Closely fitting joints are obtained by the inner edges of the leaves being beveled.

As a foundation for the final high finish, a heavy plating of copper is deposited on the polished cold rolled steel, and an additional heavy plating of the finish required is placed upon the copper base.

The holes in these butts are punched accurately to template, so they will exactly match holes in metal doors punched to similar templates.

The bottom ball tip is slotted, so it may be unscrewed and the pin and tip reversed, so that the butt can be used either right or left hand. Equipped with Stanley non-detachable, weather-protected, ball bearing washers. The ball tips have squared shoulders which are flush with the knuckle. The ball tip and pin are made of the same piece of steel. The pin has the Stanley patented, non-rising and self-lubricating features. This method of lubrication prevents wear on the inside of the knuckle. Closely fitting joints are obtained by the inner edges of the leaves being beveled.

As a foundation for the final high finish, a heavy plating of copper is deposited on the polished cold rolled steel, and an additional heavy plating of the finish required is placed upon the copper base.

When writing to Advertisers please mention this magazine.
Does the Constructor's Profession Lack Idealism?

By J. B. Warrack

The subject of my talk only came to me yesterday after a brain-racking week of thought and feverish hunt for a timely topic. It was revealed through a chance meeting with a business acquaintance whom I had asked for a suggestion as to a proper subject for an address to the Builders' Association. He said, "Oh, talk about 'how to skin a job,' or 'gram a dollar'; those men have no other ideas—they have no ideals!"

I thought this over; have we no ideals? Are we just ordinary money-grabbers? At last I had a subject for my talk.

"Does the Constructor's Profession Lack Idealism?"

I will endeavor to acquaint you with these few thoughts on the subject, born only a few hours ago, and sincerely hope you will find some good in them, but I fear you will have to accept your position with resignation as the Swedish bridegroom did when the minister said, "Ole, do you take this woman Hilda Sorgen-son for your wedded wife, for better or for worse?" Ole replied, sadly, "Oh, well, aye tank aye get lettle bit of both." And that is probably what you will get in my talk this evening, a little bit of both.

The constructor by his experience and technical knowledge is well prepared to enter into public discussion, and should do so. To that end constructors (builders-contractors) should be members of local associations, devoted not only to the consideration of the technical points of the profession, but to the far more noble service to the community; that of being a co-operative part in public affairs.

In spite of the necessity of long hours in the office or on the job, studying, estimating and analyzing costs, the constructor must needs find time for the consideration of broader interests.

The lawyer, whose work brings him into contact with the people, has the advantage of public prominence which too often leads to his appointment on commissions of a technical nature which could have been filled more ably by a constructor. The doctors have long im-

*Address delivered before the Seattle Master Builders' Association, November 15, 1921.*
We specialize in

**Stair Work**

G. I. and W. I. Stairs
Spiral Stairs
Counter-balanced Stairs
Theatre Fire Escapes, etc.

Michel & Pfeffer

Tenth and Harrison Streets  
*Iron Works*  
Phone Market 730

Specify and Use

Schroeder
Direct-Flush Valves

*for your Toilet Installations*

Suitable for any type of building
Adaptable to any style toilet fixture

SOME OF THE TALKING POINTS THAT COUNT:

- No rubber or leather parts to wear out
- No noise or hammer
- Nothing to get out of order
- Adjustable to suit the pressure
- No corrosion—no leaks
- Saves repairs and waste of water

Send for latest circular "B" showing different types of installation

MANUFACTURED BY

STANDARD METALS MANUFACTURING CO.

Main Office and Factory: 1300-1302 No. Main St., LOS ANGELES
San Francisco Office: 15 Steuart Street

AGENCIES: San Diego Portland Seattle Salt Lake City Denver Phoenix

"The Schroeder’s Correct—Its Flush Is Direct"

When writing to Advertisers please mention this magazine.
And here is a quotation from a speech delivered by Thos. Streiff, a Tacoma builder:

"A composition for cheapness, and not for excellence of workmanship, is the most frequent and certain cause of the rapid decay and entire destruction of arts and manufacture."

Carl Lohman, a Seattle builder, said:

"Finally, become a master builder in fact; eliminate the blind plunge; accept responsibility; be prepared and show your capacity by programming your work."

Listen to the strong admonition of H. C. Bromley of the Hull Building Company, Seattle:

"Now if you are going to be successful in this organization, you have got to be honest. If you are not honest you will fail. You have got to be honest with yourself; you have got to be honest with your sub-contractor and your employees."

O. G. Hughson of Portland, said:

"The only cause worth while in the long run is the interest of the general public. The only ideal worthy of consideration is our supreme best in workmanship, in method and in quality service. The true spirit of an organization that places personal honor above selfish interest finds its truest expression in serving the public. The reactionary profit of this attitude has been foreordained to be greater by far than results from selfish, one man, go it alone direct action."

And finally, that distinguished constructor of Seattle, W. T. Butler, of the Butler Construction Company, said in a speech to the assembled builders:

"Do not forget that each man should know himself, should know his cost, should know his ability. He should play the game straight; be fair to the owner and the mechanic and the architect and to the engineer, and thus gain the confidence of all. Do not expect to get rich on one contract, but look to the future. The satisfied owner is most times worth more than the profit."

The constructor's profession and the construction business is far from being destructive of idealism.

Consider the building of the pyramids of Gizeh over 5000 years ago, built of granite blocks, five feet square and thirty feet long; the temples of the ancients, some of which still withstand the ravages of time—that famous roadway from Rome to Capua, the Appian Way, which is still in use after 2000 years.

Consider the hardworking monks of the twelfth century who toiled from sunup to sun-down erecting bridges, buildings and roads; they saw more clearly than many of this day the relationship between the path of industry and communication and the spread of knowledge.

Take the massive dams built by the constructors of this generation, which store the pure water of the mountain slopes after years of waste, the railroads built by hardy constructors who laid the steel so that the East and West might be linked inseparably together, the bridges which connect communities and hasten travel, the buildings which house the sick and wounded, the towering skyscrapers, houses of worship, factories, warehouses, hotels, theaters and others—what constructor—what builder has not been stirred by the romance of his profession?

Consider the men in our organization, yes, the men in this room, if you will, who rebuilt the city after the great conflagration of 1889—the men who built the fair buildings—the beautiful capitol buildings at Olympia, under most trying conditions—the men who stuck to the job and finished grand structures after facing financial ruin—the men who journeyed to far cities and built monuments to the ability of the constructors of the Northwest in Montana, Idaho, Oregon, California, Alaska, Iowa and far off Tennessee.

The men who built government cantonments, bettered housing conditions during the war; who moved a concrete school building through the streets of San Francisco so that room might be had for a more noble edifice; who built the Washington stadium, the Roosevelt high school, and thousands of the best constructed buildings in this section, are the men, gentlemen, who do things—men of deeds, not words—men of action—and who can say that THEY lack idealism?

No Limit on Productive Capacity of Individual Workmen

The international organization of bricklayers, masons and plasterers, comprised of 100,000 members of this union in all parts of the country, has agreed to the following basic principles to apply in construction work:

1—There is to be no limit to the productive capacity of the individual workman within the working day or any other given time.

2—There is to be no limit upon the right of the employer to purchase his materials wherever and whenever he may choose, whether those materials be union made or otherwise.

3—There is to be no favoritism shown by organized labor toward employers or trade associations or contractors' associations and no discriminations are to be indulged in against the independent employer who may not be a member of such an association.

4—The labor organization is not to be used or to permit itself to be used by material men or contractors as an instrument for the collection of debts or enforcement of the payment of alleged claims.
"One Room into Many, Many into One"
as applied in the Lafayette PresbyterianChurch, Buffalo, N. Y.

Clark & Arms, Architects

WILSON

Standard for Forty-Five Years

Folding and Rolling Partitions

FOR CHURCHES, SCHOOLS, OFFICES, Y. M. C. A BUILDINGS,
HOTELS, CLUBS AND OTHER PUBLIC INSTITUTIONS

For easy and instant subdivision of large rooms Wilson Partitions are standard. Prices have been reduced as much as possible.
Wilson Sectionfold Partitions are made to harmonize perfectly with interior decoration, new or old. Have every appearance and advantage of solid, permanent wall, yet at will disappearing, folding into small space, practically out of sight.

Presbyterian Church
Broad and Vernango Sts., Philadelphia

Wilson Rolling Partitions are lower in price than Wilson Sectionfold Partitions. Used where decorative adaptability and permanent appearance of the Folding Partitions are not so important. Their practical advantages have placed them in more than 38,000 churches, schools and public institutions.

Write for details of Folding and Rolling Partitions or any of the Wilson products. Wilson details and specifications in Sweet’s Catalogues.

The J. G. Wilson Corporation
Pacific Coast Office and Factory

621 NORTH BROADWAY,
LOS ANGELES, CALIF.

WATERHOUSE-WILCOX CO., San Francisco
Theo. P. Snyder, San Diego
S. W. R. Dally, Seattle
F. W. Farrington & Co., Portland
Walter Dubree, Phoenix
Hawley-Richardson-Williams Co., Salt Lake City
Comparative Installation Costs of Concrete and Corrugated Pipe on Three State Highway Jobs

That the labor costs for hauling and placing corrugated pipe are considerably less than those in connection with reinforced concrete is perfectly obvious from a comparison of weights per foot of the two types; but just how wide the difference is has been a matter of conjecture, since definite figures were lacking. The weights, according to California Highway Commission standards, are as follows:

<table>
<thead>
<tr>
<th>Diameter</th>
<th>Corrugated Pipe.</th>
<th>Reinforced Concrete Pipe.</th>
</tr>
</thead>
<tbody>
<tr>
<td>12&quot;</td>
<td>10.8 lbs.</td>
<td>90 lbs.</td>
</tr>
<tr>
<td>18&quot;</td>
<td>15.7 lbs.</td>
<td>146 lbs.</td>
</tr>
<tr>
<td>24&quot;</td>
<td>20.7 lbs.</td>
<td>200 lbs.</td>
</tr>
<tr>
<td>30&quot;</td>
<td>31.9 lbs.</td>
<td>355 lbs.</td>
</tr>
<tr>
<td>36&quot;</td>
<td>38.1 lbs.</td>
<td>507 lbs.</td>
</tr>
</tbody>
</table>

Figures just at hand in connection with three recent state highway grading contracts throw quite a little light on the matter of installation costs. Bids were called for on an alternate basis, the pipe to be either corrugated iron or concrete, according to later decision of the commission. The Highway Commission was to supply the pipe in either case, and deliver it to the railroad station nearest the work, so the calculations of the contractors were confined to hauling, installing and back-filling. The figures of the successful bidders were as follows:

<table>
<thead>
<tr>
<th>Diameter</th>
<th>No. Feet</th>
<th>Concrete</th>
<th>Corrugated Iron</th>
</tr>
</thead>
<tbody>
<tr>
<td>12&quot;</td>
<td>1,004</td>
<td>$1.75</td>
<td>$.75</td>
</tr>
<tr>
<td>18&quot;</td>
<td>1,662</td>
<td>2.50</td>
<td>1.00</td>
</tr>
<tr>
<td>24&quot;</td>
<td>428</td>
<td>3.80</td>
<td>1.25</td>
</tr>
<tr>
<td>36&quot;</td>
<td>182</td>
<td>5.00</td>
<td>2.00</td>
</tr>
</tbody>
</table>

5.7 miles in Mariposa county, between Sierra National Forest and Brickeburg. Rhodes & Price, successful bidders.

<table>
<thead>
<tr>
<th>Diameter</th>
<th>No. Feet</th>
<th>Concrete</th>
<th>Corrugated Iron</th>
</tr>
</thead>
<tbody>
<tr>
<td>12&quot;</td>
<td>1,292</td>
<td>$2.00</td>
<td>$.80</td>
</tr>
<tr>
<td>18&quot;</td>
<td>556</td>
<td>2.50</td>
<td>1.00</td>
</tr>
<tr>
<td>24&quot;</td>
<td>300</td>
<td>3.50</td>
<td>1.20</td>
</tr>
<tr>
<td>30&quot;</td>
<td>682</td>
<td>5.00</td>
<td>1.30</td>
</tr>
</tbody>
</table>

16.8 miles in Santa Clara county, between San Felipe and eastern boundary. Rhodes & Price, successful bidders.

These jobs ran from $150,000 to $400,000 each, and many contractors bid on each of them. The figures of the successful bidders may therefore be considered fairly indicative.

Union Workmen to Be Penalized

The Associated General Contractors of America, The American Institute of Architects, The Engineering Council, The National Building Trades Employers' Association, and the Building Trades Department of the American Federation of Labor, through the National Board for Jurisdictional Awards, which recently concluded its regular quarterly meeting in Washington, have reached a national agreement through a resolution heavily penalizing union workmen who refuse to abide by the decisions of the board.

The resolution provides that local building trade councils of union labor shall suspend unions and refuse to recognize or support those unions which decline to abide by decisions of the National Board; it also provides that general contractors and sub-contractors who employ only union labor shall incorporate in their agreements with labor a provision that will secure compliance with all the decisions of the board, and that they shall refuse employment to members of local unions which do not abide by such decisions, and further, that architects and engineers shall insert in all their specifications and contracts a clause that such decisions shall be followed.

This resolution is of far-reaching consequence to settle these jurisdictional disputes, which in the past have constituted the majority of the causes for strikes and resulting delays and economic losses.

It is the most effective co-operation between workmen, employers and professional men interested in construction looking toward the settlement of these jurisdictional disputes without resort to strikes.

This action has been taken as the result of the report of a special committee of the National Board appointed to outline the procedure to be followed in clearing up the situation created by the refusal of the United Brotherhood of Carpenters and Joiners to conform to the decisions of the board in the case of settling the dispute between the carpenters and the sheetmetal workers which was decided in favor of the latter. This dispute involved the setting of sheetmetal trim on doors and windows. The carpenters have refused to abide by the decisions and have called strikes and suspended work on big construction jobs in many parts of the country, causing serious trouble and unemployment in other trades.

The resolution follows:

Whereas, The United Brotherhood of Carpenters and Joiners of America has not been observing or conforming to the decisions of the National Board of Jurisdictional Awards in the building industry; and
A charming bit of renaissance in which the light-colored, smooth brick admirably harmonize with the terra cotta trim, producing an effect of clean and simple elegance. The pattern work in the attic story is delightfully designed and treated.

THE Bohemian Club Entrance is one of the thirty-two subjects illustrated in our Portfolio of Architectural Details in Brickwork, a collection of file-size, de luxe half-tone plates, assembled in an enclosed folder, with printed tab, ready for filing.

These examples show a wide variety of artistic effects, in both interior and exterior subjects, that can be economically obtained by the use of standard brick. Where special brick are wanted we suggest that the architect lay out the wall so that the special forms may be made from standard sizes. In this way he will secure the effect he desires at the least expense.

The Portfolio of Architectural Details in Brickwork will be added to from time to time, with further examples, with data on brick and its uses, and with monographs on the treatment of the mortar joint in connection with the blending of the brick color tones.

The portfolio will be sent to any architect requesting it on his office stationery, and his name will be placed on the list for future mailings.

AMERICAN FACE BRICK ASSOCIATION
1159 WESTMINSTER BUILDING • CHICAGO, ILLINOIS
Principles of the Associated General Contractors of America

The following postulations introduce the program's main objectives:

A principle is a standard by which men live.

A program is the means of putting a principle into effect.

A principle without a program is a platitude.

Co-operation is the standard that gives life to associations of men. Is it a blithering platitude, or is it an effective principle?

There is just one test: has it an effective program?

The Present Program of the Associated General Contractors of America includes the following main objectives:

Co-operate with Associations of Engineers, Architects, Manufacturers, Dealers, Bankers, Realtors, Sub-contractors, and Workmen in the solution of common problems.

Maintain the National Board for Jurisdictional Awards in the Building Industry.

Organize a National Conference Board for the Building Industry representing contractors, workmen, architects, engineers, and owners to consider working conditions, establish national standards, remove restrictions, and eliminate strikes.

Promote the organization of official and voluntary Boards of Arbitration of disputes.

Put in operation the procedure for Payment for Estimating and Quantity Survey, recommended by the joint report of A. G. C., American Engineers Council, and American Institute of Architects.

Formulate Standard Estimating Forms for builders and highway contractors.

Develop a System of Money Accounting for contractors.

Standardize Construction Cost Accounting Practices, such as equipment rental schedules.

Secure necessary amendments to existing Standard Contract Forms and formulate others as needed, for use between Contractor and (a) Owner, on lump sum, unit price, cost plus work in building, highway, railroad, and public work construction; between Contractor and (b) Subcontractor, (c) Material Manufacturer, and (d) Equipment Manufacturer.

Revise, systematize and standardize Compensation Insurance Classification and Rates.

A. QUANDT & SONS

ESTABLISHED 1880

PAINTERS AND DECORATORS

S A N F R A N C I S C O

L O S A N G E L E S

Office and Shop
374 Guerrero Street
San Francisco
Phone Market 1709
You would accept a certified check

WHEN you buy a stove, a washing machine, a refrigerator or other household article, and it is stamped with the maker's name and in addition has the Armco triangle, you know it is as good as a signed, certified check.

The Armco triangle appears only on articles of full value, of more than ordinary merit. Manufacturers couldn't afford to use "Armco" Ingot Iron in cheap articles.

This pure iron resists rust. Because of its especially prepared surface it takes a coat of enameling with a rich gloss that is beautiful in appearance, easy to keep clean, and which has no tendency to crack or chip. Galvanizing holds to "Armco" Ingot Iron—or it is more true to say that the galvanizing and the pure iron base become as one.

Whenever you buy a stove, a washing machine, a refrigerator, or other household utility, ask the salesman to let you see the Armco trademark. It is certifying our signature to the "check."

THE AMERICAN ROLLING MILL CO.
MIDDLETOWN, OHIO

An ample supply of ARMCO stock is carried in the San Francisco warehouse, Tenth and Bryant streets. Other branch offices in New York, Pittsburg, Cleveland, Detroit, St. Louis, Cincinnati, Atlanta, Washington and Buffalo.

When writing to Advertisers please mention this magazine.
Develop the Contractors' Service Corporation as a service bureau representing contractors on insurance rates, coverage, and service; establish local branches.

Secure passage of National Legislation, as follows:

Navy, War, Treasury Contractors' Relief Bills,
Department of Public Works Bill,
A Scientific Selective Immigration Law, Adequate, Federal Aid for Highways,
An effective Water-power Development Act,
Proper Railroad Regulation including:
(a) Maintenance of private ownership,
(b) curtailment of Interstate Commerce Commission's arbitrary power to grant priorities, (c) modification of wartime freight rates on construction materials,
(d) adequate support of railroad expansion.

Standardization of Government Contracts, Jt. Res.
Secure an Open Wholesale Market in materials
Urge Fall Lettings of highway and public works contracts.
Seek the Standardization of Building Codes.
Encourage Associations of General Contractors in the solution of problems of mutual interest.
Maintain a Research Division for the study of contractors' problems.
Give accurate Information and Statistics on construction through regular publications, bulletins, and pamphlets.

Neglect of Concrete Mixers Is Costly

Mixers manufacturers report that only one of five paving mixers returned at the season's end to be overhauled shows that it has had reasonable care in the operation and maintenance. Engineering News-Record says that these figures tally closely with field observations of numerous paving mixers in operation, and adds that besides indicating poor business sense, these conditions speak poorly for the technical proficiency of highway contractors. Obviously if contracting is to maintain successfully its claim to expert skill in constructing, it should be made clear by the workmanlike manner in which contractors operate and maintain expensive machines for construction. The mechanism of a paving mixer is not only extensive but it is correlated so that the various operations will co-ordinate almost perfectly. It needs but a moment's thought to realize that a machine process which by half a score of operations, takes a container of raw materials from a car or truck and places them as mixed concrete on the subgrade inside of two minutes and often in a minute and a half, with one minute of the time consumed in mixing, requires precise operation and has to be tuned up to a high pitch of mechanical efficiency.

Book Reviews

Edited by AUGUST G. HEADMAN, Architect

COLLECTED PAPERS ON ACOUSTICS—By

Friends and colleagues of the late Wallace Clement Sabine, former professor of mathematical and natural philosophy, Harvard University, have made possible the publication of "Collected Papers on Acoustics" and have succeeded in giving this book a presentation that not only is suited to its readers but also as a memorial to the late Professor Sabine. This book presents the life work of a great and world-known Harvard scholar, whose career was unfortunately ended by overwork during the recent war.

From a reader's viewpoint this book is one of the best purchases of the year, the selling price being ridiculously low, considering the valuable data the volume contains.

PRACTICAL STRUCTURAL DESIGN—By
Ernest McCullough, C. E. Published by the

A book written principally for the practical office and field man with a limited knowledge of mathematics, but also of equal service and value to the advanced engineer.

The author, Ernest McCullough, C. E., member of the American Society of Civil Engineers and formerly a teacher of men engaged in the offices of architects, engineers and contractors, presents in his book an analysis of many serious complicated structural problems in a simplified, concise and interesting way.

The subject matter is up to date, direct to the point and representative of usual modern practice.

VISUAL ILLUSIONS, Their Causes, Characteristics, and Applications—By
M. Lackies. Published by D. Van Nostrand Company, 8 Warren street, New York City.

This book is broad in its scope and will be helpful to the general reader, to artists, decorators, sculptors, architects, experts in lighting, and all others interested in light, color, and vision in general.

The book places under one cover many facts on visual illustrations that would require months of research to gather for those so interested. The interesting illustrations show up the defective accuracy of our visual powers and leave the mind in a state of confusion.

AMERICAN ARCHITECTURE

The praises of American architects, whose work he describes as a "new art in the truest sense of the word," are sung by George Wybo, a young French architect, in the columns of the Intransigeant, a Paris paper in favor of natural philosophy.

The old skyscrapers of New York, he says, "are not always the happiest exam-
"—a typical example of how we can serve you"

In the new Hughson Building, important materials such as Red Pressed Brick and Atlas White Cement, for the exterior, and Lapidolith, a hardener for the concrete floors, were all supplied by UNITED MATERIALS COMPANY.

—and that service consists not alone in furnishing the architect and builder with the highest type and widest choice of building materials. More than that, our many successful years of experience in all classes of construction—industrial, residential and institutional—have equipped us to render the most intelligent advice and cooperation in the selection and application of those materials.

Would you care to see an actual sample, made according to your specifications, of a panel for your proposed office structure, or various colors and designs of roofing tile for that handsome residence you are planning?

Avoid the inconvenience and uncertainty of "shopping" indiscriminately for such assistance as you may require. Construction engineers, accustomed to consulting with us on a wide variety of detail, have found our concentration of materials and service invaluable.

We shall be glad to extend you our cooperation at your request.

UNITED MATERIALS COMPANY
Sharon Building
SAN FRANCISCO

REPRESENTING
RICHMOND PRESSED BRICK CO. LOS ANGELES PRESSED BRICK CO.

When writing to Advertisers please mention this magazine.
bles of architectural conception," but the newer office buildings erected within the last ten or fifteen years are described as "impeccable in execution, well proportioned, possessing harmonious lines, with decorative elements of sober taste, constructed of splendid materials finely fashioned."

The sight of these buildings causes the Frenchman to recognize the existence of a new art "in the truest sense of the word, an art capable of making us feel strong emotions similar to those awakened within us by the power and splendor of our cathedrals and certain monuments of the past in Europe."

Referring to the "tremendous temples of commerce," M. Wybo says, "all these buildings are different from one another, but each in its own style, in its construction, form and architectural lines isundeniably a masterpiece."

**American Art Students to Study in France and Spain**

On the 11th of May a colony of enthusiastic students will sail from New York to pursue a course of art study in France and Spain, returning from there to America in the latter part of October. Their travels will take them into the most picturesque sections of Brittany in France, where they will sketch the wonderful and colorful landscape and have for their models the quaintly clad peasant folk.

From France their journey will be into Spain, crossing over the rugged ranges of the Pyrenees, down through that little known country of the Basque, visiting Burgos, with its wonderful great cathedral; also Segovia, and other historic places, and resting at Madrid for a season to enable those who care for an opportunity to study and copy the works of the great Spanish masters, Velasquez, Goya and El Greco. After exploring Madrid and its picturesque nearby cities, such as Toledo and Salamanca, the class will go to the coast and remain through the hot weather, at either Valencia, Alicante, or Maliga.

They will also spend several profitable weeks in Seville and Granada, where they will paint from the Spanish models and the alluring architectural scenery.

From Spain they will cross over into Morocco, in Africa, and remain there until the time of their departure. They will sail from Gibraltar for New York at the end of six months.

These art students will be under the guidance and instruction of Mr. George Elmer Browne, whose reputation as a teacher is bringing students from all over the United States. Mr. Browne is well known in Paris, where he resided for nearly sixteen years. He has conducted the West End School of Art, at Provincetown, Mass., for the past eight years, and is taking this class to Europe this year through the urgent request of his former students. His paintings are to be seen in many of the most prominent art museums in this country, including the National Gallery at Washington, the Chicago Art Institute and many others.

**A Steel Basement Window**

Architects, contractors and builders in general will be interested in a new basement window in steel now being marketed for use in residences, stores and apartments.

A number of advantages are claimed for the new window, which is designed to take the place of wood windows, and which is being sold through dealers at prices which bring the cost to the building owner as low or lower than wood.

The chief argument advanced in favor of the steel window is that it admits 40 to 50 per cent more light for the same sized opening. This extra illumination is secured through the use of narrow solid rolled steel bars in both frame and sash, thus eliminating the wide wooden members and permitting the use of larger glass lights.

While the new steel window is provided with a lock already attached, it is so designed that a padlock may be used in place of the one provided. This would prevent burglars from cracking out a pane of glass near the lock and opening the window by reaching in.

The new window comes already assembled. There is no planing, fitting nor hanging of sash to fit the frame. The ventilator is removable, being hung at the top by two hinge pins on the inside of the frame. By merely removing these pins, the ventilator may be taken out and sent away to be glazed. If at any time a pane of glass is broken, the owner can remove the pins and lay the ventilator across his bench and glaze it at his leisure and in perfect comfort.

**New Type Oil Pump**

S. F. Bowser & Company, manufacturers and distributors of oil pumps, have just placed on the market an improved pump which, aside from its wonderful efficiency and other qualities, is an interesting example of how a manufacturer can adapt his own time-proven principles and ideals of manufacture to certain wishes and demands of the consuming public without, in any manner, taking away from the strength of his product.

It is said that this pump actually permits the public to gratify a natural desire to see what one is getting, without making it pay for that privilege (the value of which is, after all, problematical) by risking safety to life and property or losing time or money in service.

It is being shown at all the important automobile shows throughout the country.
Specify bare copper wire in your Electrical Specifications?
Of course not.

Our specifications call for good rubber insulated wire that will give protection against fire and accident. And, as further safeguard, protective metal conduits are provided for them.

But, how about the most vital part of your Electrical Installations?
The point of Control.—The Switchboard, or Switch?
There is where the greatest danger lurks, and there is where maximum Safety and Protection is necessary. It is the point of necessary contact by the operator and where flashes and arcing occur in the control of the electrical circuits.

Unit Safety Switchboards and Switches
are specially designed to give maximum protection. Their steel clad fire-proof design embody besides the pre-requisite elements of safety, structural features of merit worthy of the investigation of particular Architects and Engineers.—They are neat, compact and efficient, and are built in designs to meet all requirements.

“UNIT” is to the switchboard and switch what rubber insulation and conduit are to the copper wire. Both eliminate accident and fire hazards and reduce insurance cost. Worthy investments.

Our specialized engineering service
is at your disposal

UNIT ELECTRIC COMPANY
450-460 NATOMA ST. SAN FRANCISCO, CAL.
Yes, this is it—

The

D.F. Push Button Panel Board

Illustration shows how the board looks with center door alone open, giving access to the Push Button compartment only.

Next month we will show the door and trim, complete.

D.F. Push Button Panel Boards are installed in many large theatres and public buildings, including the new Granada, San Francisco's most beautiful motion picture palace.


Safety Electric Company
Samuel H. Taylor, Proprietor

59 Columbia Square
San Francisco

Edw. R. Bacon Company Sales Convention

The Edw. R. Bacon Company second annual sales convention was held at San Francisco, February 17 and 18, the event this year being dignified with the publication of an elaborate program booklet entitled "Bringing Home the Bacon." This program also contained the menus for two dinners, one at Marquard's cafe and the other at Tait's. The attendance included the officers of the company, heads of the branches at Los Angeles, Sacramento and Fresno, and managers of the various sales divisions, numbering sixteen, together with the salesmen and office employees of the several branches.

On the title page of the program appears the following tribute to the head of the company, entitled "Bacon":

May our glasses ring; may our eyes grow dim.
For here is a man who fights to win:
His men are faithful, his heart is just.
Let's give him a hand this night, or bust.

This verse was followed on the next page by a paragraph elaborating the spirit of co-operation and loyalty distinguishing the organization. It reads:

"As we gather here amid the glow of good fellowship, we have reason to be proud of such an assembly. One year ago we were called together to get acquainted, exchange opinions, discuss new policies, and in general to better fit ourselves for the task before us. That was yesterday. Today we are better acquainted. We find we are more than comrades, we are partners! We are working for one another and in so doing we are not only benefitting ourselves, but are building up an organization that will stand as a monument to us after we are gone. How much more could a living mortal expect, or desire to accomplish in life? Our chief, who has made it possible, must not be forgotten. We have had as a pilot a man whom we have all learned to admire, whose judgment, enthusiasm, energy, and rock-blasting determination has made for him a place in the hearts of his partners, employees and fellowmen, that may justly be envied by any commander of industry."

Zoning Ordinance for Bakersfield

The Bakersfield City Planning Commission has voted to ask the City Council for an appropriation of $2500 for city planning work, as the result of a conference with Mr. Charles H. Cheney, city planning expert. If the council appropriates the money Mr. Cheney will be employed to draft a zoning ordinance for the city.

When writing to Advertisers please mention this magazine.
Modern architecture is as much a matter of solving practical problems and meeting economic requirements as it is an expression of artistic values.

In all these phases the architect of today looks ahead at the same time that he reinforces his vision and judgment with the lessons of his predecessors.

Historic training tells him that the ancient Assyrians, the Greeks, the Romans and the later Renaissance Italians found Terra Cotta a ready medium for the expression of artistic values.

And looking back but a decade or two, the architect perceives that our earlier office buildings of fifteen stories or more made use of Terra Cotta—the material most effectively combining lightness with crushing resistance and fireproof qualities.

The Crocker Building, for instance, has stood thirty years,—through a disastrous fire. It remains in perfect condition.
Coloring Concrete
By A CEMENT WORKER

You can not use paints or stains, but must use a pure mineral cement color that is free from clay, gypsum and organic matter.

I recommend the use of an average of 5 lbs. of color to every bag of cement, with the exception of green, in which instance use 7 lbs., and in the case of black use 2 lbs. in 1 to 2½ mix.

Also the following formula which I am sure will be both satisfactory and durable. The colors will not fade if the directions are closely followed. These recipes were given me some years ago, and I find that wherever tried, they have proved to be all that was expected of them. The quantities given are per barrel of cement, the coloring matter in each instance being mixed dry with cement and sand. Caution is given that venetian red and common lampblack should not be used, as the color obtained with these materials will run and fade. The various colors and quantities of coloring materials for each barrel of cement are as follows:

For brown, 25 lbs. of best roasted iron; or 15 lbs. to 20 lbs. of brown ochre.
For black, 45 lbs. of manganese dioxide.
For buff, 15 lbs. of ochre. (This is likely to considerably reduce the strength of the mixture.)
For green, 23 lbs. of greenish-blue ultramarine.
For gray, 2 lbs. of boneblack.
For red, 22 lbs. of raw iron oxide.
For bright red, 22 lbs. of Pompeian or bright vermillion.

In using coloring matter with concrete, the color should always be mixed with the cement dry, before any sand or water is added. The mixing should be thorough, thereby insuring uniform color.

Memorial Buildings

Architect George Gove of Tacoma, has been commissioned to draw plans for the Memorial to be erected to the memory of ex-service men at Shelton, Washington. It has not yet been decided just how much the structure will cost.

Architects Hill, Mock & Griffin of Tacoma, are preparing plans for a Memorial Hall at Centralia, to be erected to the memory of service men who were shot on Armistice day in 1919. The building is to be 135 feet across the front and 130 feet deep, and will cost $250,000.


Its 80 pages contain standard dimension tables, architectural details, specifications and more than 20 pages of illustrations. Engineers, architects and contractors declare it to be one of the most practical and handy reference books ever printed on steel windows.

When writing to Advertisers please mention this magazine.
A faucet that will deliver hot, mixed or cold water.

Installed in the kitchen sink, this popular Quaker fixture supplants the customary two separate faucets.

*It lightens work and saves time*

Haines, Jones & Badbury Co.
Makers of Plumbing Supplies
857-859 Folsom Street, San Francisco
Philadelphia-New York-Richmond, Va-Savannah
Jacksonville-Charlotte

When writing to Advertisers please mention this magazine.
ARE you in the market for WIRE NAILS?
It will pay you to submit your specifications to us.
We are carrying a large warehouse stock and can quote for mill shipment.
Inquiries will receive prompt attention

EDW. L. SOULE CO.
RIALTO BUILDING
SAN FRANCISCO

JOHN TRAYNOR
CHARLES HARCOURT

CEAN SHORE IRON WORKS

Manufacturers of Boilers, Steel Tanks, Steel Plate Specialties.
Dealers in Boilers, Tanks, Pumps, Engines, General Machinery, Etc.

Office and Works:
550-558 EIGHTH STREET
Phones Market 462 and 463
SAN FRANCISCO, CAL.

The DUNHAM HEATING SERVICE

3 Tested Systems
The Dunham Home Heating System
The Dunham Return Heating System
The Dunham Vacuum System

Each of the above is a complete two-pipe system, made efficient by use of the Dunham Radiator Trap.

Full particulars of any of these systems on request.

C. A. DUNHAM COMPANY
Los Angeles San Francisco Seattle
Portland Spokane
Administrative and General Offices: Chicago, Ill.

SERVICE TESTING
INSPECTION
CONSULTATION
PRODUCTION

Structural and Engineering Materials

Robert W. Hunt & Co.
Engineers
Chemical and Physical Testing Laboratories

New York Chicago Pittsburgh
St. Louis San Francisco Mexico City
London Montreal

When writing to Advertisers please mention this magazine.
“Very Satisfactory”—

WHEN Mr. Weeks specified "Wolverine Brand" of Maple Flooring for the new Lincoln Civic Auditorium he showed his confidence in the superior qualities of a recognized high grade brand of flooring. Could you ask for any better recommendation of a hardwood floor from the architect?

STRABLE HARDWOOD CO.

First Street, between Washington and Clay
OAKLAND, CALIFORNIA

When writing to Advertisers please mention this magazine.
Thomas Day Co.
Lighting Fixtures
SAN FRANCISCO
725 MISSION STREET
Douglas 1573
LOS ANGELES, 209-10 BROCKMAN BLDG.

An Ornament to any Street or Playground
This beautiful vitreous China pedestal—the Haws' (model 12)
Sanitary Drinking Fountain
Send for Catalog
Haws Sanitary Drinking Faucet Co., Inc.
1808 Harmon Street, Berkeley

It Beautifies
Bay State Brick and Cement Coating truly expresses the architect's ideas of beauty for cement and stucco buildings.

It waterproofs all walls of brick, cement, and stucco. It is a permanent seal against dampness and rain. Many leading architects specify it. Write today for samples in white and colors, and booklet No. 43.

WADSWORTH, HOWLAND & CO., Inc.
Paint and Varnish Manufacturers
Boston, Mass.

JAMES HAMBLY & SON
304 Crocker St. 268 Market St.
Los Angeles  San Francisco

BAY STATE
Brick and Cement Coating

ROBERTS MFG. CO.
Lighting Fixtures
Electric Appliances
Incandescent Lamps

WILLYS FARM LIGHTING
AND POWER PLANTS

663 Mission St., San Francisco

When writing to Advertisers please mention this magazine.
THE first Architectural Terra Cotta produced in the Southwest was made in this plant. Today, the Tropico Potteries are known to architects, engineers and builders throughout the West for the excellence of their architectural terra cotta, faience or mantel tiles, vitrified clay pipe, red and buff quarry tiles, terra cotta pipe and flue lining. Future announcements will deal with these quality products.

We are always ready to cooperate with those interested, and our constant endeavor is to give permanent satisfaction at a moderate cost.

ADDRESS
TROPICO POTTERIES, INC.
GLENDALE, CALIFORNIA

Valves for every purpose in the
Kennedy Valve Book

—a practical reference book for all valve users; convenient in size and arrangement. More than 500 different types and sizes are described and listed—a range that covers all usual requirements. If you use valves, you should have the Kennedy Valve Book—it explains the principles of modern valve design, points out the features of construction necessary to assure satisfactory valve service, helps to make an exactly suitable selection for your particular purposes, and gives practical suggestions for the proper installation and care of valves.

The Kennedy Valve
Mfg. Co, Elmina, N.Y.

Branches and Supply Depots:
BOSTON, 47 India Street
NEW YORK, 95 John Street
SAN FRANCISCO, 23-25 Minna Street
CHICAGO, 204-8 N. Jefferson Street

Sales Offices:
Philadelphia, Salt Lake City, Seattle, El Paso

CALIFORNIA GRANITE COMPANY
STONE CONTRACTORS
Phone Sutter 2646
Builders' Exchange, San Francisco
Quarries, Rocklin and Porterville
Main Office, Rocklin, Placer Co., Cal.
Telephone Main 82

LAWTON & VEZEY
CONTRACTORS AND BUILDERS
332 CALL BUILDING
SAN FRANCISCO

CHAS. STOCKHOLM & SONS
GENERAL CONTRACTORS
849 MONADNOCK BUILDING Phone DOUGLAS 4657 SAN FRANCISCO

HOT WATER ELECTRICALLY
ALL YOU WANT
ALL THE TIME
THERM-ELECT WATER HEATER for APARTMENT HOUSES,
RESIDENCES, ETC.
ELECTRIC SALES SERVICE COMPANY
2512 Sixth Street, BERKELEY
Phone Berkeley 3070

JOHN M. BARTLETT
GENERAL CONTRACTOR
Office Phone Lakeside 6750
357 - 12th St., OAKLAND Res. Phone Berkeley 6884W

LARSEN-SIEGRIST CO., Inc.
BUILDING CONSTRUCTION
807 Claus Spreckels Building SAN FRANCISCO

Shop and Compare—that's the only true test
of values.
Furnishings for the home of distinctive style are
featured in this shop at prices that will bear the
strictest comparison.
Furniture Draperies Floor Coverings Interior Decorations

L. J. RUEGG
RUEGG BROS.
CONTRACTORS AND BUILDERS
Phone Douglas 1599
719 Pacific Building, SAN FRANCISCO
A
DVERTISERS in The Architect and Engineer have an advantage over non-advertisers in that they know what's going on in the building line long before the information becomes a matter of public record.

The live contractor or material man wants to know about a new building when it is being planned—not when it is part way up.

Close cooperation with leading architects and engineers throughout the Pacific Coast enables the publishers of The Architect and Engineer to furnish their advertisers with a superior Building Report Service that is positively first-hand information—concise, reliable, accurate.

_Trial Set of Reports Free on Request_

The Architect and Engineer, Inc.

627 Foxcroft Building
San Francisco

Phone Douglas 1828
Cabot's
Old Virginia White

A Soft, Brilliant White for Shingles, Siding and Similar Woodwork. As Bright and Clean as New Whitewash, and as Lasting as Paint.

Architects and others have tried for years to get a paint that would give the same beautiful, brilliant white as new whitewash, and would also be durable and clean and not rub off like whitewash. But paint was always "painty" — hard, cold and heavy. Old Virginia White is a shingle-stain compound that has solved the problem. It is as clean, cool and brilliant as fresh whitewash, and as lasting as paint; but it is not messy like whitewash, nor painty like paint, although it costs less and goes farther than paint.

Send for Sample Shingle and Circular showing other fine houses finished with Old Virginia White


Cabot's Creosote Stains, Stucco and Brick Stains, "Quilt," Mortar Colors, Damp proofing, Waterproofings, Conservo Wood Preservative, etc.

Pacific Materials Co., San Francisco  S. W. R. Dally, Seattle
Theo. F. Snyder, San Diego, Cal.

Bungalows

The Book on Request
Marshall & Stearns Co.
1152 Phelan Bldg., San Francisco
A Lesson in Economy

After the failure of the original wheel hangers

Reliance-Grant Ball-Bearing Elevator Door Hangers

were placed in the following buildings:

- Wells Fargo National Bank Bldg. San Francisco
- Orient Bldg. San Francisco
- First Natl. Bank Bldg., San Francisco
- Wiltshire Hotel San Francisco
- I. Magnin Bros., San Francisco
- Guenther & Mattern Bldg. San Francisco
- Kohl Bldg. San Francisco
- Realty Syndicate Bldg. Oakland

In all of these cases the saving of a few dollars in the cost of the original installation by the use of an inferior product proved in the end to have been a loss.

Manufactured by

Reliance-Grant Elevator Equipment Corporation

Park Avenue and 40th Street, New York

PACIFIC COAST AGENTS

Waterhouse-Wilcox Co. San Francisco and Los Angeles, Cal.
Columbia Wire & Iron Works Portland, Ore.
D. E. Fryer & Company Seattle, Spokane, Tacoma, Wash., & Great Falls, Mont.

Look for this Trademark K

And if it's there don't worry any more about your Valves and Fittings

Specify and insist upon having

The Kelly & Jones Co. Valves and Fittings
Byers Genuine Wrought Iron Pipe
Republic Steel Pipe

Complete Line of Plumbing Supplies
Large Stocks for Prompt Delivery
Catalogue on request

California Steam & Plumbing Supply Co.
671-679 Fifth Street, Corner Bluxome
SAN FRANCISCO, CALIFORNIA

When writing to Advertisers please mention this magazine.
THE TORMEY CO.

General Painters

Phone Franklin 5-5-9-8

1042 Larkin St., San Francisco, Cal.

Alvaline, Cementoline
and other
Jones-Duncan Products

MAGNER BROTHERS
PAINT MAKERS

Telephone: Market 113
414-424 Ninth St. San Francisco

HEATING=PLUMBING

COMPLETE PLUMBING AND HEATING SYSTEMS INSTALLED IN ALL CLASSES OF BUILDINGS ALSO POWER PLANTS

GILLEY-SCHMID CO., Inc.
198 OTIS STREET, SAN FRANCISCO.
Tel. MARKET 965

"BLAZING" THE TRAIL
We've been doing it for many years—giving the Sportsman Better Value for Quality than he ever before received. "Value at a Fair Price" in everything for the Sportsman.

BEAVER BLACKBOARD
BEAVER GREENBOARD

SCHOOL FURNITURE AND SUPPLIES—
OFFICE, BANK AND COURTHOUSE FURNITURE—
THEATRE AND AUDITORIUM SEATING

Rucker-Fuller Desk Co.
677 Mission St., SAN FRANCISCO, CAL.
434 Higgins Bldg., LOS ANGELES, CAL.
432 - 14th Street - OAKLAND, CAL.

Pittsburg

It Insures Instant Hot Water Service

PITTSBURG WATER HEATER COMPANY
478 Sutter St., San Francisco
Phone Sutter 5025

RUSSWIN

BUILDERS' HARDWARE

JOOST BROS., Inc.
SAN FRANCISCO AGENTS.
We Carry Complete Stock:
Fishing Tackle—Guns—Mechanics' Tools—
Paints—Crockery and Glassware—Stoves—
Household Goods. Telephone Market 891.

NO BRANCH STORE
Mazda Lamps Electric Goods

When writing to Advertisers please mention this magazine.
This TRADE MARK means much to the conscientious Architect and Builder

It is a guarantee that the client will be satisfied

HOLBROOK, MERRILL & STETSON
HIGH-GRADE PLUMBING FIXTURES

64 Sutter Street
San Francisco

Victory-Forster Closet Connection

Each Fitting Consists of
- Brass Floor Flange
- Iron Bend or Stub
- with Testing Cap in Flange and Bolts

Victory Manufacturing Co.
San Francisco, Calif.

Approved by Boards of Health of Leading Cities

Sold by All Plumbing Jobbers
COLLMAN AND SPEIDEL
GENERAL CONTRACTING
Telephone SUTTER 4858

I. R. KISSEL
Decorator, Painter and Paperhanger
1747 SACRAMENTO ST., Bet. Polk St. and Van Ness Ave., SAN FRANCISCO

ROBERT TROST
General Building Contractor
We Specialize in High Grade Work and Employ Skilled Labor in every Branch of the Building Industry.

P. A. PALMER
Contracting Engineer
782-796 Monadnock Building

FONTANELLA & TEZA
General Contractors
Telephone West 1285

MONSON BROS.
Building Construction
Yard Mariposa and Bryant Streets
Phone Market 2693

UNIT CONSTRUCTION COMPANY
(INCORPORATED)
ENGINEERING AND CONSTRUCTION
Telephone Kearny 28

J. D. HANNAH
Contractor and Builder
OFFICE: 142 Sansome Street
San Francisco, Cal.

A. D. COLLMAN
P. F. SPEIDEL

P. A. PALMER

MARK TEZA, Phone Valencia 1623

UNIT CONSTRUCTION COMPANY
(INCORPORATED)
ENGINEERING AND CONSTRUCTION

J. D. HANNAH
Contractor and Builder
OFFICE: 142 Sansome Street
San Francisco, Cal.

BUILDERS EXCHANGE, 180 JESSIE STREET
We wish to announce that the

Tiltz Engineering & Equipment Co.

are still the authorized representatives of the

Ilg Electric Ventilating Co.

Let us show you how to correctly apply high class ventilating apparatus.

San Francisco
479 Monadnock Building
Phone Sutter 2548

Los Angeles
512 Wright & Callender Bldg
Phone Automatic 66464

Advise your clients to purchase their Rugs and Carpets from us.

They will thank you for the advice.

Our rugs and carpets are of the very best quality, and our prices are guaranteed to be the lowest in San Francisco.

EDW. J. MARGETT, Wholesale Jobber

61 Ellis Street, San Francisco
Phone Douglas 2253
Opposite Century Theatre

When writing to Advertisers please mention this magazine.
Standard Fence Co.

WIRE AND IRON WORKS

WIRE GRILL WORK—WIRE SCREEN
FLEXIBLE WIRE CONVEYOR BELT
WIRE SPECIALTIES

320 North Los Angeles Street, Los Angeles, Cal. Phone 67168

Steel Bars

FOR CONCRETE REINFORCEMENT
Cut to Length, Fabricated, Installed

BADT-FALK & CO.

Tel. Douglas 3466

346 Call-Post Bldg., 74 New Montgomery St., San Francisco

“WORK THAT SATISFIES”

ATHERLEY BROS.

PAINTING AND DECORATING
WINDOW SHADES MADE TO ORDER

2032 Polk Street, San Francisco
Phone Prospect 83

MARTEN & FREDERICK

UNITED WORK SHOPS

Designers, Makers and Contractors of Fine Furniture, Draperies and Complete Interiors.

1374 SUTTER ST., SAN FRANCISCO

Phone FRANKLIN 689

GRIFFIN SHEET METAL WORKS

1720 H STREET FRESNO, CALIFORNIA

Heating and Ventilating Contractors

STEAM TABLES AND KITCHEN EQUIPMENT

Res. Tel. Merritt 3600

HERBERT BECKWITH

Building Construction

323 Newton Ave.
Oakland

D. ZELINSKY & SONS

PAINTERS AND DECORATORS

420 TURK STREET.

SAN FRANCISCO

CHARLES T. PHILLIPS

CONSULTING ENGINEER

PACIFIC BUILDING HEATING VENTILATION WIRING ILLUMINATION

SAN FRANCISCO
PACIFIC HEATING COMPANY

Heating, Ventilating and Sheet Metal Work
Coal, Wood, Oil and Gas Heaters to Meet all Requirements
We Repair All Makes of Heating Appliances

WORK GUARANTEED
Oakland 388 Corner Second and Grove Streets, OAKLAND, CALIF.

Atlas Heating and Ventilating Co., Inc.

ENGINEERS and CONTRACTORS
STEAM AND HOT WATER HEATING, FANS, BLOWERS, FURNACES, POWER PLANTS—SHEET METAL WORK

Phone Douglas 378
Fourth and Freelon Sts., Bet. Bryant & Brannan, SAN FRANCISCO

CLARENCE DRUCKER

LAWSON & DRUCKER

PLUMBING -- HEATING -- CONTRACTORS
450 HAYES STREET

TELEPHONE MARKET 275
SAN FRANCISCO, CAL.

HEATING VENTILATION

FLOOR AND WALL TILING

SCOTT CO., INC.
SUCCESSOR TO JOHN G. SUTTON CO.

243 MINNA STREET
SAN FRANCISCO

ALEX COLEMAN

CONTRACTING PLUMBER
706 ELLIS ST., SAN FRANCISCO
Phone FRANKLIN 1006

WM. F. WILSON COMPANY

MODERN SANITARY APPLIANCES
Special Systems of Plumbing for Residences, Hotels, Schools, Colleges, Office Buildings, Etc.

Phone Sutter 357 328-330 Mason Street, San Francisco.

W. H. PICARD

PLUMBING AND HEATING

Picard & Edwards
Heating, Ventilating and Power Plants
5656 College Ave. 5662 Keith Ave. Piedmont 7522 Oakland, Calif.

THOS. BRODIE, Plumber

TINNING, ROOFING and CHIMNEY TOPS
Automobile Service Carrying All Repairs
2119 FILLMORE STREET (near California) San Francisco
MOUNT DIABLO CEMENT
COWELL SANTA CRUZ LIME
ALL KINDS OF
BUILDING MATERIALS
HENRY COWELL LIME AND CEMENT CO.
Phone Kearny 2095
No. 2 MARKET STREET, SAN FRANCISCO

Detroit Jewel Gas Ranges
FOR HOME, RESTAURANT, HOTEL AND CLUB
We carry a Full Line of Stock Sizes
NATHAN DOHRMANN CO.
Geary and Stockton Streets, San Francisco
PARMELEE-DOHRMANN CO.
SELLING AGENTS
436-444 S. BROADWAY, LOS ANGELES

Cast Iron Stairs and Store Fronts
Bank and Office Railings, Elevator
Enclosures and Fire Escapes.
C. J. HILLARD CO., Inc.
Nineteenth and Minnesota Streets
Telephone Mission 1763
SAN FRANCISCO, CAL.

George S. MacGruer}
Robert M. Simpson  } Members of Builders Exchange

MacGruer & Simpson
CONTRACTING PLASTERERS
PLAIN AND ORNAMENTAL
Cement, Stucco and Artificial Stone
Phone Sutter 5688
266 Tehama Street, San Francisco

When writing to Advertisers please mention this magazine.
PASSENGER AND FREIGHT ELEVATORS
Made in San Francisco
Factory and Warehouse
166-180 Seventh Street    Phones: Market 1534 and 1535
SPENCER ELEVATOR COMPANY

JAS. I. KRUEGER
Manufacturers of
Vacuum and Vapor Steam Heating Materials, Power Plant, Equipment
Standard Radiator and Gate Valves, Pumps for Vacuum Systems of Heating
557-559 Pacific Building, San Francisco

RAYMOND GRANITE COMPANY, Inc.
Owning and operating at Knowles, Madera County, the largest Quarry in the world
CONTRACTORS FOR STONE WORK
Designers and Manufacturers of Exclusive Monuments and Mausoleums
Main Office and Yard: No. 1 and 3 Potrero Avenue, San Francisco, California
Also at 1330-Palmetto Street, Los Angeles

CYCLOPS IRON WORKS
ICE MAKING AND REFRIGERATING MACHINERY, TRAVELING CRANES
637-647 FOLSOM ST.
SAN FRANCISCO, CAL.

Independent Automatic Sprinkler Company
Fire Protection Engineers
Approved Devices
72 Natoma Street, San Francisco

RALSTON IRON WORKS, Inc.
STRUCTURAL STEEL
PAULY JAIL EQUIPMENT
20th and Indiana Sts.
SAN FRANCISCO
Phone Mission 5230

M. E. RYAN
Electrical Contractor and Dealer
520 Clunie Building, San Francisco
Phone Garfield 3159

FRANK PORTMAN
MILL AND CABINET WORK
Window Frames and Inside Finish A Specialty
Band Sawing, Sticking and Sand Papering
1618-20 MISSION STREET  SAN FRANCISCO
Phone Park 6204

ALL KINDS OF MOULDINGS
IN STOCK
Arden Plaster

Now available in any quantity desired for immediate delivery.

For further information call on your dealer or

A. R. Robertson
Builders' Exchange
180 Jessie St. San Francisco

Manufactured by

United States Gypsum Co.

Fire Proof Garages

Steel Frames may be made in accordance with architect's plans.

Also Portable All Steel Buildings

Manufactured by

BENSON & BENSON
San Jose, Calif.

The General Fireproofing Company

Manufacturers of Herringbone Rigid Metal Lath, Corner Bead, Self Sentering, Peds, Diamond Mesh Lath, and waterproofing materials for Concrete

Write for booklet describing, and answering every possible question you may ask concerning the use of fireproof and waterproof materials

No. 20 Beale Street
San Francisco

Telephones Douglas 6616 Piedmont 4955-W

American Mutual Liability Insurance Company
245 State Street, Boston, Mass.

is furnished by the oldest, largest, and strongest mutual casualty company in America.

Workmen’s Compensation Insurance
Employers’ Liability Insurance
Automobile Liability Insurance
Also Other Forms of Liability Insurance

Send for your copy of the booklet "30-30," which tells the whole story.


GEORGE W. LINCH, District Manager

When writing to Advertisers please mention this magazine.
POSITIVE ELECTRIC INTERLOCK: (BAR LOCK TYPE)
Prevents Elevator Accidents Occurring at the Entrance Door
Approved by National Underwriters Laboratories—Meets requirements of Elevator Safety Orders of Industrial Accident Commission, State of California
ELEVATOR SUPPLIES COMPANY, Inc. 186 FIFTH STREET, SAN FRANCISCO

Capital $2,000,000  CALIFORNIA DEPARTMENT  Surplus $2,250,000
THE FIDELITY AND CASUALTY COMPANY OF NEW YORK
Prompt Service for
BONDS AND CASUALTY INSURANCE
BALFOUR BUILDING  SAN FRANCISCO, CAL.

National Surety Company of New York
The World's Largest Surety Company  Assets over $20,000,000
Pacific Coast Department: 105 MONTGOMERY ST., SAN FRANCISCO, CAL.
Frank L. Gilbert, Vice-President  Phone, Sutter 2636

PACIFIC DEPARTMENT
Globe Indemnity Company
BONDS and CASUALTY INSURANCE for CONTRACTORS
FRANK M. HALL, formerly Robertson & Hall, Mgr.
444 California Street  Phone Sutter 2280  SAN FRANCISCO

PHONE DOUGLAS 2370
R. McLERAN & CO.
GENERAL CONTRACTORS
HEARST BUILDING  SAN FRANCISCO, CAL.

S. G. JACKSON
Building Construction
Office, 351 12th Street, Oakland  Residence, 1098 Ranleigh Way
Lakeside 6750  Lakeside 3373

ALFRED H. VOGT
GENERAL CONTRACTOR  CONCRETE CONSTRUCTION
185 Stevenson Street, San Francisco

Phone Sutter 1533

J. F. WAYNE
Phone Fillmore 1560
Wayne & Williams
Painting Contractors
1621 Eddy St., San Francisco

R. C. WILLIAMS
Phone West 4163
The Elevator Floor

whether in Office Building, Hotel or Department Store, is subjected to a great deal of wear and tear.

—SPECIFY—

INTERLOCKING RUBBER TILING

material that is sure to give satisfaction. Twenty tons installed in the Standard Oil Building, San Francisco.

New York Belting and Packing Co.

NEW YORK
San Francisco Branch 519 MISSION ST. Phone Douglas 1837
Stock on hand for immediate delivery.

Small booklet of designs mailed on request.

Heating and Ventilation

CONSULTING ENGINEERS
Mechanical Structural

Machine Design

Industrial Plant Design and Equipment

569 Monadnock Bldg.
Phone Douglas 7019
San Francisco
California

Superintendent of Construction
Specifications and Estimates
JOHN E. HAMILTON

When writing to Advertisers please mention this magazine.
MORTENSON CONSTRUCTION CO.
CONTRACTORS FOR STRUCTURAL STEEL AND IRON
H. MORTENSON, President
OFFICE AND SHOPS: CORNER 19TH AND INDIANA STREETS
PHONE: Mission 6033
SAN FRANCISCO, CAL.

JUDSON MANUFACTURING COMPANY
MAIN OFFICE:
817-821 FOLSOM STREET
TELEPHONE SUITE 6820
SAN FRANCISCO

Federal Ornamental Iron & Bronze Co.
Bank Counter Screens and Grille Work Our Specialty
Most Modern Equipment Throughout
Recent Contracts: BANK OF ITALY, FIRST NATIONAL BANK
16th Street and San Bruno Avenue, San Francisco
Phone Market 1011

S. S. HERRICK CO.
STRUCTURAL STEEL
BUILDINGS ■ BRIDGES ■ TOWERS
OFFICE:
2059 BRYANT STREET
SAN FRANCISCO, CAL.

CENTRAL IRON WORKS, Inc.
STRUCTURAL STEEL
Office 2059 BRYANT STREET
SAN FRANCISCO, CAL.

C. S. HOFFMAN
L. W. FLIEGNER
Golden Gate Iron Works
STRUCTURAL STEEL AND ORNAMENTAL IRON CONTRACTORS
Howard and 11th Streets
San Francisco

SCHRADER IRON WORKS, Inc.
STRUCTURAL STEEL CONTRACTORS
Fire Escapes, Waterproof Trap Doors, Ornamental Iron Work
1247-1249 HARRISON STREET
SAN FRANCISCO, CAL.
Telephone Market 337
THE HYLOPLATE
BLACKBOARD

SCHOOL FURNITURE
AUDITORIUM SEATING
MAPS
GLOBES
ATLASES

C.F.WEBER & CO.
985 Market Street
SAN FRANCISCO

222-224
S. Los Angeles St.
LOS ANGELES

100 W. Commercial
Row, RENO, NEV.

524 W. Washington
Street, PHOENIX, ARIZ.

BEAUTIFUL GARDEN
EFFECTS for the City
and Suburban Home

MacROIE-McLAREN CO.
Landscape Engineers
and General Nurserymen

Office
Nurseries at
141 Powell Street
Beresford,
San Francisco
San Mateo County

THE complete resources of CRANE Branches
and Exhibit Rooms the country over are at your
disposal when you need equipment for any phase of
plumbing, sanitation, heating or kindred service.
We are manufacturers of about 20,000 articles,
including valves, pipe fittings and steam specialties,
made of brass, iron, ferrosteel, cast steel and forged
steel, in all sizes, for all pressures and all purposes,
and are distributors through the trade, of pipe,
heating and plumbing materials.

CRANE CO.
Plumbing Supplies
Second and Brannan Sts.
San Francisco

Make Your CRANE Visit
Part of the Plan

When writing to Advertisers please mention this magazine.
Western Safety Switches
Manufactured by
Western Safety Man’fg. Co. Inc.
Enclosed Externally Operated Safety Switches, Knife Switches, Metal Switch and Cut Out Boxes, Safety Switch Boards
Office, 247 Minna Street SAN FRANCISCO
Telephone, Sutter 3008

Telephone DOUGLAS 2046 CHARLES FELIX BUTTE
BUTTE ELECTRICAL EQUIPMENT COMPANY
Trade Mark BEECO Registered
ELECTRICAL CONTRACTORS AND ENGINEERS
530 FOLSOM STREET SAN FRANCISCO

L. SIEBERT J. GENSLER
Drendell Electrical & Mfg. Co. Incorporated
SWITCHBOARDS, PANEL BOARDS, KNIFE SWITCHES,
CABINETS, THEATRE INSTALLATIONS,
PROTECTIVE POWER PANELS
1345-1353 Howard St., San Francisco Telephone Market 1753

MEYERS SAFETY SWITCH CO.
MANUFACTURERS OF
Enclosed Externally Operated ‘Safety’ Switches and
Electrical Sheet Metal Products
575 HOWARD ST., SAN FRANCISCO
Telephone Sutter 4213.
THE ARCHITECT AND ENGINEER

BUTTE ELECTRIC DOUGLAS 145
& MFG. CO.
ELECTRIC BANK PROTECTION SYSTEMS
WIRING FOR BUILDINGS
534 FOLSOM ST.
SAN FRANCISCO

H. S. TITTLE
CONTRACTING ELECTRICAL ENGINEER
766 FOLSOM ST., SAN FRANCISCO
Phone SUTTER 4278

To Be “Low Bidder” Not Always Our Aim.

Our most particular attention is given to prompt and skillful handling of all electrical
work of any nature with “QUALITY AND SERVICE GUARANTEED.”

Our nation-wide organization and large experience in this field assures you always of
fair estimates and absolute satisfaction.

F. E. NEWBERY ELECTRIC CO.
359 Sutter Street, San Francisco
Phone Sutter 521

San Francisco, Cal.          Oakland, Cal.          Los Angeles, Cal.

PAGE, McKENNY CO.
Electrical Engineers and Contractors
Phone Sutter 2369          589 Howard St., San Francisco, Cal.

Phone Market 2541

M. FLATLAND

GLOBE ELECTRIC WORKS
Estimates Furnished on Everything Electrical
ELECTRIC SUPPLIES
1959 Mission Street, bet. 15th and 16th
SAN FRANCISCO

Browne-Langlais Electrical Construction Co.
Agents for
ROBBINS and MYERS MOTORS   PACKARD MAZDA LAMPS
313 FIFTH STREET, SAN FRANCISCO
Telephone Douglas 976

G. WALTER SPENCER, Manager
Phone Lakeside 6750

SPENCER ELECTRIC CO.
CONTRACTING AND ENGINEERING
355 TWELFTH STREET
OAKLAND, CALIF.

Motors  Lighting Fixtures  Construction
Bought, Sold, Rented, Repaired  Manufactured  Maintenance Supplies
SPOTT ELECTRICAL CO.
16th and Clay Streets
Oakland, California
MOTT PLUMBING FIXTURES

Architects and their clients are invited to visit our Showrooms, 553-555 Mission Street, San Francisco; D. H. Gulick, Sales Agent. Los Angeles Office, 603 Central Building; J. R. Mayhew, Sales Agent.

Mott Company of California

MUELLER — BRASS GOODS

Recognized as the Standard of excellence in plumbing. It pays to use them, and other Mueller Brass Goods. The first cost is practically their last cost.

635 MISSION STREET, SAN FRANCISCO, CAL.

SPECIFY

STORM KING and AMERICAN WARM AIR FURNACES

Furnace Fittings and Repairs

Montague Range and Furnace Company
327-329 JESSIE STREET Phone Garfield 1422 826-830 MISSION STREET
SAN FRANCISCO, CALIF.

DON'T NEGLECT YOUR HEATING SYSTEM.
THE BEST IS NONE TOO GOOD!


JAMES A. NELSON
Heating and Ventilating Contractor
Phone, Garfield 1959 517-519 SIXTH ST., SAN FRANCISCO

When writing to Advertisers please mention this magazine.
OPEN HEARTH

Reinforcing Steel Bars

Square Deformed — Immediate Shipment — Cut to required lengths

PACIFIC COAST STEEL COMPANY
Sales Office, Rialto Building. SAN FRANCISCO. Phone Sutter 1564

SUNSET HICKS-JUDD PRESS
ABBOTT-BRADY PRINTING CORPORATION
San Francisco

Builders of Complete Catalogs
460 Fourth Street
Douglas 3140

We supply reprints of THE ARCHITECT AND ENGINEER advertisements for circularizing.

QUALITY PRODUCTS
Proven by the Test of Time

MORAN'S PRESERVATIVE PAINTS
Genuine Preservative Paints for Every Use. Will positively preserve iron, steel, wood, concrete, roofs, piles, poles, railroad ties and all wood or metal surfaces above or below earth or water.

A. W. CADMAN MFG. CO.
Cadman Valves.
The Plug Valve guaranteed not to bind, stick, or leak. Complete line of Power Equipment.

J. P. BELL & COMPANY
Associated Company

Commercial Export and Import Co., Inc.
Sole Representatives
Balboa Building  SAN FRANCISCO  Tel. Sutter 6833
Branches in Los Angeles, Salt Lake City, Honolulu, Australia and New Zealand

"MP CO"

LIGHT WEIGHT  VARIETY
FIREFROOF  and
EVERLASTING  DURABILITY

STONE SHINGLES

McCLENAHAN
PRODUCTS
COMPANY
INC.
112 Kearny St.  San Francisco

When writing to Advertisers please mention this magazine.
MILLER FOLDING IRONING BOARD
ELIMINATES WALL CABINET—IS INSTALLED IN KITCHEN CUPBOARD
NO PLASTER GROUNDS SAVES WALL SPACE AND LABOR
CASING OR PAINTING TIME AND MATERIAL
Exhibited and sold byjian NANNOM BROS. MFG. CO. Send for W. N. MILLER
Catalogue to 1844 Thirteenth St., Oakland

MILLWORK Manufactured and Delivered Anywhere
Plans or Lists sent us for Estimates will have Careful and Immediate Attention.
Jno. Dudfield, Pres., and Manager
DUDFIELD LUMBER CO. Joseph A. Jury, Sec’y & Mill Supt.
MAIN OFFICE, YARD AND PLANING MILL—PALO ALTO, CALIFORNIA

School and Theatre
STAGES AND EQUIPMENT
EDWIN H. FLAGG

<table>
<thead>
<tr>
<th>A. C. SCHINDLER, President.</th>
<th>CHAS. F. STAUFFACHER, Secretary</th>
</tr>
</thead>
<tbody>
<tr>
<td>THE FINK &amp; SCHINDLER CO.</td>
<td></td>
</tr>
<tr>
<td>Manufacturers of INTERIOR WOODWORK AND FIXTURES</td>
<td></td>
</tr>
<tr>
<td>BANK, OFFICE AND STORE FITTINGS</td>
<td></td>
</tr>
<tr>
<td>SPECIAL FURNITURE</td>
<td></td>
</tr>
<tr>
<td>219-223 THIRTEENTH ST.</td>
<td>SAN FRANCISCO, CAL.</td>
</tr>
<tr>
<td>Bet. Mission and Howard Sts.</td>
<td>Telephone: Market 474</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>O. BAMANN, President</th>
<th>ERNEST HELD, Vice-President</th>
</tr>
</thead>
<tbody>
<tr>
<td>HOME MANUFACTURING CO.</td>
<td></td>
</tr>
<tr>
<td>BANK, STORE AND OFFICE FITTINGS</td>
<td></td>
</tr>
<tr>
<td>FURNITURE AND HARDWOOD INTERIORS</td>
<td></td>
</tr>
<tr>
<td>CABINET WORK OF EVERY DESCRIPTION</td>
<td></td>
</tr>
<tr>
<td>543 and 545 BRANNAN ST.</td>
<td>Phone Kearny 1514</td>
</tr>
<tr>
<td>San Francisco, Cal.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>MULLEN MANUFACTURING CO.</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>BANK, STORE AND OFFICE FIXTURES—CABINET WORK OF</td>
<td></td>
</tr>
<tr>
<td>GUARANTEED QUALITY—CHURCH SEATING</td>
<td></td>
</tr>
<tr>
<td>Office and Factory:</td>
<td></td>
</tr>
<tr>
<td>Telephone Market 8692</td>
<td>64 Rausch St., Bet. 7th and 8th Sts., San Francisco</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>JAMES L. McLAUGHLIN</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>GENERAL CONTRACTOR</td>
<td></td>
</tr>
<tr>
<td>Phones Douglas 6645 - 6646</td>
<td>251 KEARNY STREET, SAN FRANCISCO</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Dolan Wrecking &amp; Construction Co.</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>(D. J. DOLAN)</td>
<td></td>
</tr>
<tr>
<td>Lumber, Lath, Nails, Shingles, Doors, Windows</td>
<td></td>
</tr>
<tr>
<td>and Plumbing Supplies, New and Second Hand</td>
<td></td>
</tr>
<tr>
<td>Phone Market 4264</td>
<td>Office and Yard, 1607-1639 MARKET ST., SAN FRANCISCO</td>
</tr>
</tbody>
</table>
United States Steel Products Co.

Rialto Bldg., San Francisco


MANUFACTURERS OF

Structural Steel for Every Purpose—Bridges, Railway and Highway—"Triangle Mesh" Wire Concrete Reinforcement—Plain and Twisted Reinforcing Bars—Plates, Shapes and Sheets of Every Description—Rails, Splice Bars, Bolts, Nuts, etc.—Wrought Pipe, Trolley Poles—Frogs, Switches and Crossings for Steam Railway and Street Railway—"Shelby" Seamless Boiler Tubes and Mechanical Tubing—"Americore" and "Globe" Rubber Covered Wire and Cables—"Reliance" Weatherproof Copper and Iron Line Wire—"American" Wire Rope, Rail Bonds, Springs, Woven Wire Fencing and Poultry Netting—Tramways, etc.

United States Steel Products Co.

OFFICES AND WAREHOUSES AT

San Francisco - Los Angeles - Portland - Seattle

When writing to Advertisers please mention this magazine.
OTIS ELEVATORS

The Architect or Engineer can specify "Otis Elevators," assured that the responsibility of the Otis Elevator Company extends beyond satisfactory installation. Buildings equipped with Otis Elevators enjoy the advantage of the prompt service and careful inspection rendered by any of our hundred offices. Such service means your clients' gratitude.

When writing to Advertisers please mention this magazine.
Beautiful simplicity characterizes — PACIFIC PLUMBING FIXTURES
A Remarkable Record of Roof Durability

Shown here are three buildings of the Mountain Copper Co., at Martinez, Calif. Each is covered with a P. & B. Roof that has given more than seventeen years of continuous service. The Fertilizer Plant was roofed in 1905—the Bluestone Building in 1905—the Boarding House in 1904, and each roof is still in excellent condition.

While this is a remarkable record for roof durability, it is not an unusual occurrence. Rather it emphasizes the exceptional quality of Pabco Products.

The same rigid standards of quality, plus the invaluable knowledge gained in more than thirty years' experience in the manufacture of roofing that has given the same unusual service in all parts of the world, are embodied in the modern and widely used

PABCO 10 and 20 year ROOFS

Write for specifications, samples and complete details

THE PARAFFINE COMPANIES, INC.

Seattle, Portland, San Francisco, Los Angeles
Clocks Were Never Needed 'Til Time Acquired a Value

Electric Clock and Program Bell Systems
Automatic Control of Time Keeping Devices
for Schools, Hospitals, Public and
Private Buildings, Banks, etc.
Automatic Calling Systems

Plans, specifications and any engineering
information, estimates, etc., cheerfully fur-
nished to architects, engineers, or any one
interested in this special line of work

Time Recorders Time Stamps

Pacific Electric Clock Co.
516 Wells Fargo Building
Telephone Sutter 803 San Francisco, Cal.

General Machinery & Supply Co.
OFFICES and STORE: 39-51 STEVENSON STREET
TELEPHONE—Private Exchange—SUTTER 6750

AGENT FOR

EVERLASTING BLOW-OFF VALVES

WM. POWELL CO'S
White Star Valves—Model Star Valves
Union Composite Disc Valves
and Pilot Gate Valves

YALE & TOWNE:—CHAIN HOISTS

FISHER AND SWARTWOUT STEAM SPECIALTIES

ENGINEERS', MACHINISTS' and STEAM FITTERS' SUPPLIES
Pipe, Pipe-Fittings, Valves, Belting, Packing and Hose

Transmission and Conveying Machinery

SEND US YOUR INQUIRIES

When writing to Advertisers please mention this magazine.
ARMSTRONG'S CORK TILE

The Working Space Floor

FURNISHED AND INSTALLED
BY
VAN FLEET-FREEAR CO.
420 SOUTH SPRING ST. 61 NEW MONTGOMERY ST.
LOS ANGELES SAN FRANCISCO

ROBERTSON Process Skylights

Made by an exclusive patented process which includes Robertson Process puttyless joints, condensation gutters and metal parts, as well as a bar beam based on approved engineering principles, strong enough to avoid deflection.

Catalogues and full information on request

ROBERTSON CO
(Formerly Asbestos Protected Metal Co.)
1007 HOBART BLDG. SAN FRANCISCO, CAL.
Telephone Garfield 322

When writing to Advertisers please mention this magazine.
MARBLE FRONTS

Give new value to the old building and make the new what it should be. They speak of stability and prosperity. They attract the kind of business that is worth having. They do away with repairs and the worry of rebuilding. Best of all they are proof against fire.

Vermont Marble Company

PROCTOR, VERNON

San Francisco

PROMETHEUS

The Electric Food and Plate Warmer

Wherever meals are cooked and served, in apartments, residences and institutions, Prometheus is a highly valued asset. The wireless heating units placed independently of the shelves keep food hot and tasty until ready to serve and cannot injure the finest china.

Write for information and list of installations

The Prometheus Electric Co.

Manufacturers

511 West 42d Street, New York

Showroom M. E. HAMMOND

Mezzanine Floor Pacific Bldg., San Francisco

DEPENDABILITY

"Since 1858"

LINOLEUMS

WINDOW SHADES

Carpets

Draperies

Rugs

Estimates furnished

D. N. & E.

Walter & Co.

562-572 Mission Street

SAN FRANCISCO

Los Angeles Portland Seattle

"Standard"

THIRTY-SIX years' experience manufacturing and installing Electric Time Keeping Systems. Helpful engineering data cheerfully furnished architects, engineers and school boards insuring satisfactory results, and a direct factory branch office completely equipped to render immediate service.

The Standard

Electric Time Company

461 Market St., San Francisco, Cal.

Telephone Sutter 241

The Architect and Engineer—APRIL, 1922—Vol. LXIX, No. 1. Published monthly—$2.50 a year.

627 Foxcroft Building, San Francisco, California. Entered as second-class matter, November 2, 1903, at the Post Office at San Francisco, California, under the act of March 3, 1879.
AS GOOD AS IT LOOKS

Will that school house, that theatre, that factory of yours be as good as it looks?
On the outside it seems everything that such a building should be; it has dignity; it looks substantial—and safe.
It is?
No doubt it is fireproof; is it also proof against loss of life and limb through panic?
Install Von Duprin Self-Releasing Fire Exit Latches and you will make safe exit certain in time of emergency.
The mere touch of hand or body on a Von Duprin instantly opens the way to safety.
Let us send you Catalog 12-L, or see “Sweet's”—pages 1212-1216.

VONNEGUT HARDWARE CO.
Indianapolis, Ind.
Pacific Rolling Mill Co.
SUPPLIERS OF
FABRICATED STRUCTURAL STEEL, Forgings
Bolts, Rivets, Frogs, Switches, Cast Iron Castings
General Office and Works
17th and MISSISSIPPI STS., SAN FRANCISCO
Telephone Market 215

Western Iron Works
STRUCTURAL IRON AND STEEL CONTRACTORS
141-147 Beale St. and 132-148 Main St.
SAN FRANCISCO
Phones: GARFIELD 2375—2376

UNION CONSTRUCTION CO.
CONTRACTORS AND ENGINEERS
Steel for
All Types of Building Construction and Bridges
All Classes of
General Machinery Tank and Pipe Work
Gold Dredges and Their Equipment
BALFOUR BLDG.
San Francisco Sutter 2790
Key Route Basin Oakland Lakeside 6300

When writing to Advertisers please mention this magazine.
ASBESTOS MATERIALS
Johns-Manville Inc., of California, 500 Post street, San Francisco.

ARCHITECTURAL MATERIALS

ARCHITECTURAL TERRA COTTA

AUTOMATIC SPRINKLERS

AUTOMOBILES
W. L. Hughson Co., Geary St., at Van Ness Ave., San Francisco.

BANK FIXTURES AND INTERIORS

BELTINC AND PACKING

BLACKBOARDS

BLINDS—VENETIAN AND DIFFUSELITE

BOILERS
California Hydraulic Engineering & Supply Co., 79-72 Fremont St., San Francisco.


BONDS FOR CONTRACTORS

BRASS GOODS, CASTINGS, ETC.

BRICK, PRESSED, COMMON, ETC.

BRICK & CEMENT COATING

BRICK STAINS

BUILDERS' HARDWARE

BUILDING MATERIALS, SUPPLIES, ETC.

GRINNELL AUTOMATIC SPRINKLER
GRINNELL COMPANY
OF THE PACIFIC

VALVES
ENGINEERS AND CONTRACTORS
453 Mission Street, San Francisco

CHIMICAL FIRE EXTINGUISHERS
and FIRE ENGINES

When writing to Advertisers please mention this magazine.
Nason's Opaque Flat Finish
A Valuable Oil Paint
For Walls, Ceilings, Etc.
Made in California to stand Pacific Coast Climatic Conditions
R. N. Nason & Co., Paint Makers
Portland
131 Potrero Ave.—San Francisco—136 Market St.
Seattle

Architects' Specification Index—Continued

Building Paper
The Paraffine Companies, Inc., San Francisco, Los Angeles, Portland and Seattle.

Cabinet Makers
Home Manufacturing Company, 543 Brannan St., San Francisco.
Fink & Schindler Co., 218-13th St., San Francisco.
Mullen Manufacturing Company, 64 Rausch St., San Francisco.

Carpet
John Breuner Co., 281 Geary St., San Francisco.
D. N. & E. Walter, Mission near Second St., San Francisco.
W. & J. Sloane, 216-228 Sutter St., San Francisco.
Edward J. Margett, 61 Ellis St., San Francisco.

Casement Window Hardware

Castings

Cement
Atlas Portland Cement Co., agencies in all principal Coast cities.
Mt. Diablo, sold by Henry Cowell Lime & Cement Co., 2 Market St., San Francisco.

Cement Exterior Waterproof Paint
Armortite, solv by W. P. Fuller & Co., all principal Coast cities.

Cement Tests—Chemical Engineers
Robert W. Hunt & Co., 251 Kearny St., San Francisco.

Clay Products
Cannon & Co., Sacramento, Cal.
Gladding, McBean & Co., Crocker Bldg., San Francisco.
Los Angeles Pressed Brick Co., Frost Bldg., Los Angeles.
Tropico Pottery, Inc., Glendale, Cal.
S. & S. Tile Company, San Jose, Calif.

Clocks—Electric Time
Pacific Electric Clock Co., 516 Wells-Fargo Bldg., San Francisco.
Standard Electric Time Co., 161 Market St., San Francisco.

Cold Storage Plants
T. P. Jarvis Crude Oil Burning Co., 275 Connecticut St., San Francisco.
Cyrolo Iron Works, 837 Folsom St., San Francisco.

Composition Floors
"Linoleum"; plastic flooring, Hill, Hubbell & Co., 115 Davis St., San Francisco; 144 San Fernando Bldg., Los Angeles.

Concrete or Cement Hardener
Gunn, Carle & Co., Inc., 441 Market St., San Francisco.

Concrete Mixers
Foot & Jaeger mixers sold by Edward R. Bacon Co., 51 Minna St., San Francisco, also Los Angeles.
Ransome mixers sold by the Garfield Co., Hearst Bldg., San Francisco.
Smith-Bath-Usher Co., San Francisco and Los Angeles.

Concrete Reinforcement
United States Steel Products Co., San Francisco, Los Angeles, Portland and Seattle.
Pacific Coast Steel Company, Rialto Bldg., San Francisco.
Trueson Steel Co., 527 Tenth St., San Francisco.
Badt-Falk Co., Call-Post Bldg., San Francisco.

Conduits
Garnett Young & Co., 612 Howard St., San Francisco.

Contractors, General
Barrett & Hilp, 918 Harrison St., San Francisco.
R. W. Littlefield, 537-12th St., Oakland.
Lawton & Vezey, Call Bldg., San Francisco.
Plaza Bldg., Oakland.
K. L. Parker Co., Inc., Clinton Bldg., San Francisco.
Unit Construction Co., Phelan Bldg., San Francisco.
J. D. Hannah, 142 Sansome St., San Francisco.

Satinette White Enamel
Flattine Cabinet Finish
Elastica Interior and Elastica Exterior

Standard Varnish Works
55 Stevenson Street
San Francisco

When writing to Advertisers please mention this magazine.
The Pneumatic Painting Machine Co.
G. H. GRENVILLE, Manager
1046 Monadnock Building, S. F.

Phone Sutter 471

ARCHITECTS' SPECIFICATION INDEX—Continued

John M. Bartlett, 327 Twelfth St., Oakland.
Chas. Stockholm & Son, Monadnock Bldg., San Francisco.
Herbert Beckwith, 323 Newton Ave., Oakland.
Collman & Speidel, 514 Monadnock Bldg., San Francisco.
Clinton Construction Company, 140 Townsend St., San Francisco.
Monson Bros., 251 Kearny St., San Francisco.
Fontanella & Teza, 1682 Eddy St., San Francisco.
Geo. Wagner, 251 Kearny St., San Francisco.
T. B. Goodwin, 180 Jessie St., San Francisco.
Robert Trost, 26th and Howard Sts., San Francisco.
I. M. Sommer, 411 Balboa Bldg., San Francisco.
Jas. L. McLaughlin, 251 Kearny St., San Francisco.
Alfred H. Vogt, 185 Stevenson St., San Francisco.
Lange and Bergstrom, Sharon Bldg., San Francisco and Washington Bldg., Los Angeles.

CONTRACTORS' EQUIPMENT
Edward E. Hareen Co., 51 Minna St., San Francisco, and Los Angeles.
Garfield & Co., Hearst Bldg., San Francisco.
Smith, Booth-Usher Co., 88 Fremont St., San Francisco; 228 Central Ave., Los Angeles.

CONVEYING MACHINERY
Mease & Gottfried, San Francisco, Los Angeles, Portland and Seattle.

CONVENIENCE OUTLETS
Harvey Hubbell, Inc., Bridgeport, Conn., represented in San Francisco by Garnett Young & Co., 612 Howard St.

CORK TILE
Van Flett-Freear Co., Sharon Bldg., San Francisco.

CRUSHED ROCK
Coast Rock & Gravel Co., Call-Post Bldg., San Francisco.

DAMP-PROOFING AND WATERPROOFING
Hill, Hubbell & Company, 115 Davis St., San Francisco.
"Paraffin" Damp-Proofing Compound, sold by the Paraffine Companies, Inc., San Francisco, Los Angeles, Portland and Seattle.

DOOR HANGERS
Stanley Works, New Britain, Conn., Monadnock Bldg., San Francisco.

DRINKING FOUNTAINS
Crane Company, San Francisco, Oakland, and Los Angeles.
Pacific Porcelain Ware Co., 67 New Montgomery St., San Francisco.
Haines, Jones & Cadbury Co., 557 Folsom St., San Francisco.

DUMB WAITERS
Spencer Elevator Company, 166-7th St., San Francisco.
San Francisco Elevator Company, Inc., 860 Folsom St., San Francisco.

ELECTRICAL CONTRACTORS
Butte Electrical Equipment Company, 530 Folsom St., San Francisco.
Butte Electric & Manufacturing Co., 534 Folsom St., San Francisco.
Brown-Langhais Electrical Construction Co., 313 5th St., San Francisco.
Central Electric Company, 185 Stevenson St., San Francisco.
Newbury Electrical Co., 359 Sutter St., San Francisco.
Pacific Fire Extinguisher Co., 421 Howard St., San Francisco.

Globe Electric Works, 1959 Mission St., San Francisco.
M. E. Ryan, Redwood City, and 520 Clunie Bldg., San Francisco.
H. S. Titth, 766 Folsom St., San Francisco.
Spencer Electric Co., 355-12th St., Oakland.

ELECTRIC PLATE WARMER
The Prometheus Electric Plate Warmer for residences, clubs, hotels, etc. Sold by M. E. Hammond, Pacific Bldg., San Francisco.

ELECTRICAL SUPPLIES AND EQUIPMENT
Garnett Young & Co., 612 Howard St., San Francisco.
Butte Electrical Equipment Co., 530 Folsom St., San Francisco.
Harvey Hubbell, Inc., Bridgeport, Conn., represented in San Francisco by Garnett Young & Co., 612 Howard St.

Telephone Garfield 294

Independent Automatic Sprinkler Company
Fire Protection Engineers
72 Natoma Street, San Francisco

Approved Devices

When writing to Advertisers please mention this magazine.
ARCHITECTS’ SPECIFICATION INDEX—Continued

Safety Electric Company, 56-65 Columbia Square, San Francisco.

ELEVATORS—Otis Elevator Company, Stockton and North Point, San Francisco.
Spencer Elevator Company, 166-7th St., San Francisco.
San Francisco Elevator Co., 860 Folsom St., San Francisco.

ENGINEERS—CONSULTING, ELECTRICAL, MECHANICAL
Chas. T. Phillips, Pacific Bldg., San Francisco.
Hunter & Hudson, Rialto Bldg., San Francisco.
Ralph E. Dodge, 251 Kearny St., San Francisco.

ELEVATOR DOOR HARDWARE

ESTIMATOR—BUILDINGS AND ENGINEERING WORKS
Arthur Priddle, 693 Stevenson St., at Third, Room 666, Williams Bldg., San Francisco.

FAIENCE TILE
Tropico Pottery Inc., Glendale, Cal.

FELT—ASPHALT, DEADENING
The Paraffine Companies, Inc., San Francisco.

FENCES—WIRE AND IRON
Standard Fence Construction Co., 245 Market St., San Francisco, and 316-12th St., Oakland; 320 Los Angeles St., Los Angeles.

FILLING STATION EQUIPMENT
S. F. Bowser & Co., Inc., 612 Howard St., San Francisco.
Wayne Oil Tank & Pump Co., 531 Howard St., San Francisco, 830 S. Los Angeles St., Los Angeles.

FIRE EXIT LATCHES
Vonnegut Hardware Co., Indianapolis, Ind.

FIRE ESCAPES
Michel & Pfeffer Iron Works, 1415 Harrison St., San Francisco.
Palm Iron & Bridge Works, Sacramento.
Western Iron Works, 141 Beale St., San Francisco.

FIRE-PROOF DOORS
Forderer Cornice Works, 269 Potrero Ave., San Francisco.
U. S. Metal Products Co., 330-10th St., San Francisco.
Fire Protection Products Co., 3117-20th St., San Francisco.

FIRE SPRINKLERS—AUTOMATIC
Grinnell Company of the Pacific, 453 Mission St., San Francisco.
Independent Automatic Sprinkler Co., 72 Natoma St., San Francisco.
Pacific Fire Extinguisher Co., 421 Howard St., San Francisco.

FIRE RETARDING PAINT
The Paraffine Companies, Inc., 31 First St., San Francisco.

FIXTURES—BANK, OFFICE, STORE, ETC.
Home Manufacturing Company, 543 Brannan St., San Francisco.
The Fink & Schindler Co., 218-13th St., San Francisco.
Mullen Manufacturing Co., 64 Rausch St., San Francisco.
C. F. Weber & Co., 885 Market St., San Francisco, and 210 N. Main St., Los Angeles, Cal.

FLOOR TILE
Mangrum & Otter, 827 Mission St., San Francisco.
S. & S. Tile Company, San Jose.
Van Fleet Freear Co., 61 New Montgomery St., San Francisco, and 420 S. Spring St., Los Angeles.

FLOOR VARNISH
Bass-Huetten and San Francisco Pioneer Varnish Works, 816 Mission St., San Francisco.
Fifteen for Floors, made by W. P. Fuller & Co., San Francisco.
The Paraffine Companies, Inc., San Francisco, Los Angeles, Portland and Seattle.

FLOORS—HARDWOOD
Oak Flooring Manufacturers Association of the United States, Ashland Block, Chicago, Ill.
Parrott & Co., 220 California St., San Francisco.
Strable Hardwood Company, 511 First St., Oakland.
E. L. Bruce Co., Manufacturers, Memphis, Tenn.

FLOORS—MASTIC—FLOOR COVERING
Hill, Hubbell & Company, 115 Davis St., San Francisco.
The Paraffine Companies, Inc., San Francisco, Los Angeles, Portland and Seattle.

FLUMES
California Corrugated Culvert Co., West Berkeley, Cal.
Jas. A. Nelson, 517 Sixth St., San Francisco, cisco.

JOHN A. PETERSON, President
B. HEINRICH, Vice-President
SAN FRANCISCO ELEVATOR CO., Inc.
ELEVATORS
Automatic, Electric, Hydraulic, Belt Power, Automatic Dumbwaiters and Handpower Machines, Push Button Passenger Elevators a Specialty
Telephone Kearny 2412
860 FOLSOM STREET, SAN FRANCISCO
ARCHITECTS’ SPECIFICATION INDEX—Continued

FUEL OIL SYSTEMS
S. T. Johnson Co., 1337 Mission St., San Francisco.
S. F. Bowser & Co., Inc., 612 Howard St., San Francisco.
Wayne Oil Tank & Pump Co., 631 Howard St., San Francisco.

FURNACES—WARM AIR
Mangrum & Otter, 827 Mission St., San Francisco.
Montague Range and Furnace Co., 826 Mission St., San Francisco.
Pacific Heating Company, Second and Grove Sts., Oakland.

FURNITURE—BUILT-IN
Hoosier Kitchen Cabinet Store, Pacific Bldg., San Francisco.

FURNITURE—SCHOOL, CHURCH, ETC.
Home Manufacturing Company, 543 Brannan St., San Francisco.
Rucker-Fuller Desk Co., 677 Mission St., San Francisco.
W. & J. Sloane, 216 Sutter St., San Francisco.

GARAGE HARDWARE
The Stanley Works, New Britain, Conn., Coast sale offices, San Francisco, Los Angeles and Seattle, Wash.
California Hydraulie Engineering & Supply Co., 70-72 Fremont St., San Francisco.

GAS STEAM RADIATORS—FUMELESS, ETC.
Ra-Do Fumeless Gas Radiators, manufactured and sold by Baird-Bailhache Co., 478 Sutter St., San Francisco.

GLASS
American Window Glass Co., represented by L. H. Butcher Co., 862 Mission St., San Francisco.
Cobbleick-Kibbe Glass Co., 175 Jessie St., San Francisco.
Fuller & Goepp, 32 Page St., San Francisco, and Syndicate Bldg., Oakland.
W. P. Fuller & Company, all principal Coast cities.

GRADING, WRECKING, ETC.

GRANITE
California Granite Co., Builders' Exchange, San Francisco.
Raymond Granite Co., Potrero Ave., and Division St., San Francisco.

GRAVEL AND SAND
Coast Rock & Gravel Co., Call-Post Bldg., San Francisco.
Del Monte White Sand, sold by Del Monte Properties Co., Crocker Bldg., San Francisco.

GYMNASHIUM EQUIPMENT
Ellery Arms Co., 583 Market St., San Francisco.

HARDWARE
Jost Bros., agents for Russell & Erwin Hardware, 1633 Market St., San Francisco.
The Stanley Works, New Britain, Conn.; Coast sales offices, San Francisco, Los Angeles, and Seattle, Wash.
Corbin hardware, sold by Palace Hardware Co., 581 Market St., San Francisco.
Vonnegut hardware, sold by Abeel-Jensen Co. Call Bldg., San Francisco.

HARDWOOD LUMBER—FINISH, ETC.
Parrott & Co., 320 California St., San Francisco.

HEATERS—AUTOMATIC, GAS, ELECTRIC
Electric Sales Service Co., manufacturers of Therm-elect Water Heater, West Berkeley.
Pittsburg Water Heater Co., 475 Sutter St., San Francisco.
Ra-Do Fumeless Gas Heater, sold by Baird-Bailhache Company, 478 Sutter St., San Francisco.

HEATING AND VENTILATING CONTRACTORS’ EQUIPMENT, ETC.
Alex Coleman, 706 Ellis St., San Francisco.
Gilles-Schmid Company, 195 Ots St., San Francisco.
Hatchey & Hatley, Mitau Bldg., Sacramento.
Mangrum & Otter, 827-831 Mission St., San Francisco.
Lawson & Drucker, 450 Hayes St., San Francisco.
James A. Nelson, 517 Sixth St., San Francisco.
William E. Wilson Co., 328 Mason St., San Francisco.
Pacific Fire Extinguisher Co., 424 Howard St., San Francisco.
Mechanical Engineering & Supply Co., 995-7th St., Sacramento.

Haines Heating Systems
Assure Heating Satisfaction
O. M. SIMMONS CO. 115 Mission St., San Francisco Phone: Douglas 5497

When writing to Advertisers please mention this magazine.
ARCHITECTS' SPECIFICATION INDEX—Continued

Scott Company, 242 Minna St., San Francisco.
O. M. Simmons Co., 115 Mission St., San Francisco.
Griffin Sheet Metal Works, Fresno.
Tiltz Engineering & Equipment Co., 479 Monadnock Bldg., San Francisco.

HOLLOW TILE BLOCKS
Cannon & Co., plant at Sacramento; 770 O'Farrell St., San Francisco.
Los Angeles Pressed Brick Co., Frost Bldg., Los Angeles.

HOSPITAL FIXTURES
Mott Company of California, 533 Mission St., San Francisco.

HOSPITAL SIGNAL SYSTEM
Chicago Signal Co., represented by Garnett Young & Co., 612 Howard St., San Francisco.

HOTELS
St. Francis Hotel, Powell, Geary and Post Sts., San Francisco.

ICE MAKING MACHINERY
Cyclops Iron Works, 837 Folsom St., San Francisco.

INGOT IRON
"Armco" brand, manufactured by American Rolling Mill Company, Middletown, Ohio, and 10th and Bryant Sts., San Francisco.

INSPECTIONS AND TESTS
Robert W. Hunt & Co., 251 Kearny St., San Francisco.

INSULATION—CORK
Van Fleet-Frear Co., Sharon Bldg., San Francisco.

INSURANCE BROKERS
William Healey & Son, Crocker Bldg., San Francisco.

INTERIOR DECORATORS
Atherly Bros., 2032 Polk St., San Francisco.
Martin & Frederick, 1374 Sutter St., San Francisco.
John Breuner Co., 281 Geary St., San Francisco.
The Torney Co., 1912 Larkin St., San Francisco.
A. Quandt & Son, 374 Guerrero St., San Francisco.

KITCHEN CABINETS
Hoosier Kitchen Cabinet Store (O. K. Brown, Mgr.), Pacific Bldg., San Francisco.

KITCHEN EQUIPMENT
Griffin Sheet Metal Works, Fresno.

LAMP POSTS, ELECTROLIGHTS, ETC.
J. L. Mott Iron Works, 533 Mission St., San Francisco.

LANDSCAPE ARCHITECT
Emerson Knight, 704 Market St., San Francisco.

LANDSCAPE GARDNERS
MacRorie-McLaren Co., 141 Powell St., San Francisco.

LATHING AND PLASTERING
MaeGruer & Simpson, 226 Tehama St., San Francisco.
A. Knowles, Cali-Post Bldg., San Francisco.

LATHING MATERIAL
Pacific Materials Co., 525 Market St., San Francisco.
Truscom Steel Co., Tenth St., near Bryant, San Francisco.

LIGHT, HEAT AND POWER
Great Western Power Company, Stockton St., near Sutter, San Francisco.
Pacific Gas & Electric Co., Sutter St., San Francisco.

LIGHTING FIXTURES
Thomas Day Company, Mission, near Third St., San Francisco, and Oakland.
Roberts Mfg. Co., 663 Mission St., San Francisco.
Electric Appliance Co., 807 Mission St., San Francisco.

LIME
Henry Cowell Lime & Cement Co., 2 Market St., San Francisco.

LINOLEUM
B. N. & E. Walter & Co., 562 Mission St., San Francisco.
The Paraffine Companies, factory in Oakland; office, 34 First St., near Market, San Francisco.
W. & J. Sloane, 216 Sutter St., San Francisco.

LUMBER
Dudfield Lumber Co., Palo Alto, Cal.
Hart-Wood Lumber Co., Fifth and Berry Sts., San Francisco.
Pope & Talbot, foot of Third St., San Francisco.
Santa Fe Lumber Co., 16 California St., San Francisco.
Sunset Lumber Company, First and Oak Sts., Oakland.

MAGNESITE FLOORING, STUCCO, ETC.
Dorite Mfg. Co., 116 Utah St., San Francisco; Metropolitan Bldg., Los Angeles.

MAIL CHUTES
American Mailing Device Corp., represented on Pacific Coast by Waterhouse-Wilcox Co., 523 Market St., San Francisco.

RAY COOK MARBLE CO.
IMPORTED AND DOMESTIC MARBLES
For Building Construction
Factory and Office, foot of Powell St., Oakland
Phone Piedmont 1099

When writing to Advertisers please mention this magazine.
ARCHITECTS' SPECIFICATION INDEX—Continued

MANTELS—WOOD, TILE, ETC.
Mangrum & Otter, 927-831 Mission St., San Francisco.
Fink & Schindler, 218-12th St., San Francisco.

MANUAL TRAINING EQUIPMENT
Smith-Booth-Usher Co., San Francisco and Los Angeles.

MARBLE
American Marble and Mosaic Co., 25 Columbus St., San Francisco.
Ray Cook Marble Company, foot of Powell St., Oakland.
Joseph Musto Sons, Keenan Co., 535 N. Point St., San Francisco.
Vermont Marble Co., Coast branches, San Francisco, Portland and Tacoma.
Tompkins-Kiel Marble Company, 595 Fifth Ave., New York; also Chicago, Philadelphia and San Francisco.

METAL DOORS AND WINDOWS
Fire Protection Products Co., 3117-29th St., San Francisco.
Waterhouse-Wilcox Co., Inc., 523 Market St., San Francisco.
U. S. Metal Products Co., 330 Tenth St., San Francisco.

METAL FURNITURE
Forderer Cornice Works, 269 Potrero Ave., San Francisco.

MILL WORK
Dundfield Lumber Co., Palo Alto, Cal.
Pacific Manufacturing Company, San Francisco, Los Angeles, Oakland and Santa Clara.
National Mill and Lumber Co., San Francisco and Oakland.
The Fink & Schindler Co., 218-13th St., San Francisco.
Lannom Bros, Mfg. Co., 5th and Magnolia Sts., Oakland.

NOTARY PUBLIC
William Healey & Son, 260 Crocker Bldg., San Francisco.

OIL BURNERS
Fess System Co., 220 Natoma St., San Francisco.
S. T. Johnson Co., 1337 Mission St., San Francisco.
G. E. Witt Co., 582 Howard St., San Francisco.
W. S. Ray Manufacturing Co., 29 Spear St., San Francisco.
F. L. Warner, 664-29th St., Oakland.

OIL STORAGE AND DISTRIBUTING STATIONS
S. F. Bowser & Co., Inc., 612 Howard St., San Francisco.
S. T. Johnson Co., 1337 Mission St., San Francisco.
Wayne Oil Tank & Pump Co., 631 Howard St., San Francisco.
830 S. Los Angeles St., Los Angeles.

ORNAMENTAL IRON AND BRONZE
California Artistic Metal and Wire Co., 319 Seventh St., San Francisco.
Federal Ornamental Iron and Bronze Co., 16th St., and San Bruno Ave., San Francisco.
McGoldrick & Pfeffer Iron Works, 1145 Harrison St., San Francisco.
Palm Iron & Bridge Works, Sacramento.
Schrader Iron Works, Inc., 1217 Harrison St., San Francisco.

OVERHEAD CARRYING SYSTEMS
California Hydraulic Engineering & Supply Co., 70-72 Fremont St., San Francisco.


PANIC DOORS
Vonnegut hardware, sold by Aheel-Jensen Co. Call Bldg., San Francisco.

PAINT FOR STEEL STRUCTURES, BRIDGES, ETC.
The Paraffine Companies, Inc., 34 First St., San Francisco.
Hill, Hubbell & Company, 115 Davis St., San Francisco.

PAINTING—SPRAY EQUIPMENT
Pneumatic Painting Machinery Co., 1016 Monadnock Bldg., San Francisco.

PAINTING, TINTING, ETC.
Atherly Bros., 2632 Polk St., San Francisco.
Wayne & Williams, 1821 Eddy St., San Francisco.
I. R. Kissel, 1747 Sacramento St., San Francisco.
D. Zelinsky & Sons, San Francisco and Los Angeles.
The Tormey Co., 681 Geary St., San Francisco.
Fick Bros., 475 Haight St., San Francisco.
A. Quandt & Son, 274 Guerrero St., San Francisco.

PAINTS, OILS, ETC.
Magner Bros., 411-412 Ninth St., San Francisco.
Bass-Hueter Paint Co., Mission, near Fourth St., San Francisco and all principal Coast cities.
The Paraffine Companies, Inc., San Francisco, Los Angeles, Portland and Seattle.

PARTITIONS—FOLDING AND ROLLING

PIPE—STEEL AND WROUGHT IRON
Western Pipe & Steel Co., 441 Market St., San Francisco; 1758 N. Broadway, Los Angeles.

PIPE FITTINGS

PLASTER

PLASTERING CONTRACTORS
A. Knowles, Call Bldg., San Francisco.
MacGruer & Simpson, 266 Tehama St., San Francisco.

PLUMBING CONTRACTORS
Alex Coleman, 706 Ellis St., San Francisco.
Gilley-Schmid Company, 199 Otis St., San Francisco.
Hateley & Hateley, Mitau Bldg., Sacramento.
Scott Co., Inc., 243 Minna St., San Francisco.
Wm. F. Wilson Co., 326 Mason St., San Francisco.
W. H. Picard, 5550 College Ave., Oakland.

PLUMBING FIXTURES, MATERIALS, ETC.
All-In-One Plumbing Fixture Corporation, 231 Osborn Bldg., Sacramento.
California Steam & Plumbing Supply Co., 671 Fifth St., San Francisco.
Crane Co., San Francisco, Oakland, Los Angeles.
Gilley-Schmid Company, 199 Otis St., San Francisco.

Haines, Jones & Cadbury Co., 857 Folsom St., San Francisco.

When writing to Advertisers please mention this magazine.
THE ARCHITECT AND ENGINEER

Yards:
Tracy - Brentwood
Patterson - Newman
California

Phones:
Kearny 2073 - 2074

Santa Fe Lumber Co.
A. J. Russell, Mgr.
Wholesale and Retail

Polos and Piling
Oil Rig and Ship Timbers
Saginaw Special Shingles

16 California Street

San Francisco, Calif.

"From tree to Consumer"

Pine and Redwood Lumber

Sash Doors and Mill Work

Sunset Lumber Company
Manufacturers — Wholesale and Retail

Main Office and Yards:

First and Oak Streets, Oakland

Phone Oakland 1820

Pope & Talbot

Manufacturers, Exporters and Dealers in

Lumber, Timber, Piles, Spars, Etc.

Office, Yards and Planing Mills

859-869 Third Street, San Francisco, Cal.

Mills: Port Gamble, Port Ludlow and Utsalady, Washington

Pacific Manufacturing Company

Millwork, Sash and Doors

Hardwood Interior Trim a Specialty

Main Office:

Santa Clara, California

San Francisco, 177 Stevenson Street
Oakland, 1001 Franklin Street

Los Angeles, 908 Washington Building
San Jose, 16 North First Street

When writing to Advertisers please mention this magazine.
BLACKBOARDS
First Grade Natural Slate Green or Black Composition Board
Estimates Given for Complete Installations School Furniture and Supplies
STEWART SALES CO.
247 Rialto Building San Francisco, Cal.

ARCHITECTS’ SPECIFICATION INDEX—Continued

H. Mueller Manufacturing Company, 635 Mission St., San Francisco.
Hobbrook, Merrill & Stetson, 64 Sutter St., San Francisco.
Pacific Sanitary Manufacturing Co., 67 New Montgomery St., San Francisco.
West Coast Porcelain Manufacturers, Oceanic Bldg., San Francisco.

POLES AND PILING
Santa Fe Lumber Co., 16 California St., San Francisco.

POWER TRANSMITTING MACHINERY
Meese & Gottfried, San Francisco, Los Angeles, Portland, Ore., and Seattle, Wash.

PRELIMINARY ESTIMATES, VALUATIONS

PUMPS
Chicago Pump Co., represented by Garnett, Young & Co., 612 Howard St., San Francisco.
California Hydraulie Engineering & Supply Co., 70 Fremont St., San Francisco.
Simonds Machinery Co., 117 New Montgomery St., San Francisco.
Ocean Shore Iron Works, 558 Eighth St., San Francisco.

PUMPS—HAND OR POWER, FOR OIL AND GASOLINE
S. E. Bower & Co., Inc., 612 Howard St., San Francisco.
S. T. Johnson Co., 1337 Mission St., San Francisco.
Wayne Oil Tank & Pump Co., 631 Howard St., San Francisco; 580 S. Los Angeles St., Los Angeles.

QUANTITY SURVEYOR FOR CONTRACTORS

RADIATORS—ELECTRIC STEAM
William J. Schwerin, 217 Rialto Bldg., San Francisco.

REINFORCING STEEL
Edward L. Soulé, Rialto Bldg., San Francisco.
Badl-Falk & Co., Call Bldg., San Francisco.
Judson Iron Works, San Francisco and Oakland.
Gunn, Carle & Co., Inc., 444 Market St., San Francisco.
Pacific Coast Steel Co., Rialto Bldg., San Francisco.
Truscon Steel Co., 527-10th St., San Francisco.

REFRIGERATORS
McCray Refrigerator Company San Francisco office, 765 Mission St.

ROCK AND GRAVEL
Coast Rock & Gravel Co., Call Bldg., San Francisco.

ROOFING AND ROOFING MATERIALS
"Maitheifd" and "Ruberoid," also "Pabco" ten and twenty year roofs, manufactured by the Paraffine Companies, Inc., San Francisco.

UNITED BUILDERS OF CALIFORNIA
H. H. Robertson Co., Hobart Bldg., San Francisco.

JOHNS-MANVILLE, Inc., of California, 500 Post St., San Francisco.

RUBBER TILING
New York Belting and Packing Company, 518 Mission St., San Francisco.

RUGS & CARPETS
Edw. J. Margett, 61 Ellis St., San Francisco.
W. & J. Sloane, 216 Sutter St., San Francisco.

SAFETY TREADS
Pacific Materials Co., 525 Market St., San Francisco.

SAFETY VENTS
California Safety Vents Co., 216 Fremont St., San Francisco.

SCENIC PAINTING—DROP CURTAINS, ETC.
The Edwin H. Flagg Scenic Co., 1638 Long Beach Ave., Los Angeles, and 17th and Mission Sts., San Francisco.

SHEATHING AND SOUND DEADENING
The Paraffine Companies, Inc., 31 First St., San Francisco.

SHEET METAL WORK
Forderer Cornice Works, 269 Potrero Ave., San Francisco.

GRIFFIN SHEET METAL WORKS, Fresno, Cal.
PACIFIC HEATING COMPANY, SECOND AND GROVE STS., OAKLAND.
U. S. METAL PRODUCTS CO., 330-10TH ST., SAN FRANCISCO.

FIRE PROTECTION PRODUCTS CO., 3117-20TH ST., SAN FRANCISCO.
ARCHITECTS' SPECIFICATION INDEX—Continued

SHINGLE STAINS
Bass-Huerter Paint Company, all principal Coast cities.
Cabot's Creosote Stains, sold by Pacific Bldg., Materials Co., 325 Market St., San Francisco.
Fuller's Pioneer Shingle Stains, made by W. P. Fuller & Co., San Francisco.

SHINGLES—COMPOSITION, UNIT AND STRIP
The Paraffine Companies, Inc., San Francisco, Los Angeles, Portland and Seattle.

SINKS—COMPOSITION

STEEL HEATING BOILERS
California Hydraulic Engineering & Supply Co., 76-72 Fremont St., San Francisco.
Kewanee Boiler, factory branch, Exposition Building, San Francisco.

STEEL TANKS, PIPE, ETC.
Ocean Shore Iron Works, 55 Eighth St., San Francisco.
S. T. Johnson Co., 1337 Mission St., San Francisco.
Western Pipe and Steel Co., 441 Market street, San Francisco.

STEEL AND IRON—STRUCTURAL
Central Iron Works, 621 Florida St., San Francisco.
Michel & Pfeffer Iron Works, 1415 Harrison street, San Francisco.
Benson & Benson, The Alameda, San Jose
Judson Mfg., Co., 817-821 Folsom St., San Francisco.
Moritson Construction Co., 19th and Indiana Sts., San Francisco.
Pacific Rolling Mills, 17th and Mississippi Sts., San Francisco.
Palm Iron & Bridge Works, Sacramento.
U. S. Steel Products Co., Rialto Bldg., San Francisco.
Ralston Iron Works, 20th and Indiana streets, San Francisco.
Schrader Iron Works, Inc., 1217 Harrison St., San Francisco.
Union Construction Co., 601 Mission street, San Francisco and Key Route Fell, Oakland.
Western Iron Works, 141 Reale St., San Francisco.

STEEL ROLLING DOORS
Kinlar Rolling Steel Doors, sold by Pacific Building Materials Co., Underwood Bldg., San Francisco.


STEEL SASH
Bayley-Springfield solid steel sash, sold by Pacific Materials Co., 325 Market St., San Francisco.
Michel & Pfeffer Iron Works, 1415 Harrison street, San Francisco.
U. S. Metal Products Company, 330 Tenth St., San Francisco.
Truscnn Steel Company, 527 Tenth street, San Francisco.

STORE FRONTS

STUDDING—FIREPROOF STEEL
Steel Studding Company, 1216 Folsom St., San Francisco.

SUMP AND BILGE PUMPS
California Hydraulic Engineering & Supply Co., 76-72 Fremont St., San Francisco.

SWITCHES AND SWITCHBOARDS
Safety Electric Co., 59 Columbia Square, San Francisco.
Western Electric Safety Switch Co., Inc., 247 Minna street, San Francisco.
Meyer's Safety Switch Co., 575 Howard Street, San Francisco.

THEATER AND OPERA CHAIRS
Rucker-Fuller Desk Co., 677 Mission street, San Francisco.

THERMOSTATS FOR HEAT REGULATION
Johnson Service, Kialto Bldg., San Francisco.

TILE FOR ROOFS, MANTELS, ETC.
Cannon & Co., Sacramento; and 77 O’Farrell St., San Francisco.
Gladding, Mclean & Co., Crocker Bldg., San Francisco.
S. & S. Tile Co., 4th and Carrie streets, San Jose.
M. E. RYAN
ELECTRICAL CONTRACTOR
SAN FRANCISCO
519 California St.—Phone Garfield 3139
REDWOOD CITY
205 Main Street—Phone Redwood 250 F

ARCHITECTS’ SPECIFICATION INDEX—Continued

TILE—STONE—CEMENT
National Stone Tile Company, Inc., Merchants
National Bank Building, San Francisco.

TRANSMISSION MACHINERY
Meese & Gottfried Co., San Francisco, Los
Angeles, Portland and Seattle.

TRAVELING CRANES
Cyclops Iron Works, 837 Folsom St., San Fran-
cisco.

VALVES—PIPES AND FITTINGS
California Steam & Plumbing Supply Co., 671
Fifth St., San Francisco.

WALL PAINT
Nason’s Opaque Flat Finish, manufactured by
R. N. Nason & Co., San Francisco, Portland
and Los Angeles.

WATER PAPER AND DRAPERIES
The Tormey Co., 681 Geary St., San Francisco.
W. & J. Sloane, 216-228 Sutter St., San Fran-
cisco.

WATERPROOFING (see Damp-proofing)

WATER SUPPLY SYSTEMS
Kewanee Water Supply System—Simonds Ma-
Chinery Co., agents, 117 New Montgomery St.,
San Francisco.

WHEELBARROWS—STEEL
Western Iron Works, Beale and Main Sts., San
Francisco.

WHITE ENAMEL
“Gold Seal,” manufactured and sold by Bass-
Hueeter Paint Co. All principal Coast cities.

“Silkenwhite,” made by W. P. Fuller & Co., San
Francisco.

“Satinette,” Standard Varnish Works, 55 Steven-
son St., San Francisco.

The Paraffine Companies, Inc., 34 First St., San
Francisco, Los Angeles, Portland and Seattle.

WINDOW SASH CHAIN
The Smith & Egge Mfg. Co., Bridgeport, Conn.
Coast agents, Rawlins & Smith, 367 Mission
street, San Francisco, and L. W. Hellen
Bldg., Los Angeles.

WINDOW SHADES
W. & J. Sloane, 216 Sutter street, San Francisco.
D. N. & E. Walter, 362 Mission street, San
Francisco.

WINDS, REVERSIBLE, CASEMENT, ETC.
Crittall Casement Window Co., Detroit; Water-
house & Wilcox, San Francisco, representa-
tives.

Hauser Window Co., 157 Minna St., San Fran-
cisco.

J. G. Wilson Corporation, 621 N. Broadway, Los
Angeles; Waterhouse-Wilcox Co., Underwood
Bldg., San Francisco.

WIRE FENCE
Standard Fence Co., 215 Market street, San
Francisco; and 319 12th street, Oakland. ....

GLOBE AUTOMATIC SPRINKLERS
Will protect your building and business from destruction by
fire and reduce your Insurance Rate. Write for estimates.

Pacific Fire Extinguisher Company
FIRE PROTECTION ENGINEERS
424-430 Howard Street, San Francisco
Manufacturing Plant, 298 Fremont St.
Your attention is called to Japanese Oak Flooring, sometimes offered at attractive prices, as a substitute for the American.

We know that you will want to protect your clients against being misled.

Many cases are reported where owners had to rip up this Japanese Oak and replace it with American—at great expense.

Japanese Oak betrays its inferiority to the expert eye by its brashy, porous nature and its lack of the beautiful grain or flower which is characteristic of the American-grown.

The trade-mark above, stamped on every stick, always identifies the genuine American product.

We will be glad to send you our free booklets, in colors. They contain accurate and authoritative information about Oak flooring. Every architect should have them in his data files.

OAK FLOORING, MERSASSY
of the U. S.
1036 Ashland Block, Chicago, Ill.
"Simple--Strong--Efficient"

That's what users say of the

STEWARD

Tilting Drum

CONCRETE MIXERS

with

Hercules Engine

drive

And there's one thing more to

add—they're

Reasonably Priced

For sale by

Smith-Booth-Usher Co.
CONTRACTORS AND INDUSTRIAL EQUIPMENT
SAN FRANCISCO
50-60 Fremont Street
Everything OPENLY PRICED in our Illustrated Priced Stock Bulletin

Steel Water Tanks
For High Buildings
For High Pressure Water Systems, Automatic Fire Sprinklers, etc.

ALSO:
Designers, Fabricators and Erectors of General Plate Work, including Hydro-Pneumatic Pressure Tanks, Hemispherical Bottom Tanks and Towers, Oil and Water Tanks, Pipe Lines, Etc. "Western" Corrugated Culvert Pipe

Western Pipe and Steel Company
OF CALIFORNIA
444 MARKET STREET
SAN FRANCISCO
1758 NORTH BROADWAY
LOS ANGELES

When writing to Advertisers please mention this magazine.
Acorn Brand Oak Flooring

Merely specifying Oak Flooring does not always result in a satisfactory floor covering.

An ever increasing number of architects are now specifying Acorn Brand Oak Flooring, manufactured from American grown Oak

Strable Hardwood Company
DISTRIBUTORS

STRABLEWOOD QUALITY

Oakland California
Steel Sash Products

Lupton Steel Sash Products represent more than so many square feet of windows at moderate cost.

They represent an idea—the idea of health, good workmanship and efficiency, due to ample fresh air and light.

Let us tell you about the different types of Lupton Steel Sash Products and how they may be used.

Represented by

WATERHOUSE-WILCOX CO.
San Francisco    Los Angeles    San Diego

*J. McCRAKEN CO.  H. G. LANAHAN & CO.  F. T. CROWE CO.
Portland       Spokane        Seattle        Tacoma

* In Warehouse Stock

When writing to Advertisers please mention this magazine.
The Test of Time—Fuller's Factory White Enamel

Any paint may look presentable when first applied to a building. But Time is the acid-test. It determines whether any product is worthy of the high-sounding claims made for it by its manufacturers. The following unsolicited letter needs no comment:

SCHWABACHER-FREY STATIONERY CO.
San Francisco


Gentlemen: Referring to your favor of the 20th, we are happy to inform you that the paint you furnished for the interior of our new factory, Third and Bryant Streets, is giving us absolute satisfaction.

As a matter of fact, the interior finish of this plant is one of the features in which we take the greatest pride and which we never fail to point out particularly to visitors. The light throughout the building is practically as bright as out of doors at all times.

Altho we have occupied the building for over a year, the interior paint seems just as bright and sparkling to us today, as it did the day we moved in.

We shall be happy at all times to have you send anyone to inspect our plant, whom you are trying to interest in the use of this white daylight paint.

Cordially yours,

(Signed) P. M. BROCK,
General Sales Manager.

W. P. FULLER & CO.

BOISE SACRAMENTO SPOKANE SEATTLE
TACOMA LOS ANGELES SAN DIEGO PASADENA
SANTA MONICA OAKLAND HOLLYWOOD PORTLAND
SAN FRANCISCO STOCKTON LONG BEACH FRESNO
SAN BERNARDINO YAKIMA WALLAWALLA SALT LAKE CITY

When writing toAdvertisers please mention this magazine.
Steam Heating and Ventilating
For Commercial and Public Buildings
Furnace Heating for the Home
Mangrum & Otter, Inc.
827-831 Mission Street
San Francisco, Cal.
Phone Kearny 3155

S. & S. TILE CO. A. L. SOLON and E.P.SCHEMMEL
MANUFACTURERS OF
HAND-MADE TILES FOR WALLS AND FLOORS.
REPRODUCTIONS OF OLD SPANISH AND
MOORISH GLAZED TILES.
Factory, 4th and Carrie Sts.
San Jose, Cal.

"GIANT METAL,""RED METAL" AND STEEL
SASH CHAINS
COPPER AND STEEL
CABLE CHAINS
THE SMITH AND EGGE MFG. COMPANY
BRIDGEPORT, CONN.
Rawlins & Smith 601 Mission Street, SAN FRANCISCO
515 I. W. Hellman Bldg., LOS ANGELES
Coast Agents

GLADDING, McBEAN & CO.
MANUFACTURERS
CLAY PRODUCTS
CROCKER BUILDING SAN FRANCISCO
WORKS, LINCOLN, CAL.

When writing to Advertisers please mention this magazine.
Our new booklets describe Medusa White Cement and Medusa Waterproofing. Explicit specifications; interesting illustrations. We shall be pleased to send them.

Measure "Medusa" Values in Terms of Your Clients' Dollars

Before specifying the integral waterproofing for the cement work on the B. G. Work Estate, competitive samples of concrete were made with the available aggregates, using various brands of waterproofing. Extensive tests then showed that, for each dollar paid for waterproofing, the specimen made with "Medusa" contained the least moisture per cubic yard of concrete.

Medusa Waterproofing is the original integral waterproofing for cement.

Architects may either specify it separately (powder or paste form) for addition to cement at the job, or may specify Medusa Waterproofed White or Gray Cements, which are our standard Portland cements with the Waterproofing added in the correct proportions and thoroughly ground in at the mill.

THE SANDUSKY CEMENT COMPANY, Dept. P, Cleveland, Ohio

PACIFIC COAST DISTRIBUTORS
Riverside Portland Cement Co., Los Angeles, Cal.

MEDUSA WATERPROOFING FOR CONCRETE

The ord car unfailingly answers the needs of the man who desires economical and dependable motor transportation.

The Ford is a valuable ally of the business concern and indispensable to the salesman or the sales force that wishes to cover an extensive territory at the least cost and with the greatest speed.

For eighteen years, we have catered to the needs of the Ford buying public. In our new location and our new building at 11th and Market streets we are in a better position than ever to serve.

Visit our new sales and service quarters. Night service in the garage.

William S. Hughson Co.

Since 1903

Market at 11th Street, San Francisco

Park 1380

Seattle  Portland  Oakland  Los Angeles  San Diego
American
OAK FLOORING
for American Homes

Because American Oak excels that from Japan
in BEAUTY, in "FLOWER," in COLOR, in FIBER,
in STRENGTH, in WEAR

And Bruce Oak Flooring because it embodies all the inherent
superiority of America's finest growth in rugged virgin Oak from
the South's famous hardwood timber forests.

And Bruce Oak Flooring because every piece bears the trade
mark of its maker as a signature to sterling quality—and also the As-
association symbol as a guarantee of standard grades and trade ethics.

Bruce Oak Flooring is serving thousands of thoroughly satis-
fied users in homes of every size, as well as in apartments, stores,
public and semi-public buildings—Ample stocks on hand for
prompt delivery through local dealers, contractors and floor layers.

Instructive Literature On Request

E. L. Bruce Co., Manufacturers

MEMPHIS, TENNESSEE
Wherever there is need for refrigeration service, in the small or large residence, hotel, hospital or institution, there is a McCray to meet that need. More than 30 years’ devotion to the problems of refrigeration has made the McCray standard equipment.

Write today for the New McCray catalogs.
No. 95—for Residences  No. 61—for Markets
No. 72—for Grocers   No. 75—for Florists
No. 53—for Hotels and Institutions

McCray Refrigerator Co.
2261 Lake Street
Kendallville, Ind.

The Gold Medal Mail Chute
Installed in the New San Francisco City Hall, and the White Marble Meritt Building, Los Angeles.

Given highest award at Panama-Pacific International Exposition 1915

Waterhouse-Wilson Co.
California Representatives
523 Market Street
San Francisco
331 E. 4th Street
Los Angeles

F. T. Crowe & Co.
Seattle, Wash.
The J. McCracken Co.
Portland, Ore.

American Mailing Device Corporation

Terra Cotta

Combines beauty with economical first cost and low upkeep. The glazed surface resists wear and the elements, and is easy to keep clean and new in appearance. It is highly fire resistant and can be made in a wide range of designs and colorings.

Tropico Service now offers the architect and engineer the closest cooperation. We will be pleased to estimate on your requirements.

Troppo makers of Tropico Faience and Quarry Tile, Terra Cotta Pipe, Fire Linings, and Vitrified Clay Pipe.

Glenfield, California

Not Only Mixers

but a full line of nationally-known equipment, as well.
We have prepared for a brisk building season.

"Get it from Bacon"

Edward R. Bacon Company
51-61 Minna Street, San Francisco
165 E. Jefferson St.
Los Angeles

When writing to Advertisers please mention this magazine.
ARCHITECTS and engineers who conscientiously strive to give their clients satisfaction invariably choose Wayne equipment. Accuracy, dependability, economy, safety and long life are inherent qualities of Wayne gasoline and oil systems. Wayne engineers will gladly co-operate with you in working out any of your problems.

WAYNE OIL TANK & PUMP COMPANY
746 Canal Street
Ft. Wayne, Ind.
San Francisco Office
631-633 Howard Street
Phone Garfield 1150
Los Angeles Office
836 S. Los Angeles Street
Phone Main 1600

OIL CONSERVATION SYSTEMS

THERE is something cheery about a White Cement House that appeals to the owner. Possibly that is why Stucco Homes have grown to be so popular in California in recent years.

DEL MONTE WHITE SAND
and
FAN SHELL BEACH SAND
used with a White Cement make a perfect stucco finish.

DEL MONTE PROPERTIES CO.
401 Crocker Building
Phone Sutter 6130 San Francisco

When writing to Advertisers please mention this magazine.
STEEL BARS

for reinforcing that are themselves sturdily reinforced with a service that measures up to the mark of

444 Market Street
Phone Sutter 2720

Stocks at Warehouse
10th and Bryant Streets

STEEL BARS

Largest Stock of Reinforcing Bars and Fire Proof Material on the Pacific Coast

TRUSCON DAYLIGHT SASH
All Sizes Carried in Stock

SAN FRANCISCO WAREHOUSE

TRUSCON STEEL COMPANY
CHAS. HOLLOWAY, JR., Branch Manager
527 Tenth Street, San Francisco

When writing to Advertisers please mention this magazine.
Specify Safety

The installation of R-W IDEAL Elevator Door Hardware is a lasting guarantee against accidents and damage suits resulting from open doors. That is why it has been chosen by far-sighted architects for many of the country's largest buildings.

R-W IDEAL

Elevator Door Hardware

includes easy-running, long-wearing hangers for every type of door, as well as automatic, self-locking door closers and checks. Doors so equipped cannot possibly be left open by careless operators. They close swiftly and silently before the car leaves the floor and cannot be opened from the outside without a key.

We have engineers in San Francisco and Los Angeles who will gladly cooperate with the architectural profession in the selection of elevator door hardware. For further particulars regarding the IDEAL line, write for catalog P-21.

Sewage Ejectors Bilge Pumps
Condensation Pumps and Receivers
Return Line Vacuum Pumps
Horizontal Centrifugal Pumps

CHICAGO PUMP COMPANY
Telephone: Douglas 4220

GARNETT YOUNG and COMPANY
612 Howard Street, San Francisco

When writing to Advertisers please mention this magazine.
For the Exacting Client

Pitcher Hangers

Give Satisfaction

Smooth Running — Noiseless — Efficient
Inexpensive

MANUFACTURED BY

NATIONAL MILL & LUMBER CO.

318 Market Street, San Francisco, Cal.

Telephone Kearny 3580

A Snow White Drain Board

PETRIUM SANITARY SINKS are made in Berkeley, California, and are non-porous, non-absorbent and Lye-proof. The entire surface of the drainboard and back is covered with a composition, on which a smooth, glossy, snow white finish is applied mechanically leaving no crevice or corners in which dirt and grease can collect as where tile or wood is used.

Can be installed in any home—new or old

PETRIUM SANITARY SINK COMPANY
FACTORY AND OFFICE, WEST BERKELEY
Agents in Principal Coast Cities

Send for booklet and Price List

When writing to Advertisers please mention this magazine.
Quality Dominates Production of All-in-One Fixtures

The All-in-One factory in Sacramento is now producing and delivering Fixtures, including Kitchen Sinks, Slop Sinks, Lavatories and Bathtubs. We will replace any plumbing fixture made by us that does not drain, or is in any way warped or defective. A rigorous inspection is made of our goods from the raw material to the finished product, which together with the artistic design and superior finish assures satisfaction to the most critical.

We are proud of our products—they represent the fulfillment of an ideal and a distinct forward step in the development of the plumbing industry.

May we tell you more about them?

All-in-One Plumbing Fixture Corporation

231 Oschner Bldg., Sacramento

When writing to Advertisers please mention this magazine.
We wish to announce that the
Tiltz Engineering & Equipment Co.
are still the authorized representatives of the
Ilg Electric Ventilating Co.

Let us show you how to correctly apply high class
ventilating apparatus

SAN FRANCISCO
479 Monadnock Building
Phone Sutter 2518

LOS ANGELES
512 Wright & Callender Bldg.
Phone Automatic 66464

MAGNESITE STUCCO
AND FLOORING

MAGNESITE WATERPROOF
FINISH

DORITE
MANUFACTURED BY THE
DORITE MANUFACTURING CO.
116 UTAH STREET, SAN FRANCISCO

AGENCIES:
METROPOLITAN BLDG., LOS ANGELES
501 5TH AVENUE, N. Y.

CONTRACTOR'S MACHINERY
OSHKOSH PAVERS
OSHKOSH MIXERS
INSLEY GRAVITY PLANTS
OSHKOSH EVEREADY SAW RIGS
INSLEY STEEL CARS and TRACK
HOISTING BUCKETS, Hoppers, Gates, ETC.
STEAM AND ELECTRIC HOISTS
EVERYTHING USED BY CONTRACTORS
CARRIED IN STOCK BY
GARFIELD & CO.
HEARST BUILDING, SAN FRANCISCO
PHONE SUTTER 1036

RA-DO FUMELESS GAS RADIATORS
ALL CAST IRON—3 Sizes (3, 5, and 7 Sections)
The Ideal "Year-Round" Heating System
For The Home—New or Old
Easiest and Cheapest to Install
Lowest Operating Cost

BAIRD-BALHACHE COMPANY
MANUFACTURERS
178 Sutter St., San Francisco
Phone Sutter 6858

When writing to Advertisers please mention this magazine.
Old Mission
Portland Cement Company

Each shipment of "OLD MISSION" Portland Cement is guaranteed not only to equal but to surpass all requirements of the standard specifications for Portland Cement as adopted by the U. S. Government and by the American Society for Testing Materials. A Guarantee Certificate is mailed with the bill of lading of each car, giving number of car, date packed, and number of barrels, over the signature of the chief chemist.

SALES OFFICE:
MILLS BLDG., SAN FRANCISCO
PHONE SUTTER 3075

PLANT:
SAN JUAN, CAL.

When writing to Advertisers please mention this magazine.
 Architects make no mistake specifying

FYER-WALL

ALL METAL DOORS AND SHUTTERS

Inspected and labeled by
Underwriters' Laboratories

A Fireproof Door for Factories, Warehouses, Power Plants, etc. Cheapest and best fire door on the market.

FIRE PROTECTION PRODUCTS COMPANY
FIRE DOORS—KALAMEIN—GENERAL SHEET METAL WORK
3117-3119 Twentieth Street, San Francisco
Phone Mission 2607

ECONOMY STRENGTH

"Bois" System of

METAL STAIR CONSTRUCTION
Using Interlocking Treads and Risers
ARE USED IN ALL TYPES OF BUILDINGS

Full Information and Estimates Furnished

Manufactured by
UNITED STATES METAL PRODUCTS CO.
330 Tenth Street, San Francisco, Cal.

Hauser Reversible

THIS Modern Apartment House in San Francisco designed by Architect E. E. Young, is equipped with the Hauser Type Fixture.

Manufactured and Installed by

Hauser Window Co.

137 Minna Street Phone
SAN FRANCISCO Kearny 3706

When writing to Advertisers please mention this magazine.
Marble: Interior and exterior executed by George Brown & Co., New York, N.Y.

Rough stock furnished by Tompkins-Kiel Marble Co., New York, N.Y.

Architects: Dennison & Hirons, New York, N.Y.

Both the exterior and interior of the National Bank at Elizabeth, New Jersey, were finished in Napoleon Gray Marble.

This is only one of many such institutions for which we have been called upon to supply the marble.

In the erection of this building, over 3,900 cubic feet of Napoleon Gray Marble were used.

For samples of marble or stone—write to us.
QUALITY HARDWARE

Locks and Builders' Hardware

PALACE HARDWARE CO.
"San Francisco's Leading Hardware Store"

581 MARKET STREET, SUTTER 6060

Kewanee Water System
Maintain your own Plant.
Small Operating Expense.
A Perfect Water Supply to
Country Homes, Hotels, and Parks.

Simonds Machinery Co.
117-121 New Montgomery St.
SAN FRANCISCO
Phone Kearny 1457

UHL BROS.
San Francisco
Oakland
Seattle
Los Angeles
Portland

For
Hotels
Apartment
Houses
Hospitals
Factories
Etc.

Barreled Sunlight

Pack your Radiator Valves with
Palmetto Twist Packing
It can be unstranded to fit any
size Valve. It does not get hard

H. N. COOK BELTING CO.
401-433 Howard St., San Francisco, Cal.

When writing to Advertisers please mention this magazine.
Announcing
a NEW building unit

HERE, at last, is a thoroughly practical building product of concrete.

STONE-TILE, the hollow brick that satisfies the prevailing need for economy and that combines in its field of usefulness advantages never before condensed in one masonry unit.

STONE-TILE serves an uncommonly broad field of building design, because it is naturally adaptable to the structural uses which unit masonry is called upon to fit.

STONE-TILE is composed of properly graded concrete, poured wet to insure uniform strength and density. STONE-TILE quality is maintained at a uniform high standard.

Attractive in appearance, the softness of tone and texture, characteristic of STONE-TILE walls, together with the joint marking made possible through the small size of the units, give distinctive individuality to buildings constructed of this material.

STONE-TILE has met every test. It is noteworthy that among those by whom this product has been approved and is in use is included the engineering department of one of the largest transcontinental railway systems in the country.

May we send you the facts about STONE-TILE?

The National Stone-Tile Company, Inc.
Merchants National Bank Building, San Francisco

When writing to Advertisers please mention this magazine.
Fuller & Goepp

32 Page Street San Francisco
Telephone Market 498

Manufacturers of
Art and Leaded Glass Mirrors

Dealers in WHITE Glass for Table Tops, Counter Tops,
Sink Backs, Etc. Complete Stock—Prompt Deliveries

Oakland Office, Jackson at 11th    Tel. Lakeside 7272

CANNON & CO.

Clay Products

Denison Interlocking Tile
Face Brick
Hollow Tile
Roof and Floor Tile

Factory and General Offices:
SACRAMENTO, CALIFORNIA

When writing to Advertisers please mention this magazine.
Hubbell Convenience Outlets

Profile View
2/3 actual size.
Hubbell Convenience outlet showing size of Porcelain body for Single or Duplex type; fitting standard outlet boxes.

Single Type 2/3 actual size.
Hubbell Convenience Outlet No. 5547, with Plate No. 5548, assembled.

Duplex Type 2/3 actual size.
Hubbell Convenience Outlet No. 6257 with Plate No. 6258, assembled. Two identical Te-Slot outlets in the space normally occupied by one.

BOTH TYPES FIT STANDARD OUTLET BOXES

Hubbell Service Type Toggle Flush Switch. Type No. 8141

Any Standard Cap will fit Hubbell Te-Slots

Hubbell Convenience Outlets "Make Electricity Convenient" for the operation of electrical appliances in the home, office, or factory. Plates in any finish. Single outlets with round plates are also available.

We are preparing a special 28-page Bulletin, covering Electrical Wiring Devices. This conforms to all requirements of the American Institute of Architects. Shall we send you a copy?

Harvey Hubbell, Inc.
Electricai Specialties
Bridgeport Conn., U.S.A.

Electrical Specialties
Ray Rotary Fuel Oil Burners

For Steam and Hot Water Boilers
ADAPTED TO ANY TYPE OF BOILER OR FURNACE—High or Low Pressure, 10 to 300 H. P.

We pioneered and developed the horizontal type Rotary Burner. This principle is sound, as the trend of all burner design is toward this type.

Don’t confuse the Ray with other Rotary Burners. We are the largest manufacturers of Rotary Burners in the world. Recent contracts of the Westinghouse Electric Manufacturing Company covered over four thousand motors.

The Ray Oil Burning system is covered by twenty United States Patents. This represents ten years of research and development work.

Can you afford to buy experiments—just born? No matter what your troubles are we can eliminate them with the Ray system. We guarantee the Ray to be the most efficient burner on the market.

W. S. RAY MANUFACTURING CO.
Manufacturers of Ray Crude Oil Burners
Ray Oil, Gas, Coal or Wood Heavy Steel Ranges

OFFICE AND SALESROOM:
29 Spear St., SAN FRANCISCO
Phone Kearny 199

PLANT AND SERVICE:
Bosworth, Milton and S. P. R. R.
Phone Mission 5022

OAKLAND AGENCY:
The Ray Oil Burning Systems
F. L. Warner, Manager
Agencies in all Principal Cities
696 20th Street, Oakland, Calif.
Phone Oakland 3944

ARCHITECTS • BUILDERS • CONTRACTORS

MODERN CONDITIONS practically DEMAND gas heating. Be fore-handed and include provision for the use of GAS HEATING APPLIANCES in your plans and construction program. If an estimate on a complete heating system will help, do not hesitate to call on us.

Pacific Gas and Electric Company

SPECIFY
SCHROEDER
DIRECT - FLUSH
VALVES

For Toilets

"THE SCHROEDER'S CORRECT—ITS FLUSH IS DIRECT"

STANDARD METALS MANUFACTURING CO.
Main Office and Factory
1300-1302 No. Main St., Los Angeles
San Francisco Office
16 Stuart St., Douglas 1134

Sales Representatives: San Diego, Portland, Seattle, Salt Lake City, Denver, Phoenix

When writing to Advertisers please mention this magazine.
FESS SYSTEM TURBINE FUEL OIL BURNER

“Worthy of your consideration”

We are the originators of the mechanical atomizing type oil burner and the largest exclusive manufacturers of oil burning equipment in the west. All parts of our equipment are manufactured in our own plant, thereby assuring prompt and efficient service at all times.

Specify “FESS SYSTEM”—it has no equal

FESS SYSTEM COMPANY, Inc.
218-220 Natoma St., San Francisco. Phones Sutter 6927-6928

Agencies in all principal cities
Member of the Oil Burners Manufacturers' Association of California

SIMPLEX BURNERS

For High or Low Pressure Boilers, Water Heaters, Kiln Dryers, Furnaces, Etc. Operated by Fractional H. P. Motors, Guaranteed for Efficiency and Durability.

BUNTING IRON WORKS

1215 FIRST NATIONAL BANK BLDG. Factory BERKELEY SAN FRANCISCO Phone Sutter 3225
Member of the Oil Burners Manufacturers' Association of California

OIL BURNER EQUIPMENTS

Low Pressure Air and Rotary Mechanical Atomizing Types
Refrigerating and Ice-Making Machines
Direct Expansion and Brine Circulating Systems

T. P. JARVIS MANUFACTURING CO.
CONTRACTING ENGINEERS AND MANUFACTURERS
275 Connecticut Street, San Francisco Phone Market 3397
Member of the Oil Burners Manufacturers' Association of California

JOHNSON'S ROTARY CRUDE OIL BURNER

Can be installed in any BOILER or FURNACE
Gives Satisfactory Results
Simple to Operate—Automatic—Safe
Let us tell you more about this Oil Burner.

S. T. JOHNSON CO.
1337 Mission Street San Francisco, Cal. Phone Market 2759

Agencies: SEATTLE LOS ANGELES FRESNO SAN DIEGO SACRAMENTO
Member of the Oil Burners Manufacturers' Association of California

When writing to Advertisers please mention this magazine.
| Pump Governors | Oil Pumping Sets |
| Oil-Burner Governors | Little Giant Improved Oil Burners |
| Reducing Valves | Duplex Oil Pumps |
| Safety Valves | Rotary Oil Pumps |
| Oil Valves | Oil Heaters |
| Blow Off Valves | Draft Gauges |
| Boiler Feed Water | Boiler Feed Pumps |
| Regulators | |

**G. E. WITT CO., Inc.**
**ENGINEERS**
Manufacturers and Distributors

862-864 HOWARD ST. Phone Douglas 4404 SAN FRANCISCO, CAL.

---

**“The Recollection of QUALITY remains long after the price is forgotten.”**  
**E. C. SIMMONS**

**PACIFIC MATERIALS CO.**

525 MARKET STREET  
SAN FRANCISCO

---

A. F. Edwards, Pres.  
J. M. Fabbri, Vice-Pres.  
J. A. Mackenzie, Secy.

Office Telephone Market 5070  
Chas. F. Eisele, Asst. Mgr.  
J. Rubiolo, Asst. Mgr.  
D. A. Batsford, Asst. Mgr.

**AMERICAN MARBLE & MOSAIC CO.**

25-59 Columbia Square, San Francisco, Calif.  
Near Folsom St., Bet. 6th and 7th Sts.  
Factory on Water Front, South San Francisco. Phone South San Francisco 161

---

**DETROIT STEEL PRODUCTS CO., Detroit**

Direct Factory Branch, 68 Post Street, San Francisco. Phone Sutter 1250

When writing to Advertisers please mention this magazine.
THE ARCHITECT AND ENGINEER

CONTENTS FOR APRIL, 1922

GARDEN GATE, HOUSE OF MR. ELMER H. COX,
Pebble Beach, Cal. ............... Frontispiece
    Chas. F. Cobbedick, Designer
A REVIVAL OF ADOBE BUILDINGS ............... 47
    Irving F. Morrow
MONT ST. MICHEL ............... 59
    Howard G. Bissell, Architect
FACTS ABOUT CONCRETE FLOORS ............... 71
    J. E. Freeman
STABILIZATION OF COST ............... 78
    Adolph Uhl
ARCHITECTURE AND ITS ALLIED ARTS ............... 81
    Louis L. Mendel
PROGRESS IN SANITATION ............... 93
    Arthur J. Phillips
RECENT DEVELOPMENTS IN CONCRETE ............... 100
SHOULD PASSENGER STATIONS BE ARCHITECTURAL MONUMENTS? ............... 102
    Samuel A. Challman
MANY STORIED SCHOOL BUILDINGS NO LONGER POPULAR ............... 104
EDITORIAL ............... 106
WITH THE ARCHITECTS ............... 109

Published Monthly by
THE ARCHITECT AND ENGINEER, INC.
626-27 Foxcroft Building, San Francisco

W. J. L. Kierulf, President
Frederick W. Jones, Vice-President
L. R. Penhorwood, Secretary
GARDEN GATE, HOUSE OF MR. ELMER H. COX, PEBBLE BEACH, CAL.

CHAS. F. COBBLEDICK, DESIGNER
A REVIVAL OF ADOBE BUILDINGS

By IRVING F. MORROW

ADOBE is identified in the popular mind with the Spanish Missions in California, and is regarded as a primitive form of construction, highly perishable, definitely outmoded, and justified where it occurs only by undeveloped industrial conditions which allowed no alternative. With the primitiveness of the method, using the word to connote simplicity and antiquity, there can be no question; documents as old as the early books of the Old Testament record the difficulties of the Israelites in making bricks without straw in Egypt; and to this day there are primitive communities, Oriental, Spanish, Mexican, where adobe is extensively used. But it will probably surprise most people to learn that, in the midst of our highly developed industrial culture, surrounded on all sides by cement, brick, terra-cotta, and stone, there is a movement deliberately to revive adobe construction; and that this movement, far from being an isolated and transient fad, is quiet, reasoned, and widely dispersed in area.

The only current example of adobe which has come to my attention in Northern California is the reconstruction work now in progress at Carmel Mission; although it may have been used in other instances. More of it undoubtedly has been used in the southern part of the State. Mr. John Byers, of Santa Monica, Cal., examples of whose work are shown herewith, is only one of a number of architects who specialize in the designing and building of adobe houses. Mr. Byers approaches his work from the standpoint of craftsmanship. He employs the old methods, with such improvements of detail as the more highly developed industrial conditions of the day render expedient and accessible. The subject is an interesting one, and perhaps the best general survey of it can be given in Mr. Byers' own words:

"First," he says, "let me explain that adobe in Spanish means mud or dirt, and that only. A Mexican does not call any specific soil by the term adobe, as we do. This or that dirt is good or less good to make adobes. They can make adobes out of almost any dirt. I have built houses in a radius of two hundred miles of Los Angeles and never had to pass up a single job on account of the dirt's not being right.
"The vocabulary of the work is varied and picturesque. An adobe is a house, or the mud brick of which it is made. An adobero is the frame or mould into which the mud is put, and the word is also used to designate the man who uses this mould. The pariguela is the stretcher made of wood on which the mud is carried to the adobero. The rajuela is the broken tile or brick or stone put into the chinks between the adobes in the wall to form a plaster bond. A viga is a beam or arrangement of beams like a pergola, often used in the patios, etc.

"The adobe brick can be used in any structure, just as any ordinary fire-baked brick, and the building, when completed, cannot be distinguished from one made of lath and plaster, brick, or hollow tile, which is
the so-called modernized adobe. We use these latter methods to some extent, but most of my work is the other thing. I try to reproduce the effect and spirit of the old Spanish adobes, yielding only a point here and there in favor of a modern chimney, flue or bath tub.

"My men have been with me since I began three years ago. They have built adobes some three and four stories high in Mexico; they have worked on the restoration of the old Missions in Southern California, and have built and lived in adobes practically all their lives. Except the younger men, most of them can neither read nor write. They sign their pay vouchers with a vertical cross (\(\pm\)) and the ordinary X means one day and P one half day on the pay rolls. I find them honest, industrious, and

Adobe House for Mr. Stevenson, Hollywood, Cal.
John Byers, Designer and Builder

Adobe House for Mrs. May Macrennell
John Byers, Designer and Builder
ADOBE HOUSE FOR MR. JEAN IRVINE, SANTA MONICA, CAL.

JOHN BYERS, DESIGNER AND BUILDER
courteous and loyal to their employers. They go at everything they do in a very primitive and direct fashion; they muck or mix the mud with their bare legs.

"If they cannot find straw or manure to put in the bricks, they pull up the grass growing nearby and throw that in. Usually I provide bales of clean straw, though they prefer manure. This, I think, is because in old Mexico it was the nearest thing at hand; though it may be that there is some chemical virtue in the ammonia. Once mucked, the mud is carried on the pariguela to the adobero on the ground, and dumped into it and patted down and smoothed off by hand; when the adobero is lifted off and set down ready for another.

"I use a brick 4 in. x 14 in. x 20 in. for the outer walls and 4 in. x 10 in. x 20 in. for the inner non-bearing partitions. In a two-story building we lay the bricks the 20 in. way for the first floor and the 14 in. way for the second floor, with a 6 in. x 8 in. cement girder to catch the second floor joists. In one-story buildings we use a 2 in. x 8 in. or 2 in. x 10 in. redwood plate bolted down every six feet with a 10 in. lag screw.

"An ordinary excavation of two feet beneath the floor joists furnishes enough dirt to build the house. Adobes of the size mentioned, made and laid in the wall with the rajuela ready for the plaster cost $150.00 per thousand. An ordinary six- or seven-room house would require from four to five thousand adobes. To plaster we use lime and sand and a very little cement, using one coat only over the adobe. This makes a saving of about $1.00 per square yard. We use no casings around the door and window openings, inside or outside, though we can do so if a client insists. The construction is exposed throughout, and heavy timbers, 4 in. x 6 in., 6 in. x 6 in., or 6 in. x 8 in. are used. Some times the rafters or even truss work are of eucalyptus poles. Nothing is faked—if a timber end shows in an elevation the timber runs back and is a supporting member of some sort. No box beams, no hollow walls—the result is a solid building, wind proof, sound proof and water proof.
"This last needs a word. Tar is melted and put on the concrete foundation before any adobes are laid, and waterproofing is either put in the plaster mix before it is laid on, or applied over the finished job.

"The hard stucco plasters do not adhere to adobe walls. Some builders, however, use it over chicken wire fastened to the adobe by means of wire ends laid in the courses as the walls go up. Others use 8d. nails, three to a brick and projecting about one-half inch. The Mexicans claim this only makes a good plaster curtain hanging in front—that there is no actual contact.

"The courses, as I do it, are laid in mud only—a mortar mix would be better but more expensive. The mortar then would be squeezed out from between the bricks and form a rough ridge to hold the plaster and the rajuela could be omitted.

"Where a flat roof with fire wall is designated we use a coping of cement with \( \frac{1}{4} \) in. rods to take up expansion and avoid cracks, putting some good water proofing in the mixing. My Mexicans make the old Spanish floor and roof tiles also by hand, and can reproduce the old time ovens and chimneys made entirely of adobe.

"One has only to look at the old Missions to see how long a naked adobe wall will withstand the elements. An adobe brick once dried will resist almost any amount of water, and bricks even freshly made will take a three-day deluge of rain and still be good enough to use. However, we usually have a great deal of building paper on the job and do not take any chances. Adobe makes a simple direct and sincere construction; it is picturesque and will last a century.

"The work is intensely interesting—a Mexican obrero (or laborer) going up a plank with a forty pound adobe balanced edgewise on his head, makes as good a picture as a Hindoo water carrier or a stone cutter on the Nile.

"The house of which I send you the ink reduction was built almost entirely of heavy timbers from the old Long Wharf (condemned) in
- TYPICAL CROSS-SECTION -

- PLAN OF FIRST FLOOR -

ADOBE HOUSE
John Byers, Designer and Builder
ADOBE HOUSE FOR MR. JEAN IRVINE, SANTA MONICA, CAL.  JOHN BYERS, DESIGNER AND BUILDER
Santa Monica. Its roof is made of scrap tile; scarcely a whole tile in it, and so far has not leaked. The iron grills I picked up at various junk yards. We have on the contrary, just finished another adobe house in which everything has been modernized—three tile bath rooms, hardwood floors throughout, enameled kitchen, woodstone sink, etc., etc."

Mr. Byers adds, somewhat apologetically, "Unfortunately I am not an academic architect." I am inclined, on the contrary, to regard this circumstance as not at all unfortunate. Academic architects, in dealing with small work, are all too prone to do anything and everything except what is natural. If a good part of the academic sophistication among us could be superseded by a sound instinct for craftsmanship and respect for means and materials, our architecture would experience a more healthy development. That genuine popular support without which no
vital architecture can flourish must come, not down from above, but up from below. However many impressive libraries, city halls, railroad stations, war memorials, and other public monuments we may erect, the people at large will remain indifferent to their appeal as long as their intimate tastes are nourished on surroundings which are paltry and unnatural. In propagating sincere construction and logical expression in small buildings Mr. Byers makes himself the true ambassador of a better architecture. The simplicity, naturalness, and substance of his unpretentious buildings are just the qualities needed as antidotes to the flippancy (aesthetic and structural) of much current academic and pseudo-academic design. I hope that Mr. Byers continues to build houses, without indulging in so much as a correspondence or university extension course in "architectural design."

ADOBE HOUSE FOR MR. H. R. JOHNSON, BRENTWOOD PARK, CAL.
John Byers, Designer and Builder

ADOBE GARDEN WALL, SANTA MONICA, CAL.
John Byers, Designer and Builder
REINFORCED CONCRETE SKYSCRAPERS

ALL buildings are numerous in our large cities. Often the only comment that they attract is one of protest against the obstructions encumbering sidewalks during their construction. After a building has been completed few persons not conversant with types of construction will see anything to distinguish it from another similar building. The fact that it may be an entirely different type of construction, introducing perhaps new things of great importance economically, seldom becomes common knowledge. Also seldom does it happen that the average citizen recognizes in a new type of skyscraper an established, accepted type of construction having advantages peculiar to that type alone.

It really required world war conditions to give the necessary impetus resulting in larger, more extensive adaptation of reinforced concrete for skeletons of tall structures. Designers thus forced through inability to obtain materials for the commoner types of construction, turned to concrete and at the same time found to their surprise that the cost of such structures was lower than they had previously believed. They learned that an actual saving resulted by comparison with usual types of so-called thoroughly fireproof construction, worthy of comparison with reinforced concrete.

They have found also that the time required to complete concrete buildings is somewhat less because the time element is considerably under control of the builder, since there is no necessity of waiting for the fabrication and shipment of structural shapes from distant shops. Materials for the most part can be obtained locally. This was of paramount importance during the war when economies in the use of transportation were imperative, and it still constitutes an important advantage of concrete construction. As a result hundreds of tall reinforced concrete buildings have sprung up during the last few years. In fact, in many localities the majority of structures, ordinarily classed as high buildings, and which have been in progress or were completed during the past season, are of reinforced concrete. In Minneapolis and St. Paul alone there are twenty-six buildings from ten to fourteen stories high with reinforced concrete structural frames. A hasty survey covering the entire country discloses that the number of reinforced concrete buildings over ten stories high, completed or under way, total around 300.

Architectural and engineering firms that have thoroughly enlisted the economies and advantages of the high reinforced concrete building have become specialized in this type of construction because of the possibilities thereby offered for professional advancement.

The question naturally arises as to why high concrete buildings required the impetus of war to force their advantages to the attention of architects and engineers. In addition to the mistaken idea that they were high in first cost, the impression prevailed that the lower story columns of high reinforced concrete structural frame buildings would have to be excessively large. Reduction of rentable floor area was added to the assumed higher cost of the buildings with natural acceptance of the resulting error that the entire building would be uneconomical. This impression, like others of its kind, became fixed through tacit acceptance without investigation, largely because of its frequent repetition. It is gratifying to know that the question is no longer viewed in this light—that knowledge of facts prevails and that unsupported statements cannot pass without challenge.—Building Management.
MONT ST. MICHEL
By HOWARD G. BISSELL, Architect

During the two and a half years since the close of the war I have enjoyed reading the many accounts of army experiences which have appeared from time to time in the pages of various magazines. These tales of life at camp, in the trenches, and in the many fields of war activity in Europe, have been doubly interesting to me because of the memory of my own experiences with the 77th Division, which saw some six months of active service. But to me, much as I like to think back to those stirring times on the River Vesle and in the Argonne Forest, the opportunities in the way of travel and study which came after the armistice proved much more interesting. I remember how quickly my thoughts, engrossed up to Armistice Day in war and what Sherman said about it, turned toward the possibilities of "seeing France." Perhaps every soldier had the same vision, especially those of us who are architects or artists. "On to Paris," formerly the battle-cry of the German war lords, now became the watchword of every soldier in the A. E. F. Many went on leave, others without this formality. The architects, painters and sculptors in the army were especially favored by the organization of the A. E. F. Art Training Center at Bellevue, a suburb of Paris. It is of this army Art School and in particular of one of the travel opportunities afforded by it that I like to think and write. Without these trips throughout France my vision of that country would have been limited indeed.

A complete account of the organization, purposes and history of this school was published a few months after its close in June, 1919, in one of the Eastern architectural periodicals. Referring to this article as a background, I wish here to emphasize the wonderful opportunity afforded the men of the architectural profession in the A. E. F., an opportunity of which all those privileged to attend the school took the utmost advantage. Perhaps one phase of its many activities that was recognized as of greatest value, especially by those of us who had never traveled in France before, was the privilege accorded by the authorities of making side trips to the many places of historical and architectural interest within a few hours' ride of Paris. Armed with sketch-books and water colors, parties from the school could be seen any week-end in all parts of northern and middle France. Numerous were the cities abounding in wealth of material for the architect and artist—Reims, Amiens, Mont St. Michel, Chartres, Tours and the chateaux of the Loire, Dijon, Rouen, Soissons, and many others—places well known to the architect as the sites of monumental cathedrals, fortresses and palatial dwellings, photographs of which we had studied at school and had long dreamed of seeing in actuality.

It was on one of these sketching trips I first saw Mont St. Michel, on the coast of Brittany. It is an inspiration now, as I think over the impressions of my visit to the Mont; the fascination of the cathedral with its romantic history; the picturesqueness of the town; and last but not least those justly world-renowned omelettes of the good Madame Poulard.*

Well do I remember that first thrilling glimpse of Mont St. Michel. After a night's ride from Paris, our party arrived at Pontorson, the

---

*The original Mme. Poulard, I believe, has been dead for some time, but the tradition has been assiduously preserved by the cooks and the hens of the region.—Ed.
station nearest the Mont on the Paris-St. Malo Line. Accepting the services of the most energetic of a dozen competing bus-drivers, we were soon traversing the six miles to the Mont in his war-scrapped machine. It was an early morning in May—"apple blossom time in Normandy." As we approached the coast, there loomed up before us through the morning mists of the sea "the lonely rock, walled, battlemented, towered, springing up from the sea, and in its picturesque medievalism more perfect, more complete, than anything any medieval painter or engraver ever saw or imagined."

The island, lying about a mile from shore, is reached by a roadway on a dyke built within the last generation. At high tide the Mont is completely surrounded by the sea, (except for the dyke) while at low tide one sees on three sides miles of wet, shining sand, tempting the pedestrian who warily avoids the quicksand. Unfortunate indeed, though, if he be caught by the incoming tide, which rushes on with the speed and roar of an express train. Not always has the Mont been thus isolated, an island "in the peril of the sea." When the first monks settled there in the sixth century, this lonely rock towered in the midst of a great forest through which a road had been built by the Roman conquerors of Gaul.

One day early in the eighth century there came a terrible quaking of the earth, then a tidal wave which swept away the forest, leaving in a large bay an isolated hill with only those vestiges of the forest visible today. Since that time the monks, finding their space limited, have tunneled deep into the rock and have built high in the air; the little village has clustered itself on the leeward side of the towering abbey; and tremendous walls have been erected to guard against threatening tides from the sea and hostile armies from the land. Such, physically, is the Mont as we saw it that morning.

Crossing over by the dyke to the only gate in this formidable sea wall, we were immediately surrounded by the hotel porters, men and women, vociferously competing for our patronage. To keep the peace we ignored their pleas, thinking it wiser to examine for ourselves the respective merits of the various hotels. Great was our surprise to find that all the hotels bore the name of Poulard—Poulard veuve, or Poulard neuf, or fils—and that each offered equally wonderful omelettes of all kinds. After breakfast and five other meals at the hospitable board of dame Poulard and her sons and nephews, I can agree with the advice of the French writer who says: "À vous, ami lecteur, de faire votre choix; quel qu’il soit, il sera bon."

Thus refreshed by the delicious omelettes served by the aristocratic Madame Poulard herself? we began to wander leisurely around the island. The only way to reach the Abbey was by passing through the town, following in all its climbings and turnings the one squalid street which starts just inside the main gateway at the Tour de la Barde. This road proved to be a sort of winding staircase lined on either side with old inns or shops, leaning against each other and into the road "like so many decrepit inhabitants." On the one side narrow walks led at intervals between the houses out to the terrace along the top of the sea wall; on the other side were precipitous stairways climbing to the upper

---

*This might be cited as proof either that the original Mme. Poulard stamped a dominant culinary personality on the region for all time—established, as it were, a local school of omelette making; or else that omelette-making is an impersonal community tradition in which she merely played a part of unusually graceful acquiescence. This simple dilemma should suggest caution in the facile game of tracing obscure historical influences, in which some critics are prone to indulge. Ed.

†See note p. 59. Ed.
levels of the town, the numerous picturesque houses and the little sheltered garden spots which lend such charm to the landscape. Everywhere were enchanting views; we paused again and again, thrilled with the romance of the medieval setting, and trying to picture in our minds the events that must have transpired there in bygone days.

A contributor to “Arts and Letters” has given us in a few words an idea of the romantic history of Mont St. Michel. He writes of the Mont as “a marvel of art and a miracle of nature, celebrated alike in the annals of history and the legends of tradition. It is, in fact, a perfect nest of legends; it has been an asylum of religious thought, of prayer and meditation; the seat of science; the studio of art; a monastery, a cathedral, and a fortress. Mont St. Michel has been all these,

and it thus holds within its walls an epitome of the life of France during the stormy but romantic period known as the Middle Ages.”

Not being an historian, I shall by no means attempt to discuss the complex facts of this period in the history of France, however important they may be. Let it suffice here to relate a few of the events in the history of the Mont itself. Known as a sacred spot in the time of the ancient Gauls, and dedicated to the worship of Jupiter by the Romans, who called it Mont Jovis, the Mont did not gain its present name until the eighth century. At this time Aubert, Bishop of Avranches, built a church on the rock, dedicating it to St. Michel, and thousands of pilgrims journeyed from far and near to worship at his shrine Dur-
ing the centuries following the flood which separated the Mont from the mainland, fortifications were built which enabled the inhabitants to withstand repeated attacks from hostile armies. The English, especially, while in possession of Normandy, made several attempts to capture the Mont, but were compelled to retire each time from the rain of huge boulders hurled down by the defending garrison. Besides the serious damage that portions of the buildings suffered at the hands of invaders, fire after fire has ravaged the Mont during the centuries of its existence. The Abbey was subsequently converted into a prison for political and religious offenders, serving well in this capacity at the time of the first revolution. Up until 1863 as a house of detention, it finally came under the jurisdiction of the government as an historical monument. Under the supervision of the Société des Monuments Historiques attempts have been made to repair some of the damages wrought by fire and battle, and to restore the Mont and its buildings to their former medieval condition. Of latter days thousands of tourists, attracted by this relic of a feudal past, have flocked to the island to "see the sights"; with guide book and inevitable camera, they have swarmed the island and then passed on, making way for the curious hordes of the morrow. The pilgrims of yesterday came to worship; those of today to picnic.

Climbing ever upward and finding on all sides massive witnesses of this glorious past, we finally reached the entrance of the Abbey itself. Here we were met by the usual guide, who condescended, in return for a fitting consideration, to take us through the Abbey and Cathedral, allowing us the extra privilege of remaining as long as we wished to sketch. It is of course impossible in these few pages to attempt a detailed description of the many vast halls through which we passed that day. An excellent account, historical and descriptive, may be found in "Normandie Monumentale et Pittoresque," by Manche, with many fine illustrations. This account I recommend especially to the average reader of French as being more interesting than other more comprehensive volumes on the subject.

Each room of the vast structure is full of architectural and historical interest. The first hall that we entered was the grand vestibule, known as the Porte des Gardes, where the vassals of the Abbey met on holy days. From this a stairway led to the Merveille, the "marvelous" structure of the group. This towering edifice comprises three stories or zones:

(1) a vast subterranean gallery originally called Les Montgomerries from the Calvinist leader, Montgommery, ninety-eight of whose followers were executed here in cold blood, and later known as Les Ecuries, echoing to the sound of horse and rider;

(2) directly over this crypt the architect had placed the refectory of the monks, a most beautiful example of Gothic architecture, and the Salle des Chevaliers, used during the feudal period of Mont St. Michel as a dining hall of the knights;

(3) above these halls were the dormitory, a vast space of beautiful proportions, and the Cloisters of the Abbey. The latter is a small, square court, high above the sea, and enclosed with double rows of graceful columns with pointed arches above—the whole aptly termed "La Merveille de la Merveille." From the cloisters stairways led to the dungeons, the Crypte de l'Aquilon, the Promenoir, and the cemetery of the monks, all of which played their part in the monastic life of the Middle Ages.
Difficult indeed was the problem which confronted the builders of the Abbey of Mont St. Michel. All of these various halls and spaces were considered necessary elements in the construction of a complete monastery. Given the usual conditions of terrain, the buildings were grouped according to accepted customs of the day with no stint as to area covered. But to build on a high pyramidal, rock, less than a mile in circumference at the bottom, a church, surrounded by all the elements of which a monastery was composed—that was a hard problem to solve. As Manche has put it: “Il ne s’agissait de rien moins que d’entasser Pelion sur Ossa.” Of course the only solution was the one adopted, to dig into the solid rock and build story on story in height. All glory to the monks who conceived and carried out their noble task, and left for the eyes of our generation another of the many witnesses that testify to that unsurpassed religious enthusiasm of the France of the Middle Ages.

Leaving the Merveille we were conducted into the church itself, which crowns the highest part of the island and with its lofty spires stands for all time as an emblem of that medieval inspiration. This church, as is true with so many of the French cathedrals, reveals a blending of architectural styles, due of course to varying ideas of the succeeding builders. The nave is of the Romanesque with its massive round arches; while the choir, built at a later period, is of the purest Gothic with pointed arches and delicate tracery. Unfortunately this part of the church has lost many of its most interesting accessories, such as the altar and the stalls. Directly under the choir is the Crypt des Gros-Piliers, so-called from the tremendous size of the columns which support the choir and a portion of the nave.

But Oh! for a breath of fresh air. I have discovered that three hours in an historical monument produces the disease known to sight-seers as “museum fag.” We were all suffering from this malady as we
finally emerged from the church and climbed a flight of stairs up to the two Tours des Fous. From these, as well as from the Escalier de Dentelle, we looked out upon the whole composition of the buildings of the island, the marshes toward Pontorson and the sea toward the north. We were as if suspended in mid air, isolated from the material things of the earth, and communing, as did the monks of old, with the heavens above.

But we must return to earth. Retracing our footsteps through the veritable maze of ancient halls, we were led back to our starting point in the Grand Vestibule. A few steps from there and we were out on the terrace which follows the top of the sea wall along the south side of the Abbey. After lunch at one of the numerous restaurants which line the terrace, sketching was the order of the day. My ambition had been to make a water-color study of the island as viewed from the dyke, and the pen and ink reproduced in this issue is a later study from this and other sketches made during the two days of our stay. As I was putting in the finishing touches of color, a dense sea fog rolled in, almost obscuring the island from view. This having cleared up in the evening, we walked out on the sands, making a complete tour of the island and examining the different sides of the Abbey and church, no two of which are alike in composition. I wish it were possible to continue with descriptions of the many beautiful pictures to be seen from the different points of vantage. But space is limited; one must see it for one's self.

It was with the greatest regret that we were compelled to leave the island the next day, after having spent what we all have since agreed were the most interesting and worth-while two days of our stay in France. My ambition is to return some time, and, I shall be happy if with this brief account I have succeeded in imbuing any one else with the desire to see and study this wonderful Mont St. Michel.

WHY ARCHITECTS SHOULD ADVERTISE

By W. J. HENRY, C. E., Seattle, Wash.

I think it was Victor Hugo who said "Everything comes to him who waits." Whether it was Hugo or not, I feel quite sure it was not an American. The American motto is more on the order of "Everything comes to him who goes after it."

It would seem to me, however, if there is one class of the American people more than another that favors the Hugo motto it is the architectural profession. For some reason you never hear very much about architects. Once in a great while when some public building or other large and costly structure is being constructed, and we see mention of it every now and then in the daily press, the architect's name is frequently in print, not always however, commendatory, but at any rate we learn that an architect, if not exactly necessary to the construction, had at least something to do with it. If some one should ask us within a year or two after the structure was completed who the architect was, perhaps we could tell them his name, but after a couple of years his name would probably be as difficult to recall as one of the Vice-Presidents.

Ask the average citizen to direct you to some good reliable architect and nine times out of ten he will answer in this wise, "Well, sir, honestly, I couldn't tell you the name of one, but a friend of mine, Mr. John Blank, had one when he built and if you really want me to find
out I can ask him.” On the other hand, if you are in trouble and need a good lawyer, or there is sickness in the family and you need a physician, almost any one of your friends can name you a dozen.

I have rarely visited a city of any size, that in my walks or rides thru the residential district I have not seen one or more architectural gems that invited my more intimate acquaintance, and when I have been so fortunate as to have friends on these walks or rides they have invariably expressed themselves in this manner, “Don’t you frequently see a house, the exterior of which is so attractive that you can hardly resist the impulse to step right up to the door, ring the bell and most humbly and politely, with a thousand pardons, request permission from the owner to examine the premises?” And I have always answered in the affirmative. In fact, on occasions, my enthusiasm has forced me at least far enough to step to the door, ring the bell, tell the lady in as nice a way as I could, how much I admired her home from the exterior and ask her if she would kindly give me the name of the architect who planned the dwelling. I can remember only one instance where the lady could give me the information right off the bat and that happened to be in the City of Portland and her husband proved to be the architect.

Every now and then there is an architectural exhibit, frequently held in places not especially inviting to the general public. At these exhibitions there are shown many masterpieces of the creative art. But they are mostly understood best by those within the profession and are more or less “Greek” to the general public. I have often wondered why the architects did not have a competitive exhibit with prizes given for plans of homes costing say, one type $3,000, one $4,000, one $5,000 and one $6,000. The prizes to be awarded where this plan had been carried out and the home in concrete form might be viewed. The reason I have mentioned homes costing from $3,000 to $6,000 is there are very few homes costing less than $3,000 where the builders feel it necessary to employ an architect and for those costing more than $6,000 an architect is invariably employed.

Another thing I have wondered at is why architects do not, as an organization, carry on a more systematic campaign of educating the masses as to the advantage in employing a man to assist them in planning their homes, whose business is the planning and superintending of home construction. Thousands of dollars are spent by the manufacturers of cement, lumber in its various forms, plumbing fixtures, builders hardware and dozens of different kinds of material employed in building. The magazines and the dailies carry page ads, beautifully illustrated, but I cannot remember of ever seeing anything similar reciting the advantages one would obtain by employing a competent architect to assist him in designing and supervising the building of his home. I am speaking now of an appeal to the public at large, but more particularly to that portion of the public (about 75%, I should say) that lives in homes costing from $3,000 to $6,000.

There may be countless reasons why things are as they are and maybe Hugo was thinking of architects when he made that remark of his, and it’s probably all right, but just the same every time I pass a little Colonial gem I’m going to wonder who the architect was and why he wants to “hide his light under a bushel.”
PATIO, HOUSE OF MR. GEORGE T. COOK, PEBBLE BEACH, CAL.  
PIERPONT AND WALTER S. DAVIS, ARCHITECTS
GARDEN, HOUSE OF MR. GEORGE T. COOK, PEBBLE BEACH, CAL.  PIERPONT AND WALTER S. DAVIS, ARCHITECTS
GARDEN, HOUSE OF MR. ELMER H. COX, PEBBLE BEACH, CAL.
THE ARCHITECT AND ENGINEER

FACTS ABOUT CONCRETE FLOORS
By J. E. FREEMAN

The design of a concrete floor and the construction of the floor proper are generally the features which are given consideration by the architect or engineer. Until recently little thought has been given to the actual finishing of the floor surface or to the influence of protection while hardening upon the future service which may be expected from the floor. Many specifications have contained no more than a perfunctory general sentence on these matters.

Recent investigations and reports, however, have shown the importance of proper finishing and protection against rapid drying during early hardening, so it is right to expect that more attention will be given this part of the work in future.

The subject is of direct interest to the owner as well as to the architect or engineer. One man may have excellent concrete floors in his plant, yet fail to realize the essential factors which contributed to their success. Another owner in the same city may find that a floor laid in his building gives trouble from dusting and he assumes that there is some inherent difficulty in the construction. Yet he walks every day over firm, durable sidewalks or travels miles over concrete roads subjected to much traffic and showing little or no sign of wear under severe usage.

In comparing floors with sidewalks or roads this fact should be considered—a sidewalk or road is continually being wetted on the surface by rain or melting snow, while a floor within a building remains dry once the initial moisture within the concrete has gone. Consider also that experience has shown the splendid resistance to wear of concrete roads and streets under heavy traffic to be due in large measure to the retention of moisture in the concrete while hardening during the first two weeks after construction, either by ponding or by an earth blanket kept wet. Ponding means dividing the surface area into short sections by dykes and covering it with water to the depth of several inches. Practically all state highway departments require some such method of protecting the concrete road surface during early hardening, usually for two or three weeks so as to prevent a too early evaporation of moisture from the surface by rapid drying.

Very few concrete floors are given any such protection during this period. They may be occasionally sprinkled during the first two or three days after they are finished, but after that are left to dry out and if the weather is hot they dry out very rapidly. Yet what are floors in industrial plants but indoor pavements, subjected often to heavy traffic and deserving therefore of the same careful treatment which concrete pavements receive?

Lack of adequate protection while hardening has even been responsible for "dusting" of less traveled surfaces such as porch floors. It is strange that the need for keeping moisture in the concrete while hardening has not been more fully realized, since the hardening of concrete is not a drying out but a chemical and physical change brought about by combination of the mixing water with the cement, and this change cannot be properly developed if the mixing water is removed by evaporation before the proper time.

This is one reason why basement floors often seem to be harder than others—their position below ground prevents as rapid an evaporation of moisture in the concrete as occurs with unprotected surfaces
CONCRETE FACTORY FLOOR PROTECTED WHILE HARDENING BY "PONDING"

A Method Often Used in Concrete Road Construction
above ground. Yet even here if such floors are constructed during warm weather, some protection during early hardening is necessary to produce the best results.

As an illustration of the effect of proper protection while hardening, upon the resistance of concrete to abrasion and also upon its strength, consider the results of an extensive series of tests made at the Structural Materials Research Laboratory, Lewis Institute, Chicago, illustrated in the accompanying chart. The tests from which the curves were drawn were made on four series of specimens, each specimen tested at the end of 120 days. The results of tests for compressive strength of the concrete are shown by the full line and those for amount of wear are indicated by the dotted line. Specimens in the first series were stored in air for 120 days and then tested; those in the second series were stored in damp sand 3 days and 117 days in air; those in the third series 21 days in damp sand and 99 days in air while those in the fourth series were stored in damp sand the full 120 day period. The specimens were mixed in proportions equivalent to a 1:1 1/2:3 concrete.

In order to approximate within a practicable test period what would be the equivalent of several years' actual service, an accelerated test was made, far more severe than conditions in actual practice, by the use of the Talbot-Jones rattler. (For descriptions see Proc. A. S. T. M., Part II 1916.) Furthermore it must be borne in mind that the test specimens stored in air hardened under conditions more favorable than those frequently found during the summer or in arid regions when the concrete is subjected to a rapid evaporation of contained mixing water from the time it is deposited. Thus the differences in comparative results are undoubtedly less than would probably occur in the field.

The meaning of the tests, however, is evident. Proper protection of concrete surfaces during the early hardening period produces a remarkable increase in the strength of the concrete and decreases the amount of wear, or in other words increases the resistance to wear. The standard specifications for concrete floors adopted by the American Concrete Institute and embodying what is considered to be the best practice in floor construction, require that the surface of a concrete floor be covered with damp sand, etc., for a period of at least ten days after finishing. Reference to the chart will show that this practice will produce an increase of over 75 per cent in compressive strength and a similar increase in resistance to wear.

Later tests made on 1:2 cement mortar such as ordinarily specified for floor surfaces and covering a 90-day test period show that 10-day protection to keep the water in the original mixture from evaporating will produce a 50% increase in compressive strength and at least a corresponding increase in resistance to wear.

Protection for 20 days gives still greater increases and in concrete road construction where great strength and resistance to abrasion are desired such protection is generally specified.

Clearly this feature of protection during early hardening is decidedly worthwhile. For a slight additional care in construction the returns measured in service rendered by the floor are increased by over 50% for practically the same investment in materials and labor involved in the construction of the floor. The economy is evident, for
it is the service given and not the first cost that deserves the greater consideration.

The 1921 Report of the Committee on Cement Floor Finish of the American Concrete Institute contains the following paragraph with reference to this subject:

"It may be urged that conditions as to money and time available for ordinary commercial structures as usually built do not allow the carrying out of the provisions given below for insuring proper floors, but all interested should lose no opportunity of urging upon architects, engineers and owners the ultimate financial gain possible for the owner if the necessary precautions are taken with the original installation. For instance a surface constructed according to the best recommended practice given herein, namely ¾ to 1 inch, wearing course applied some time after the supporting slab is poured, can probably be produced under 1920 conditions for 15 cents per square foot, while the poorest surface described would cost at least 5 cents per square foot. Under ordinarily severe traffic, the latter surface will no doubt at once call for the application of a liquid hardener, paint or other remedy at a cost of from 3 to 5 cents per square foot and in the course of one to five years, for the renewal of the surface at a cost of 20 to 25 cents per square foot thus making the final cost of the poor finish much greater. If properly managed practically no time need be lost, but even though the recommended method means a postponement of the use of the building for a period of two weeks to one month, which should be ample time for proper application and curing, assuming that the rental value of the space is 50 cents per square foot per annum, this means an additional expense of about 2 to 4 cents per square foot, while the increase in wearing qualities may range up to 50 per cent, to say nothing of the loss and inconvenience arising from the interruption of operations to treat and replace defective surfaces."

The arguments advanced for the protection of floor surfaces during early hardening to insure retention of moisture in the concrete mixture, do not however point to a need for wet mixtures. On the contrary investigations have shown the great detrimental effect which an excess of water in mixing concrete or mortar will have upon its strength and resistance to wear.

It has been found that one definite quantity of water combined with a given mixture of cement and aggregates will produce the maximum strength possible for that mixture, and that increasing or decreasing this quantity is accompanied by a rapid reduction in the strength of the concrete. This is shown on the accompanying chart drawn from tests made at the Structural Materials Research Laboratory.

For example, if the amount of water used is 20 per cent more than required for maximum strength, the strength of the resulting concrete will be reduced by about 30 per cent; should slightly over 30 per cent excess of water be used, only about one half the possible strength of the concrete will be obtained.

While too little water also has the effect of reducing strength, the tendency in construction has been to use an excess of water, producing a sloppy or soupy mixture, particularly for floor topping. This amounts practically to wasting cement, for the use of 1 pint more water than necessary in a 1-sack batch to make a plastic concrete, produces the same reduction in strength as if 2 or 3 pounds of cement had been
left out of the mix. While in most types of construction the quantity of water required for maximum strength would not make a concrete sufficiently workable, strength must be sacrificed as little as possible and the safest rule to follow is the use of the smallest quantity of mixing water that will produce a workable, plastic mixture.

The mortar for floor surfaces should be mixed and placed in a stiff plastic condition such that it must be handled from the barrows with shovels. Methods of proportioning, mixing, placing and finishing that will enable the builder to keep the water content within the lowest practicable limits are of the utmost importance because of the increased strength and resistance to abrasion thus obtained. The gist of the matter might be summed up in the following rule as applied to floors or to any other concrete work: Put the excess water on the concrete during early hardening, not in the concrete when mixed.

Architects and engineers should find out whether contractors' bids on floor construction include provision for proper protection during early hardening, etc., when they realize the greater returns thereby secured on the owners' money investment. Contractors should realize also the benefits of establishing a reputation for first-class floor construction by careful, conscientious workmanship.
ZONING APOTHEGMS

Zoning sells a town. An unzoned town is like a dead stock of goods on the shelves.
Zoning is a flexible harness in which city expansion works; it may be adjusted in case it galls or frets at any point.
Zoning will flatten out the human pyramid, which congestion has created in a crowded portion of the city.
Zoning substitutes method for chance, symmetry for confusion, progression for patch work and order for chaos in city development.
Zoning affords for the poor man such security from nuisances and invasions as the rich may provide at great expense.—Charles B. Ball.
INTERIOR, MAIN TRANSEPT, THE CATACOMBS OF CYPRESS LAWN.

B. J. S. CAHILL, ARCHITECT
I desire to preface my talk on “Stabilized Costs” by presenting credentials as to my qualifications in addressing you on this subject.

I built and supervised my first home in 1894. In 1898 I built and supervised a three story, class C, building, 50x100. I subsequently built and supervised four other buildings. In 1909 I leased from the Academy of Sciences the property adjoining the Emporium, outlining to Mr. Lewis Hobart, architect, the building desired and with Mr. Lewis Hicks, erected the building, eleven stories high at a cost of $550,000. I am in the material supply business and in daily touch with building operations.

As I stated, I built my first home in 1894—a two story seven room house—cost $2750. The lot cost $1700. Carpenters were then paid $3.50 per day of ten hours.

I desire to digress a moment to tell you how I financed this experiment. I borrowed the entire amount from the bank with my father’s endorsement and paid off same on the installment plan. That transaction firmly rooted thrift in me. It gave my wife an incentive to save.

It is the ambition of every young wife to own her own home. Therefore, I say to the boy’s father—Finance your boy so he can build now. Obligate him to pay back on the installment plan as it creates the saving habit. The greatest boon from father to son is encouragement of this sort when the boy is young.

In 1915 a seven room house cost $3750. The same house could be built today for $5500, but would Mi Ladi buy it? No! There must be hardwood floors throughout, pedestal lavatories, recessed bath tub, breakfast room, built-in side board, tiled sink drain board, stone front stairs and provision for a garage. Of course she’s right. Result: Increased cost, so that the seven room house of today costs $7,000. You can keep adding, especially in architectural features, until the cost doubles.

The $7,000 house I refer to has plaster exterior, gum in the living room, hall and dining room; pine, enameled, for the remaining rooms and one bath. This house, although plainly finished, makes a lovely home, and having financed the purchase of such a home for one of our salesmen, I am presenting you with facts and figures.

I hope you understand the comparison of costs indicated by this chart. The black line indicates the price of each contract. The red line indicates the cost of labor. The yellow line indicates the cost of the building material. For example, the material for concrete foundation and walks is 1/3 of the cost, labor is 2/3’s of cost, plastering 50-50. Note the bottom line—it is a summary of the whole. The black line represents total cost of building and the red line the cost of the labor. The yellow line the material.

The direct labor of the job, including labor done at mill or mill work, represents approximately 50% of the cost. Add to this 10% for the cost of indirect labor, covering manufacturing of plumbing fixtures, of hardware, electrical fixtures, etc., makes labor 60% of the cost. Assuming the contractor adds 10% for his profits, brings the total to 70%, leaving 30% or $2,100 of the cost of a $7,000 house to cover the construction materials.

*Paper read at Build-a-Home-Now Luncheon, Palace Hotel, San Francisco.*
I positively believe the prices on the majority of the building materials are stabilized for months to come—at least on 75% of the materials. Take lead and oil for example, today's price is practically the same as in 1915—despite the fact that the price is uniform at all supply houses. This uniformity of prices applies to cement, plumbing fixtures, rough hardware, etc. An erroneous impression prevails that friendly competition means profiteering. I venture the statement that the leading houses in these commodities would welcome a representative committee to verify the fact that prices are right.

Price cutting invariably leads to disaster. You are, undoubtedly, familiar with the competition between the Power Companies. Today they are regulated by the Railroad Commission. Grant you the rates might be somewhat favorable to the Companies, but it protects the investing public. Some day they might regulate in the same manner the important building materials. For example: cement, lime and plaster, all California products. You are practically regulating labor wage now and it is the correct principle. It does stabilize costs. Lumber
which is 10% of the cost ($700) has fluctuated more in price than any other commodity. Today's price is positively low, but let us assume for argument that prices all along the line might be 10% lower before the end of the year. That would only amount to a saving of $210.00.

The uncertainty of that saving does not justify you in delaying your building.

The demand for all classes of building exists now.

To revert to the cost of labor: Several years ago, I made a trip up the Nile. Can you imagine my astonishment at seeing man power in place of pumping machinery, raising water from the Nile—a lift of twenty feet—for irrigation purposes? A positive fact—four men passing water by bucket from one to the other. Wage scale—twenty cents a day. These people live in adobe houses, using waste sugar cane stalks for doors and awnings. The youngsters go stark naked. The wardrobe of the grown up consists of a one piece model—a black kimono. Can you imagine such a wardrobe—no shoes, no stockings, low wages and a low standard of living go hand in hand.

In Naples, $1.00 per day was a fair wage. I remember seeing a family of four and a burro sleeping, eating and living in the same room.

The wage of 1893 in San Francisco for carpenters was $3.50 and for painters $3.00 for a ten hour day. This just about enabled the man to make ends meet and in those days, half the year the man went to work at dawn and returned at dusk. I speak from experience. Few owned their own homes and I might say there were less than a dozen millionaires in San Francisco in 1893.

Today labor, not alone in San Francisco, but in all the leading cities of the United States, is paid nearly uniform scale of wages. As you know, an arbitration committee fixed the wage scale for an indefinite period, the cost of living being the underlying factor. That is as it should be. Today we have scores of millionaires and thousands of wage earners who not alone own their own homes and have money in the savings banks, but own their automobiles. On a recent visit to the beautiful Moore home at Menlo, while in the course of construction, I was surprised to see at least a dozen autos in front of the house belonging to the mechanics.

Would you, if you could, have them go back to the 1893 wage scale?

The City of Los Angeles is making herself a world record in building. Do you know they are paying the same wage as is paid in the leading cities in the United States, in some instances more. The people of Los Angeles are not waiting for prices to come down. They realize there is a shortage of homes and they very cleverly let the country know it by wiring the War Department some months ago for 10,000 tents to house the homeless. Good advertising that, and it cost nothing, but they are grand masters at that. I respect their pull-together spirit. It has won out. The more power to you Los Angeles and the sooner we follow suit the greater will be our population.

I am sure you will be interested in a comparison of wages being paid by the leading cities in the United States. I quote from the Wage Scale complied by the National Association of Builders, January 31, 1922:

Los Angeles, Chicago, Cleveland, Pittsburg, Shreveport, Washington, D. C., and Seattle are paying $8.00 a day for carpenters, cement finishers, tile setters, painters. New York is paying $9.00 per day, San Francisco (then $8.35) today $8.00. Boston, Des Moines, Philadelphia and Omaha are paying $7.20 per day. San Francisco, Los Angeles,
Columbus, Seattle, Baltimore, Washington, D. C., are paying plasterers $10.00 a day. Los Angeles is paying hod carriers $9.00 a day. San Francisco, New York, Chicago, Cincinnati and St. Louis pay $7.00 per day.

The wage per day might be seemingly high but don't forget these men do not average over 75% working days. That would mean $150 based on an $8.00 a day scale.

What greater evidence do you ask on stabilization of cost than the fact that labor is being paid a uniform standard wage in practically all the leading cities, and labor is 60% of the cost?

ARCHITECTURE AND ITS ALLIED ARTS

By LOUIS L. MENDEL
Member Washington State Society of Architects

EMINENT men of science and research, while studying classic architecture have attempted to explain the origin and development of the three original orders, The Doric, Ionic and Corinthian (The Romans later added the Tuscand and the Composite) but there is no recorded history of their origin or the time it took to develop them as we know them today—simply theories.

History does not show if any part of the architecture was borrowed from pre-historic nations. The history of Egyptian architecture may be said to begin with the construction of the pyramids, but it is long after this age that we find in Egypt a form of structure, which contains the facsimile of style appearing at a later age in Greece.

Foremost historians concede that the inception of architecture in Egypt was the building and decorating of monumental tombs with sculpture and painting to preserve the aspect of the dead.

Next in order of style we have the Byzantine, Arabian, Romanesque, Norman, Gothic, Early English, Perpendicular and Renaissance. After a clear conception of the classes we then take up the styles as advanced with the development of the European countries. A clear knowledge of the principles of these several styles enables an architect to develop and utilize many pleasing effects in his designs for public and domestic work.

Henry Hobson Richardson and Louis H. Sullivan, two of our great American architects, came the nearest to establishing individual styles, as is given credit to any Americans, but their styles did not develop beyond the originators, further than the lasting influence they left on American architecture.

Thirty-five years ago an architectural student would seek a master architect, with an established reputation and practice, where he might be apprenticed to learn every branch of the profession; or, if he was the son of a man of wealth he would be sent to the Beaux-Arts in Paris to finish his education. At that time few American universities had established schools of architecture, while today America has numerous schools of Architecture, Landscaping, Painting, Sculpture and Music, which are up to the world's standard. Is it not marvelous what our American school system of education has accomplished in less than half a century? The United States is fast developing her own ideals in Architecture, Sculpture, Painting and Music, and with her students educated at home, with American environments, we may look to even a greater advancement in the next half century.
FIRST FLOOR PLAN OF THE RESIDENCE OF

Jos. L. Stewart

ARCHITECT

Francis Wall

PLAN, HOUSE FOR MR. JOS. L. STEWART

Joseph L. Stewart, Architect
BUNGALOW, PACIFIC GROVE, CAL.

BUNGALOW, PACIFIC GROVE, CAL.
BUNGALOW, PACIFIC GROVE, CAL.

BUNGALOW, PACIFIC GROVE, CAL.
BUNGALOW, PACIFIC GROVE, CAL.

PLAN OF BUNGALOWS IN JUNIPER PLACE, SAN FRANCISCO
Morrow & Garren, Architects
These Bungalows Are All on Plan Shown on Page 86
These Five Bungalows Are All on Plan Shown on Page 86

BUNGALOWS IN JUNIPER PLACE, SAN FRANCISCO
MORROW & GARREN, ARCHITECTS
LIVING ROOM

DINING ROOM. BUNGALOW IN JUNIPER PLACE, SAN FRANCISCO
Morrow & Garren, Architects. (Finished in Southern Gum.)
AN OAKLAND BUNGALOW

PLAN, AN OAKLAND BUNGALOW
ENTRANCE TO HOME IN MONTEREY
SANITARY plumbing has been a decided boon to womankind and much that formerly proved nerve-racking drudgery is happily no longer tolerated in the well-appointed home. Compare the present efficient kitchen with those in use a score of years ago. Plumbing fixtures are now usually installed—especially kitchen sinks and laundry trays—to conserve physical energy and to render kitchen and laundry work pleasant and agreeable.

In lightening such domestic tasks the popular one piece kitchen sink supported on adjustable legs has played an important part. Such sinks can be obtained with sink, aprons, drainboard and back cast in one integral whole, without a joint or seam to harbor grime or dirt. These with single drainboard may be obtained in a variety of sizes ranging from 42 in. x 20 in. to 60 in. x 22 in. The type with two drainboards requires more space and these range from 60 in. x 22 in. to 78½ in. x 22 in.

For support these sinks are installed on adjustable legs and may be set from 30 to 36 inches from floor to top of drainboard. When set at the right height for the user, physical economy results.

In connection with such sinks the swinging nozzle double mixing faucet is recommended. The user draws thru one nozzle water, hot, tepid or cold. The swinging nozzle when not in use is pushed back out

*Fourth and concluding paper on Modern Sanitary Plumbing.
The Drinkinig Fountain That Projects Both an Angular and Vertical Stream

of the way preventing breakage of china and giving more work room and affording ample accommodation for deep vessels. The mixing faucet idea is becoming extremely popular with progressive housekeepers and the demand for it is increasing to very large proportions.

Considerable thought has been given by sanitarians to the drinking fountain subject. Of course the essential thing is that the orifice thru which the water is projected shall be sanitary and provide a convenient easy way to quench the thirst without permitting the drinker to come into ac-

tual contact with any fountain parts.

There is one very ingenious device accomplishing this. On an annular ring are eight small jet holes so drilled that the eight individual streams are projected in angular streams and where these meet they form a vertical column or mound of water easy to drink from and high enough above the metal parts to prevent actual contact. Should the drinker try while drinking to touch the metal ring with the mouth or face the eight little jets would plug on the face in such a way that the drinker would immediately desist from the attempt.

As treadle operated drinking fountains afford most convenience to the drinker and obviate manual contact, their installation is specially desirable.

The valve, however, should be so constructed that it responds to the slightest touch of the foot, all the working parts should be confined to a small space and made so they can be readily taken out without disturbing the piping or breaking the floor and above all the valve should operate under varying pressures without hammering.
It is often desirable to flush fixtures such as urinals without manually operating the flushing device. The treadle valve is therefore coming into quite general use. Users instinctively desire to flush fixtures and treadle operated devices encourage this human trait; wherever, possible, therefore such fixtures especially in public places should be equipped with the treadle valve.

In surgical work either the treadle or knee action valve on lavatories and sinks is an indispensable necessity and it is not improbable that many sanitary advances in the future will come from a more general use of the treadle operated valve on fixtures now almost universally hand operated.

CORROSION OF UNDERGROUND PIPE

The Bureau of Standards, Washington, recently issued the following statement:

In certain sections a very serious condition exists in connection with underground pipe systems, owing to the corrosive action of the soil upon the iron of which the pipe is made. The loss from this cause is so large that the bureau recently has undertaken an extensive investigation of the subject, with particular reference to the corrosive action of soils on gas and water mains.

In this investigation the bureau has the co-operation of the Bureau of Soils of the Department of Agriculture, the pipe manufacturers and the public utilities companies through the Research Sub-committee or the American Committee on Electrolysis. Forty locations have been selected representing the different kinds of soils to be found throughout the United States and at each locality a number of samples of every kind of iron and steel pipe in commercial use will be buried. Some of these samples will be uncovered from time to time to determine the rate of corrosion. Complete data on the physical and chemical properties of the soil and the pipes will be obtained and extensive laboratory experiments will be conducted to determine the effects of variations and individual characteristics of both soils and pipe materials. Some tests of representative pipe coatings also will be undertaken.

The results of the tests should be of great value in determining the importance of soil corrosion and in selecting the kind of pipe best suited for use in any particular soil. It is expected that considerable data as to the relative rates of corrosion of the different kinds of pipe in the soils under observation will be obtained within two or three years, but the investigation probably will continue over a period of eight or ten years. Progressive reports will be published from time to time as developments warrant.

Wrigley Tower Light Visible 20 Miles

The Wrigley building, Michigan boulevard, Chicago, presents a very striking appearance when it is illuminated at night. The brilliant revolving lights in the top of the tower were not installed as a part of the decorative scheme, as some people imagine; rather they serve as a light house beacon, having been installed by the United States Department of Navigation. This beacon is 400 feet above lake level and is exceptionally powerful, and can be seen for a greater distance than any other signal light on the Great Lakes. In clear weather the light is visible twenty miles away.
THINKS THERE ARE TOO MANY STYLES OF PLUMBING FIXTURES

OURS is undoubtedly an age of great extravagance, and as in the case of many other commodities bought by the public, extravagance in plumbing has led to the manufacturers displaying in their showrooms, and illustrating in their catalogs, a vast selection of elaborate and sometimes very expensive fixtures. "A too large variety of fixtures and fittings is manufactured for architects, builders and owners of houses to choose from," said Mr. William Paul Gerhard, consulting sanitary engineer of New York City, in suggestions made before Secretary Hoover's National Building Code committee in the interest of the betterment of the housing situation. Mr. Gerhard continued:

"Economy demands that the number of types of fixtures should be restricted. A beginning should be made by abolishing entirely all fixtures and fittings which are either not strictly sanitary, or are actually unsanitary or are mechanically imperfect. In this category belong unsanitary bubble fountains, the secret basin waste valves, the short hopper and washout waterclosets, and water closets with local vent attachments, not required where the bathroom or the water closet compartment are provided, as they always should be, with proper ventilation. In this way restrict the types of fixtures to a few from which to make a selection.

"Unrestricted variety of fixtures and fittings has a tendency to increase prices unduly, because it compels manufacturers and supply houses to keep a large stock on hand, which in turn requires storage space, patterns, working capital, etc. Manufacturers must admit that reducing the present confusing multiplicity of styles and applying standardization to those parts of fixtures, which connect with the water and waste system, would tend to a lowering of prices of their products, because overhead expenses would be considerably reduced.

"In this connection I may refer to the Standard Specifications for Plumbing Fixtures, prepared by the Board on Uniform Plumbing Specifications for the U. S. Treasury, War and Navy Departments.

"Greater uniformity and a smaller variety of styles would simplify and cheapen the cost of plumbing installations. But I would go a step further. I contend that it should not be necessary hereafter, when buying finished products from manufacturers to have them assembled and fitted, at great additional cost to the owner, on the job. The fittings selected should be promptly assembled with the selected fixture at the manufacturing establishment, so that even should it be considered necessary—for greater safety and convenience in shipping—to take down and disconnect the fittings, the entire fixture, as illustrated in plumbing catalog, could be reassembled by the journeyman plumber in a few minutes instead of requiring hours and hours to do this at the expense of the owner."

PLANS FOR STATE HIGHWAY TREE PLANTING

AMBITIOUS plans for roadside tree planting and beautification are being perfected through co-operation between the California Highway Commission, county authorities, State Board of Forestry, and State University. Recently an inspection trip to San Diego county was made by Mr. Solon Williams, member of the State Board of Forestry
and Mr. M. B. Pratt, State Forester, and a plan arranged with the county for the progressive planting of the State highway from the Orange county line south to the city of San Diego and from this point to Pine Valley on the San Diego-El Centro lateral, a total distance of about 80 miles. The San Diego County Supervisors have appropriated $1000 to start the work. The species of trees recommended vary according to soil and climatic conditions and include European sycamores, Monterey cypress, desert gum, Australian beach, blackwood acacia, flowering eucalyptus and live oaks.

The Forestry Board and Highway Commission are working with the Fresno County Supervisors on a tree planting plan to cost about $2500.

Yolo County planting of 2920 trees on State Highways has been completed and the total cost was found to be 42 cents per tree, nursery stock furnished free by the Forestry Board at its nursery.

Since the active movement to plant roadside trees commenced, 62½ miles of State highway, distributed in six counties, have been planted with approximately 8000 trees. The maintenance cost runs from $50.00 per mile per year in the valley sections to over $300 per mile per year on desert sections. However, maintenance cost decreases with the age of the trees and in a few years becomes little or nothing with the exception of cost of occasional trimming. The trees have a value both in protection to the highways and beautification of the landscape, far beyond the probable cost of propagation.

NEW ROOFS MADE FROM OLD RAGS

WHEN mother, with characteristic impatience at house cleaning time, drags forth from the clothes closet father's long disused or, perhaps, recently discarded fishing togs, or gives the contents of the garret to the rag man, she little realizes perhaps how much she is contributing in the effort to overcome the housing shortage. Old rags may be a poor shelter for the human body but American ingenuity has made of them an exceedingly artistic, fire-resistant and serviceable shelter for the human habitation.

From rags to roof is a far cry. But nevertheless old rags are now covering more American houses in the form of roll roofings and prepared shingles than all other types of roofing combined. Two-thirds of all roofing requirements in the United States are now supplied from asphalt materials known as “prepared roofing,” the product of a novel and typically American industry that has been developed within the past few years.

The thousands of tons of rags consumed daily by this industry are obtained through dealers in all parts of the country and, upon their arrival at the factory are sorted and reduced to a pulp, similar to that used in the manufacture of paper. This pulp is then transformed into a fabric or felt, of long fibre and great durability. Hot asphalt is forced through every pore and fibre of the fabric and the combination is then coated above and below with asphalt so as to make it proof against decay and leakage. Because asphalt is a substance that does not dry out, the roll roofings or the shingles which are cut from this fabric do not crack or split. They are resilient and pliable and do not break from their moorings. As they contain no materials that freeze or rust they are also proof against frost. The roll roofings or shingles are covered
with a crushed slate or rock surface in attractive colors which shields them from wear and further preserves the fabric against the ravages of the weather. During manufacture the crushed slate or rock surface is imbedded in the asphalt as firmly as pieces of marble are imbedded in a mosaic floor. The shingles are made in different sizes and in three colors—red, green and blue-black. By using appropriate colors or different combinations of colors it is possible for the home builder to get not only a fire-safe and a serviceable roof but one that can be made very artistic and that will blend nicely with the surrounding landscape.

BUILDING IN SAN FRANCISCO

From an Index of the Associated General Contractors of America.

BUILDING was at an unusually low ebb last summer in San Francisco, due mainly to the fact that the building industry was practically deadlocked because of a disagreement between the trade unions and the contractors in regard to the wage scale.

The columns in the accompanying diagram show the value of building permits issued each month during the past 25 months in per cent of the average monthly value of building permits for the two years 1920 and 1921. On March 31, 1921, a board of Arbitration announced a wage scale which made substantial cuts in the prevailing rates instead of increases as the men had demanded, whereupon the unions refused to accept the award and struck.
The contractors in alliance with the Chamber of Commerce and other business organizations put into effect what is called "The American Plan" which is essentially merely the open shop principle. The final effect was the breaking of the strike and a resumption of building operations on a large scale. During September, October, November and December, the building permits issued were approximately equal to the average monthly rate for the entire period covered by the diagram, followed by a tremendous increase in January of this year.

The irregular line in the diagram shows the way in which building permits were distributed during that period, in 20 of the largest cities of the country. Assuming that San Francisco's building should have conformed to this general average, it is clear that January of this year is the first month since March, 1921, when building permits have been up to par in that city. The tremendous increase in January seems to indicate that "The American Plan" is a success, but not until several more months have passed will we be in a position to judge of its ultimate effect.

The very great increase in value of permits in January suggests a sudden release of work held up pending the settlement of labor difficulties, rather than the establishment of a new level of building activity. The value of permits in San Francisco in 1921 was 83 per cent of that in 1920, whereas for the 20 cities the 1921 figure was 123 per cent of the 1920 figure. In the 20 cities the January permits were 11 per cent greater in value than the December permits, while in San Francisco the corresponding increase was 175 per cent.

In the 20 cities the January permits were 27 per cent above the average monthly figure for the previous two years, while in San Francisco they were 171 per cent above. While these large figures are in themselves very encouraging as indicating a marked revival of San Francisco's building industry, it is hardly to be expected that they will be duplicated in succeeding months.

PRICES OF PORTLAND CEMENT IN 1921

Preliminary estimates made by the United States Geological Survey from reports of representative producers of Portland cement show that the average factory price per barrel of Portland cement excluding cost of container in the United States in 1921 was approximately $1.87.

The prices by districts were as follows:

<table>
<thead>
<tr>
<th>District</th>
<th>Average factory price per barrel in 1921</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eastern Pennsylvania and New Jersey</td>
<td>$1.72</td>
</tr>
<tr>
<td>New York</td>
<td>1.90</td>
</tr>
<tr>
<td>Michigan and northeastern Indiana</td>
<td>1.85</td>
</tr>
<tr>
<td>Illinois and remainder of Indiana</td>
<td>1.68</td>
</tr>
<tr>
<td>Western Pennsylvania and Ohio</td>
<td>1.73</td>
</tr>
<tr>
<td>Maryland, Kentucky, Virginia and West Virginia</td>
<td>1.83</td>
</tr>
<tr>
<td>Alabama, Tennessee and Georgia</td>
<td>1.94</td>
</tr>
<tr>
<td>Iowa, Minnesota and Missouri</td>
<td>1.77</td>
</tr>
<tr>
<td>Kansas Nebraska, Oklahoma and Texas</td>
<td>2.15</td>
</tr>
<tr>
<td>Colorado and Utah</td>
<td>2.33</td>
</tr>
<tr>
<td>California</td>
<td>2.35</td>
</tr>
<tr>
<td>Washington, Montana and Oregon</td>
<td>2.51</td>
</tr>
</tbody>
</table>

The average net factory price received per barrel for the whole country in 1920, as shown by reports received from all producers, was $2.02.
RECENT DEVELOPMENTS IN CONCRETE

COLONEL H. C. Boyden in a recent address before the Illinois Society of Architects mentioned that while the art of making concrete is an old one it has been but very recently that serious large scale investigations of its structure and the real effects of various combinations of the ingredients have been undertaken and that laboratory studies have brought out the following important facts regarding the ingredients of which concrete is composed.

If sand contains one thousandth part of organic impurities in terms of the weight of the sand the strength of the concrete will be reduced over 25 per cent; and suggested the importance of the use of the colorimetric test for organic impurities for all sand used for concrete work.

Laboratory tests also show that round sand makes a better concrete and requires less cement than sharp sand and that the size of the sand particles is relatively unimportant if the correct amount of cement is used.

Colonel Boyden called particular attention to the importance of the water content, mentioning that it is in reality of equal importance as the cement in obtaining good concrete and yet is often the most carelessly used and most loosely specified of all the aggregates, generally neglected in all specifications and frequently not even reported in the published data of concrete tests.

Laboratory tests show that the temperature of the mixing water has very little to do with the strength of concrete; that the use of hot water, however, is a most valuable aid in removing frost from the aggregates in cold weather owing to its high specific heat and may be used without danger of harming the concrete. Hot water tends to hasten the hardening of concrete.

With regard to proportioning concrete, recent investigations have brought out the following facts:

That the present method of designing concrete mixtures by using arbitrary volume is wrong; that there is one single proportion that will give the best results with a mixture of given fine and coarse aggregates, and that adding to or reducing the amount of cement is of value only as it affects the relative quantity of water required to make a workable plastic mixture and that the water-ratio is the most important element of a concrete mix.

The water ratio as used by the laboratory is the ratio of the volume of water to the volume of cement in the batch. If one cubic foot of water is used for each sack of cement the water-ratio is called 1.00. The use of more cement in a batch does not produce any beneficial effect except for the fact that a plastic workable mix can be produced with a lower water-ratio. The reason that a rich mixture gives a higher strength is not because more cement is used, but because the concrete can be mixed with a water-ratio that is relatively lower for the rich mixture than for the lean one. If advantage is not taken of this possibility of reducing the water-ratio the additional cement in the richer mixture is wasted.

In order to make these principles available to architects and other users of concrete, the Portland Cement Association's Laboratory has worked out tables of the proportions and quantities required to produce...
concrete of compressive strength from 1500 to 4000 lbs. per square inch at 28 days.

The quantities shown in the published tables are considerably less than those shown in any previous published table due to the fact that they are absolutely net quantities based on laboratory methods of measurements of the aggregates. For this reason the quantities given should not be used for estimating without the addition of proper allowances for waste and the differences due to the practice of measuring aggregates in a loose condition when making field concrete.

It has been found that the less water used as long as the mixture is plastic and the aggregate is not too course for the amount of cement used the stronger will be the concrete. This does not mean, however, that the amount of water can be reduced too far nor that in actual construction it can be reduced to a point that will give the maximum strength shown in laboratory tests. There is another factor that must be taken into account in construction and that is, the workability of the mix. In general terms, the lowest water-ratio should be used that will give a workable mix.

Within the range of plastic mixtures the strength falls off very quickly with the addition of a small amount of water; so much that in a one bag batch the addition of one pint of water more than is necessary to give a workable mix produces a loss in strength as if two or three pounds of cement had been left out. It must not be inferred, however, that a very lean mix with a small amount of water will give as strong a concrete as a rich mix with the same amount of water because a higher water-ratio is required to produce a workable mix with a lean mixture, thereby causing a loss in strength.

The very wet sloppy mixtures that are being used in building construction work may seem economical from the contractor's point of view, but they are certainly extremely wasteful from the designer's and owner's point of view, since in many instances 50 per cent to 60 per cent of the possible strength of the concrete is being thrown away and while it may not always be practical to reduce the amount of water to the ratio necessary to give the maximum strength, yet it certainly can be cut down below the amount commonly used and the additional strength thus given will be of advantage in the design of concrete structures. The designing engineer figures on the compressive strength of 650 lbs. per sq. inch and expects to get a factor of safety of three, but he does not get it with the sloppy mixture often used. By cutting down the water to the proper ratio, a factor of safety of five or six can be secured, or the present allowable unit stresses can be raised.

In order to have a simple method for determining the proper consistency in the field a slump test has been devised. A metal container 4 inches in diameter at the top, 8 inches at the bottom and 12 inches high has been adopted as a standard. This is filled with the concrete to be tested which is carefully worked with a pointed metal rod while it is being placed. The form is immediately lifted off and the settlement or slump measured.

The proper slump for a mix to be used for a concrete road surface is 1/2 inch to 1 inch; for mass work from 1 inch to 1 1/2 inches and for concrete used in building structures with reinforcing bars 2 inches to 2 1/2 inches. In some classes of reinforced concrete work increased plasticity or flowability may be needed. It must, however, only be obtained
by adding cement and water in such quantities as to maintain the proper water-ratio; otherwise a serious loss in strength will occur.

The time of mixing is a matter of importance in obtaining good concrete and as this factor controls the output of the mixer, it affects the cost of the concrete; consequently, there is an unfortunate tendency to reduce the time of mixing, a practice which cannot be too severely condemned because it only results in a material loss in the strength of the concrete and a lack of uniformity. Exhaustive tests made on concrete mixed in a batch mixer from 15 seconds to 10 minutes show a rapid increase in the strength for the first minute and a slightly smaller increase for the second minute after which an increase in strength is less pronounced as the time of mixing increases.

These tests show the necessity of mixing the concrete at least 60 seconds after all of the ingredients, including the water, have been placed in the drum of the mixer. There is no question as to the advisability of using a batch meter on the mixer providing one can be found that cannot be tampered with in order to avoid controversy over the time of mixing and to insure a full mix. When a mixer is manufactured that will not permit discharge until a certain number of revolutions have been made at a certain speed, this problem will have been solved. The revolutions per minute of the mixer within the limits of 12 to 25 R. P. M. have but little effect on the strength of the concrete.

The effect of proper curing conditions upon the ability of concrete to withstand abrasion has been very strongly brought out by numerous tests of the laboratory. There is probably no factor in the handling of concrete that so affects its wearing ability as that of proper protection while curing or hardening. While it is true that all of the factors that tend to produce strength in concrete also tends to increase its wearing qualities; nevertheless all tests show that other factors being the same, concrete which has been properly protected will show more compressive strength and much less wear than concrete which has been allowed to dry out too quickly.

One of the principle causes of the poor wearing resistance that is often found in concrete floors is due to the practice of allowing them to dry out without proper protection during the hardening period. Concrete floors should be covered and kept moist just as outside roads and pavements are protected. Why throw away one-half of the life of concrete floors by failing to observe this rule? Concrete floors should be kept moist and protected for a period of at least twenty-one days in all cases.—Monthly Bulletin, Illinois Society of Architects.

SHOULD PASSENGER STATIONS BE ARCHITECTURAL MONUMENTS?

It was the late Charles Mulford Robinson, if our memory serves us correctly, who first suggested that as the gate to the walled city of other days was a monumental thing, symbolizing the strength and magnificence of the city, and impressing them alike upon stranger and citizen as they passed, so should the modern passenger station be planned to impress arriving and departing travelers.

In this suggestion we believe that Mr. Robinson was right. The fact that he sometimes appeared—particularly to the hard headed engineer
—as an impractical idealist does not brand all his great conceptions as flights of fancy, impossible of realization.

This suggestion of Robinson's is called to mind by the announcement that the new union passenger station at Cleveland is not to be of the monumental type. We are not sufficiently familiar with the Cleveland situation to criticise the decision in the particular case. The great cost of the indispensable features of the station, the present hard-up condition of the railroads, or other reasons may justify the limitations imposed; but the necessity for them is a proper subject of regret, and it is to be hoped that similar necessities will not arise in other cases.

As we see it, the logic of the monumental railway station and of most other public and quasi-public structures is this: America's productive power is now vastly beyond that necessary for the mere supplying of the physical needs of food and shelter. The excess, quite obviously, is spent for the most part on pleasures and luxuries; and of these, few indeed are as thoroughly wholesome as is the enjoyment of beautiful architecture.

The theater and the high class hotel are made beautiful as a business necessity. No one questions that they should be so; but for other buildings there is often criticism—"These gorgeous bank buildings show that the banks are making too much money." "Why don't the church people help the poor instead of spending their money for steeples and colored windows?" "The railways ought to lower their rates instead of building depots like palaces." The reason that such criticisms receive and deserve so little attention is that they approach the subject at the wrong point. If it were true that the money saved on imposing architecture would be turned to the benefit of those most in need, we should say, "Right! Let us postpone such luxuries until all people are supplied with the more vital things." But neither business nor personal ethics in America has yet reached so high a plain. It is inconceivable that the curtailing of these "luxuries" would materially benefit the people most in need of help. In fact we think it most likely that whatever savings might be made would be spent in ways of less benefit to the poorer citizen. We grant the need of a better distribution of wealth and income, but not the need of dispensing with the beautiful and inspiring in order to get it. Limitation of the railway station is a particularly inconsistent way of improving distribution, because the station is so completely a place for the equal use of rich and poor. It may even be the only building of magnificence entered by some of the latter; and we think that its influence is good, for the poor man has not merely the privilege of looking at it; he actually uses it; and if he is a man of appreciative sense and feelings, he takes pleasure in the knowledge that it is intended for his use. How many commuters have not certain feelings of proprietorship and pride in the fine station through which they pass daily? One can note the pride in the way they show it to friends, and the proprietorship in the references to it as "my" or "our" depot.

We hope that there will not be many new stations or other public buildings limited by necessity to "purely utilitarian" requirements.—Engineering and Contracting.
THE modern school building with its regular outline, its batteries of windows, its well distributed exits, and other familiar features has been gradually evolved from the rather picturesque, turret-ed, and high gabled structure in which the up-to-date city or village of twenty-five years ago took particular pride. The present type is, however, none the less beautiful than the old, but it is less ornamental. While the old type was designed from the outside in, the new type is designed from the inside out. The floor plan of the new type governs in the main the features which characterize the exterior, whereas the elevations in the old type fixed to a large extent the interior arrangement.

In consequence our newer buildings are better adapted to their purposes. The lighting is better, the dimensions of the rooms more in keeping with usable space, the height of the ceiling proportioned to actual needs, the stairways easier to climb and more advantageously located, the toilet rooms eliminated from the basement, the corridors narrowed to actual requirements for movements of classes, and a number of other equally desirable features given judicious and befitting recognition.

One idea that until recently has clung tenaciously to our plans has been that of basements under our schoolhouses. Though few reasons were ever advanced for the use to which they might be put, except for storage, generally of inflammable material, the idea that such rooms were desirable was quite generally accepted. Until within recent years they were seldom given any interior trim or used for a particularly desirable purpose but as manual training, home economics, agriculture, and gymnasium exercises began to find their way into the schools they were put into as usable shape as possible so as to provide quarters in which these subjects might be presented. In most instances the rooms were low, dark, and poorly heated and ventilated.

As the subjects gained in popularity, the basement rose out of the ground, until its floor level was not much more than three feet below grade. It advanced from the rank of basement to the more euphonious designation of ground floor. It attained some standing by being well lighted, satisfactorily heated, and ostensibly, at least, provided with ventilation. The first floor which in the old type had been only three or four feet above grade now moved up, until it was ten feet above the surface of the ground. The primary children, who in the old type had climbed six or at most eight steps, in order to reach the floor on which their rooms were located, were now required to climb twenty steps. The first floor reached an altitude which to the lay mind seemed a misnomer and the danger to life in a non-fireproof building of this type soon awakened serious concern in the minds of those who realized what it would mean to get small five, six and seven-year-old children out of such a building in case of fire.

Rooms with floor levels below grade are not looked upon with favor. They generally require a defense when their location is called in question for any purpose except storage. Many people think that a gymnasium may well be in the ground, and, if the room is well lighted, and properly ventilated, the floor and walls dry, there is perhaps no real valid
reason for opposing this location of the gymnasium. The fact remains, however, that more than one gymnasium thus located has been poorly lighted, inefficiently ventilated, and has developed hummocked floors and damp walls. It would actually seem that in order to overcome these handicaps, it is necessary to expend more money for the construction of these rooms than for rooms above ground. If this is actually the case, then why spend more money for less desirable rooms below grade than may be secured above grade?

These considerations of safety, satisfactory service, and questionable economy have led a great many school boards to eliminate basements altogether, except to provide for the mechanical equipment. The first floor is then two to two and a half feet above grade. The small children are not required to climb high stairs. All the subjects of the curriculum are placed on a parity. Industrial courses are given as good quarters as academic. When changes become necessary either may yield space to the other.

When conditions of site and number of pupils do not demand a three-story structure, two stories only are erected. Such two-story buildings are economical of construction, facilitate rapid egress from the building, fit well into the residence section of any city, and, when designed by competent school architects, add materially to the aesthetic effect which good architecture always produces.

The tendency is one which has awakened much favorable comment among educators and architects alike. It has so many sensible considerations in its favor, that it would seem reasonable to suppose that the type will become general as new buildings are being planned.
Seattle Architects Hold Successful Exhibition

Members of the American Institute of Architects, Washington State Chapter, are holding their annual exhibition in Seattle this month and from all accounts the exhibition is one of the best ever held in the Northern city. The display includes photographs of completed work, water color sketches, pen and ink perspectives and floor plans, in addition to some interesting examples of sculpture, wood carving, metal work, pottery, furniture and interior decoration.

A jury has selected 20 or more of the best buildings shown at the exhibition and these will be illustrated in the May number of The Architect and Engineer with appropriate discussion by Mr. Carl F. Gould, president of the Washington State Chapter.

Lack of "American" Architecture

Mr. Guy Haugh of Indianapolis, addressing the Cincinnati Building Owners’ and Managers’ Association, at a recent meeting, declared that an "American" type of architecture is sadly lacking in this country and expressed hope that some day a new type, purely American, would be developed, ranking with any school of any age. Mr. Haugh predicts that if such a type of architecture ever materializes it will undoubtedly be produced in the Middle West and will be evolved from necessity or by the demand of living conditions. He thinks the Middle West represents nearer the American type of people.

Mr. Haugh gives the Americans credit for being "the greatest builders on earth," but in the next breath he takes them off their high pedestal by declaring that our architects are utterly lacking in originality—"using and mixing the different periods of architecture sometimes with beautiful results, but more often with outrageous desecrations—all depending on the idea of the man who involved them."

We think Mr. Haugh is not very well informed. He would do well to come to the Pacific Coast and look around a bit. We have an original type of architecture in California and while it may not be exactly American it has been developed to fit our American ideals and its possibilities for charm and beauty seem to have no limitation.

Whose Duty is it to Insist Upon a Quantity Survey?

A RCHITECTS, engineers and contractors have at last gone on record in favor of the making of quantity surveys of buildings at the owner's expense. It has long been the custom of civil engineers to prepare quantity surveys, commonly known as "bidding sheets," for construction work
other than buildings. In fact nearly every class of civil engineering structure, except buildings, is quantified by the engineer prior to submitting it to contractors. How does it happen, then, that buildings have hitherto been an exception to this rule? The reason would seem to be found in the fact that supervising architects are commonly paid for their services on a percentage basis and not on a salary basis. It is but natural, therefore, that an architect should shift onto the contractor’s shoulders the expense burden of preparing the data for estimating the cost of construction. If only one contractor were invited to bid on each building, there would be no economic loss from this practice, but ordinarily several contractors submit bids, and in doing so each one duplicates the quantity survey work of the other.

Now that the American Institute of Architects has indorsed the plan to have the building owner pay for a quantity survey, we suggest that the architects increase the percentage charged for their services to provide for the cost of making a quantity survey, and that they do not leave such a survey optional with the owner. The omission of a survey is conceded to be an economic mistake. If so, why countenance it any longer? “Any man proposing to spend a considerable sum of money in building should insist on a quantity survey as one of the most certain means of economy that he can display,” says the Journal of the American Institute of Architects. True, but will the average owner insist upon a quantity survey? We doubt it, says the editor of Engineering and Contracting, because the average owner knows very little about building economics.

If so, the insistence should come from the men whose specialty it is to study building economics, namely, architects and engineers. They should carry their insistence to the point of refusing to take charge of building construction unless such a survey is made part of their work.

Notes and Comments

A Plea For Zoning.

The diversified architecture which is now characteristic of our Nation, and the extremes to which exigencies, due to unrestraint, have prompted the profession to go, have had an influence in bringing about the determination of nearly all of our great American cities to adopt Zoning plans.

While the primary object of zoning is to control the purpose, manner and method of using property, it will be recognized that under such control, harmonious and symmetrical development, in a considerable degree at least, must result.

We will concede, I believe, that the city that develops along the most symmetrical and conforming lines is the most beautiful, and when, along with such development, proper regard is exercised to protect health and public welfare, it may be safely said that that community architecturally has attained a condition approximating the ideal.

That the architecture of a city has a distinct influence upon the public mind of that community cannot be denied. It creates harmony or discord in proportion to the approximation of or departure from architectural perfection. It is like the blending of colors in art, or the mathematical and proportional arrangement of sound in music, and even though not skilled in these arts, one may quite readily recognize their imperfections. So, it follows then that the architectural development of a community has much to do with the contentment, delight and satisfaction of its people.—E. S. Goodwin.
Concrete Roads

The advocates of concrete roads declare that these are practically everlasting, but that is the claim made by concrete men for everything constructed of their material. Those who have traveled over concrete roads, laid for two or three years only, may well wonder if the cracks and disintegration brought about by this short period of use is the utmost limit of their deterioration. Of course, modern heavy motor truck traffic is tremendously destructive to road beds, but it is a question whether we have yet found the ideal method of highway construction. There is a limit to the amount the country can spend on road-building, and we cannot know too soon whether concrete roads are actually worth their tremendous cost. The recent low bid for constructing about 60 miles of concrete roads for the Pennsylvania State Highway department averaged no less than $53,333 a mile. One of the organs of the motor industry resents any imputation that this represents a high cost, and declares that the "real truth of the matter is that concrete roads are low-priced.

The more they cost the less they cost.

Paradoxical? Yes, but easily understood. The concrete road needs no attention. It is done when it is finished. No up-keep. Few repairs and 100 per cent efficiency." This is the usual cry of the interested persons. Instead of glittering generalities from the concrete men and the motor trade, the taxpayers who foot the bills should insist upon knowing the exact cost in dollars and cents of the repairs and upkep for concrete roads.—Stone.

Striving for Lower Cement and Material Prices

According to newspaper advices from the middle west, over 3000 miles of cement highway construction in eight states, aggregating in value $125,000,000, are being held up by highway officials pending a readjustment of cement prices downward by the cement manufacturers. The statement is made that in case no drop in price is made that road specifications will be changed to another type of hard surfacing. The price against which the officials are protesting is around $1.75 per barrel, mill base.

The price of cement at present made to the California Highway Commission by all the northern mills in California is $2.35 per barrel, mill base, the mills all quoting the same delivered price and absorbing any freight differentials due to differences in distances from delivery points. Among the mills of Southern California, however, a limited competition exists and the mill base price there is appreciably lower.

Before the war the California Highway Commission enjoyed a range of price from $1.04 to $1.40 per barrel, mill base. The peak price on account of war time conditions was $2.70 on September 2, 1920. It has since dropped to $2.35 but is still fully $1.00 per barrel above pre-war prices.

In certain sections of the State a monopoly also exists in sand and rock. The prices of these commodities have not dropped one penny below the peak war time price. Sand was purchased before the war for 25c per ton and rock for 75c per ton. During the war the price was raised to 65c per ton for sand and $1.10 per ton for rock. These prices are str in effect. Wherever possible the California Highway Commission uses local sources for materials but these do not always exist.

The only element entering into highway construction that has approached normal is the cost of labor.

Building Material Prices

Building material prices for the month of February continued practically on the January level, according to the index figures just issued by the Department of Commerce through the Division of Building and Housing. The building material index for February is shown as 158.7 while the index for January was 159.9. The average price for 1913 is used as 100. The following table shows various index figures for the last three months as published by the Division of Building and Housing:

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Building material index</td>
<td>166.8</td>
<td>159.9</td>
<td>158.7</td>
</tr>
<tr>
<td>Com, brick, kiln, Chicago</td>
<td>186.8</td>
<td>170.1</td>
<td>169.7</td>
</tr>
<tr>
<td>Gravel, New York</td>
<td>186.6</td>
<td>188.6</td>
<td>189.6</td>
</tr>
<tr>
<td>Hollow tile, Chicago</td>
<td>149.0</td>
<td>125.3</td>
<td>128.3</td>
</tr>
<tr>
<td>Com, Lime, U. S. average</td>
<td>211.0</td>
<td>207.8</td>
<td>206.8</td>
</tr>
<tr>
<td>Portland cement, plant</td>
<td>148.4</td>
<td>148.4</td>
<td>148.4</td>
</tr>
<tr>
<td>Sand, New York</td>
<td>201.7</td>
<td>201.7</td>
<td>201.7</td>
</tr>
<tr>
<td>Reinforcing bars, Pittsburgh</td>
<td>169.0</td>
<td>169.0</td>
<td>169.0</td>
</tr>
<tr>
<td>Wire nails, Pittsburgh</td>
<td>153.3</td>
<td>145.0</td>
<td>136.1</td>
</tr>
<tr>
<td>Structural steel, Pittsburgh</td>
<td>99.3</td>
<td>99.3</td>
<td>99.3</td>
</tr>
<tr>
<td>Douglas fir, No. 1, mills</td>
<td>124.9</td>
<td>124.9</td>
<td>135.8</td>
</tr>
<tr>
<td>Hemlock, New York</td>
<td>153.8</td>
<td>153.8</td>
<td>153.8</td>
</tr>
<tr>
<td>Lath, spruce, New York</td>
<td>206.7</td>
<td>193.6</td>
<td>192.6</td>
</tr>
<tr>
<td>Red cedary shingles, mills</td>
<td>148.5</td>
<td>122.0</td>
<td>115.6</td>
</tr>
<tr>
<td>White oak, New York</td>
<td>224.5</td>
<td>224.5</td>
<td>216.2</td>
</tr>
<tr>
<td>Yellow pine flooring, mills</td>
<td>198.1</td>
<td>181.9</td>
<td>190.6</td>
</tr>
<tr>
<td>Plate glass, New York</td>
<td>192.9</td>
<td>195.0</td>
<td>154.0</td>
</tr>
<tr>
<td>Window glass, works</td>
<td>231.0</td>
<td>192.5</td>
<td>154.0</td>
</tr>
<tr>
<td>Linseed oil, New York</td>
<td>145.9</td>
<td>155.8</td>
<td>176.9</td>
</tr>
<tr>
<td>Putty, New York</td>
<td>179.2</td>
<td>179.2</td>
<td>179.2</td>
</tr>
<tr>
<td>Twine, New York</td>
<td>190.2</td>
<td>212.4</td>
<td>210.9</td>
</tr>
<tr>
<td>White lead, New York</td>
<td>181.2</td>
<td>181.2</td>
<td>181.2</td>
</tr>
</tbody>
</table>

Three-Story Apartment House

Plans have been completed by Architect D. A. Riedy, Pacific Building, San Francisco, for a three-story apartment house to cost $35,000, to be erected on Pine street, west of Broderick, San Francisco.
With the Architects
Building Reports and Personal Mention of
Interest to the Profession

State Architect Busy
Much new work is being turned out by the Architectural Department of the State of California, Forum Building, Sacramento, and bids for construction of various buildings throughout the State will be advertised shortly. Plans now being prepared include a manual arts and home economics building at San Jose; group of buildings at the Sonoma State Home, Glen Ellen; receiving and treatment building at the Stockton State hospital; three masonry buildings for the State Home of the Blind, Oakland; two cottages for the Berkeley State Home for the Blind; reinforced concrete cottage at the Napa State Hospital, Napa; and other small work. Mr. George B. McDougal, is State Architect and Mr. George Adams, Assistant State Architect.

New Work in Mr. Baumann's Office
Architect H. C. Baumann, 251 Kearny street, San Francisco, has moved to larger offices, necessitated by a constantly increasing clientele. New work in Mr. Baumann's office includes a $25,000 frame apartment house for Mr. F. Wilbur on 20th avenue, north of Geary; two flat buildings, one for Mr. John Schroeder at 26th and Dolores streets, and the other on 14th avenue for Mr. C. Littlepage; also two residences in Burlingame for Mr. H. Johnson, and six homes in 44th Avenue, San Francisco, for Messrs. Lyon & Hoag.

Residences and Apartments
Architect L. H. Ford, 306-14th street, Oakland, has completed plans for a two-story frame apartment house on Fruitvale avenue and Hopkins streets, Oakland, which will cost $15,000. The owner is Mrs. A. Zak. Mr. Ford is at work on plans for a bungalow court which will accommodate 48 families and which will be built in Alameda at an estimated cost of $100,000. Plans for several homes have also been made by Mr. Ford, including a $7000 house on Lakeshore Highlands.

Architect to Build Home
Mr. G. Albert Lansburgh, San Francisco architect, has bought a lot 51x132 on the north side of Pacific avenue, between Baker and Lyon streets, San Francisco, upon which he will erect a home for himself to cost not less than $50,000.

Forms Partnership
Messrs. James S. and Chas. L. Dean, who have had charge of the drafting room in connection with the new school work at Sacramento have formed a partnership for the practice of architecture with temporary quarters in the Free Public Library Building in Sacramento. They will complete the school work on hand and probably will be in charge of future school additions and extensions. They expect to let contracts in the near future for a five-story reinforced concrete warehouse on “K” street, between 6th and 7th streets, Sacramento, for the Breuner Company.

Apartment House and Alterations
Architect Nathaniel Blaisdell, 255 California street, San Francisco, has completed plans for a three-story brick apartment house to be built on Market street, near Guerrero, and to contain twenty-seven apartments of two and three rooms each. The estimated cost is $85,000. Mr. Blaisdell has also made plans for alterations and additions to a three-story Class “C” loft building at Clay and Battery streets, San Francisco, for Harriet D. Kittle.

Hearst Plans New Building
The five-story reinforced concrete building owned by the Sharon Estate at Annie and Jessie streets, San Francisco, has been purchased, together with the Builders' Exchange Building to the west, to provide room for the mechanical equipment of the Examiner. It is stated that the Builders' Exchange Building will be razed and a five-story structure erected on the site. Miss Julia Morgan is the architect.

Town Hall and Library Addition
Mr. Birge M. Clark of Stanford University, Palo Alto, has prepared plans for a $40 000 reinforced concrete addition to the Palo Alto Public Library building and a $20,000 addition to the Palo Alto City Hall.

Merced Hospital
Architect Ira W. Hoover, Planada, California, is preparing plans for a two-story hollow tile hospital for the Mercy Hospital Society at Merced.
Passing of Octavius Morgan

Mr. Octavius Morgan, one of the pioneer architects of Southern California, died suddenly of heart disease at his home, 819 So. Westlake Ave., Los Angeles, March 29. Mr. Morgan had been in apparently good health and spirits, having attended a meeting of the Allied Architects Association during the day and the theater in the evening.

Mr. Morgan was senior member of the architectural firm of Morgan, Walls and Morgan. He was born in Canterbury, Eng., Oct. 20, 1850. For two years after coming to the United States he was engaged in mining in Colorado, Wyoming, Idaho, Utah and Nevada, and in 1872 secured a claim on Lytle creek, San Bernardino county, California. In 1872 he moved to Los Angeles and became associated with Mr. R. F. Kysor in the practice of architecture until 1886, when Mr. Kysor retired. Mr. Morgan then formed a partnership with Mr. J. A. Walls and in 1910 Mr. Morgan’s son, Mr. O. W. Morgan, became a member of the firm. Mr. Morgan had for his clients many of Los Angeles’ most prominent citizens. His firm designed many buildings in Southern California, including the Sisters of Charity hospital, Hollenbeck Home for Aged, Farmers & Merchants National Bank, L. N. Van Nuys, W. P. Story, Hollingsworth, Title Guarantee, Haas and Stock Exchange buildings; Morosco theater, Van Nuys and Savoy hotels and The Little Theater.

Mr. Morgan was a leader in his profession and active in its affairs, being a Fellow of the American Institute of Architects. He was past president of Southern California Chapter and former director of the Institute; past president of the Engineers & Architects Association, member of State Board of Architecture; and was a Mason and Odd Fellow and member of California and Jonathan clubs.

$75,000 Apartment House

Architect Edward T. Foulkes, Crocker Building, San Francisco, has completed plans for a six-story apartment house to be built at Sutter and Taylor streets, San Francisco, for Mr. George Smith. Mr. Foulkes also has recently completed plans for two branch bank buildings for the Bank of Italy.

Hardwood Man Visits the Coast

Mr. George Strable, President of the Strable Lumber & Salt Company of Saginaw Michigan, has been spending the month in California, making his headquarters in Oakland, the guest of Mr. George Brown, President and Manager of the Strable Hardwood Company, of that city.

School and Residence Work

Mr. Henry C. Smith, Humboldt Bank Building, San Francisco, has quite a little school work on the boards, including the following:

School building for the San Lorenzo Grammar School District to cost $48,000.

Reinforced concrete school for the Glen Ellen School District to cost $35,000.

One-story frame school building for the Irvington School District to cost $40,000.

Mr. Smith is also preparing plans for a $20,000 country house to be built at Los Gatos, for Mr. Lewis Bruce. Plans have been completed by Mr. Smith for alterations and additions to the Bank of Hayward to cost $25,000.

Class “A” Building

Architect Sam Heiman of San Francisco has opened a Los Angeles office at 915 Loew State Building. Mr. Heiman is preparing plans for a 12-story class “A” store and loft building on the west side of Spring street, between Sixth and Seventh streets, to be erected for Dunn-Williams Co., of San Francisco. The upper stories will be subdivided into offices for large financial institutions. Maclonald & Kahn will erect the building which is to be completed by next January.

Union League Club Building

Plans have been completed by Architect T. Paterson Ross, 310 California street, San Francisco, for a seven-story and basement Class “A” club building to be erected on the south side of Post street, between Mason and Taylor streets, San Francisco, for the Union League Club. The building will cost $250,000. Mr. Ross has also completed plans for a large community apartment house and for several residence flats.

Miller & Warnecke Busy

Besides two brick business buildings to be erected in Paso Robles, and for which bids have been taken and contracts awarded, Architects Miller & Warnecke of Oakland, have prepared plans for residences costing from $5,000 to $15,000 each for Mr. A. Mageverstat at Rock Ridge Mrs. Carrie Onstott at Sutter, Sutter county, Mr. Neil Ross at Stockton, Mr. Ralph Belding at Guerneville and Mr. O. E. Gripp at Oakland.

Emanuel Sisterhood Building

Architect Julia Morgan of San Francisco, is preparing plans for a reinforced concrete and brick housing unit for the Emanuel Sisterhood. It will occupy a corner lot at Page and Laguna streets, San Francisco, and will cost $125,000. There will be accommodations for 60 girls.
Marine Architect's Invention

Mr. David W. Dickie, San Francisco marine architect, recently announced an innovation in marine bearings. In the new work launched by the harbor commissioners, now building at the Pacific Boat Works in East Oakland, he has eliminated the lignum vitae stern bearing and has "infused" rubber. Mr. Dickie claims to have tested the thing carefully. He says that he got the tip from oil drillers, who found rubber was not affected by sand. According to Mr. Dickie, the rubber bearing will make an enormous saving in installation, in wear and in periodical shaft withdrawal.

California Anti-Shingle Law

The wooden shingle men of California have been successful in securing the requisite number of names to their petition for a referendum vote on the so-called "housing bill" passed by the last legislature, which contained a clause forbidding the use of wooden shingles on roofs of buildings. In consequence, the bill which would have become effective on September 1, will remain inoperative until the people express their will at the November, 1922, election.

New Work in Meyer & Johnson's Office

Mr. Albin Johnson of Meyer & Johnson, Bankers Investment Building, San Francisco has recovered from an attack of influenza. New work in their office includes an apartment house at Herman and Buchanan streets for Mr. W. S. McLeod; three dwellings in San Rafael for Mr. James Hyde; a residence for Mr. William Scott and a brick firehouse in Forest Hill for the City of San Francisco.

New School Buildings

Architect William H. Weeks has been commissioned to prepare plans for an auditorium and gymnasium for the Exeter High School to cost $135,000; additions to the Exeter Grammar School to cost $88,000; a six-room and auditorium addition to the Los Altos School to cost $47,000; and a reinforced concrete auditorium and classroom building at Morgan Hill to cost $44,000.

To Complete San Francisco Hotel

Plans have been completed by Architect Kenneth MacDonald, 234 Pine street, San Francisco, for the completion of the five-story brick hotel at Mason and Eddy streets, San Francisco, owned by the Prior Estate and which has been left in an unfinished condition for a number of years. The original plans for this building were made by the late Earl B. Scott.

Architects Dined by Electrical League.

More than one hundred architects, builders and realtors were the guests of the San Francisco Electrical Development League at their luncheon in the Palace Hotel ballroom March 28. The close relation of these men to the electrical industry was emphasized by the various speakers and a closer bond of co-operation was argued.

Mr. Garnett Young, president of Garnett Young & Co., spoke on the necessity of minimizing the burdens of housekeeping by the installation of the proper equipment when homes are built.

Mrs. Halle De Graf, domestic science director of the Prune and Apricot Grower's Association, spoke of the necessity of electrical appliances in the home from the housewives' viewpoint.

Other speakers included: Mr. Clarence R. Ward, president of the State Board of Architecture, Northern Division; Mr. Henry B. Allen, vice-president San Francisco Real Estate Board; Mr. Alvyn Heyman, president Home Builders' Association; Mr. Charles W. Gompertz, secretary Builders' Exchange and Mr. Ray W. Kearney, attorney for the State Commission of Housing and Immigration.

To emphasize the necessity of outlet switches, a clever sketch was presented entitled "The Convenience Outlet."

Passing of Two Architects.

Architect James Osborne Craig of Santa Barbara, died recently at Ojai, following an attack of influenza. Mr. Craig was born in Glasgow and studied architecture in the Royal Academy, London. He came to Santa Barbara in 1915. He was engaged in preparing plans for the restoration of De la Guerra plaza, in Santa Barbara, as a public park at the time of his death.

Architect Fred T. Harris of San Bernardino, died suddenly at his home in that city of heart trouble resulting from an attack of influenza. Mr. Harris was born in San Bernardino in 1875. After graduating from high school he took up architecture and subsequently practiced in Redlands and El Centro, returning to San Bernardino in 1918. His widow and a son, Harwell, student at Pomona college, survive.

Architect to Build Home

Architect Jens C. Petersen, Peoples Bank Building, Sacramento, is preparing plans for a home for himself to be erected on 26th street, Sacramento, at a cost of $75,000. It will be of the bungalow type, brick veneer, seven rooms, two baths and garage. Mr. Petersen has completed drawings for the new Arbuckle Grammar School costing $75,000.
Los Angeles $5,000,000 Hotel
A contract was recently awarded to a Los Angeles firm to construct the new Biltmore Hotel for a sum in excess of $5,000,000—the largest single building contract ever let in the Southern City. A San Francisco contracting firm submitted the low bid but the owners thought best to give the job to a local concern which agreed to complete the building in the shortest number of working days. Schultze and Weaver of New York are the architects. With its fourteen stories of more than one and one-half acres each, it will contain 950 guest rooms and the most elaborate arrangement of lobby and service floors in the West.
Approximately 6,000 tons of structural steel will enter into the construction of this building. The electrical equipment of the hotel is estimated to cost $500,000 including elevators, ventilating apparatus, refrigeration machinery, wiring and other electrical devices.

City Planning.

At the February meeting of the Southern California Chapter, American Institute of Architects, Mr. Clarence E. Norenberg gave a talk on the work of the City Planning Commission, City Planning Association and Regional Plan Conference and urged the members to take a more prominent part in the work of these organizations. Mr. Sumner Hunt, president of the Chapter, and Mr. Chas. H. Cheney, city planning consultant, participated in the discussion. A resolution was adopted authorizing the executive committee to consider the appointment of a city planning committee.

Prof. D. V. Steed, instructor in mathematics at University of Southern California, gave a talk on the “Fourth Dimension.”

Says Los Angeles is Not Overbuilding.
Architect Edwin Bergstrom declares in an article published by The Realtor, that Los Angeles is not overbuilding but on the contrary must maintain an average of $60,000,000 worth of construction work each year for the next ten years to meet normal requirements. His statement is based on probable increase in population which he estimates will average 30,000 a year for the decade ending 1930 and the average requirements in building determined by actual increase in population and actual building done during the period from 1910 to 1921.

New Architectural Firm
Messrs. Ashley and Evers are a new firm of architects in San Francisco, with offices in the Holbrook Building. Mr. Ashley was formerly with Architect Smith O’Brien.

Personal.
Mr. Henry M. Greene, formerly of the architectural firm of Greene & Greene, 216 Boston Building, Pasadena, through office reorganization, has assumed entire charge of the business which will be continued at the same address under his name alone.
The firm of Mayo, Cowell and Bisell, associate architects and engineers, has been formed with offices in Stockton and Merced. Mr. A. E. Cowell, member of the firm is surveyor of Merced county.
Mr. W. C. Knighton and Mr. L. D. Howell have formed a partnership as architects and engineers, with offices in the U. S. National Bank Building, Portland, Oregon.

Mr. F. H. Ernest Walker, for a year past associated with Mr. Albert Farx, architect in the Foxcroft Building, San Francisco, has resigned to complete his architectural training in a tour of the United States and principal European Countries. At the conclusion of his travels Mr. Walker will practice his profession in Sydney, Australia.

Bank Addition and Hotel
Architects Ward and Blohme will be associated with Architect Herbert A. Schmidt in preparing plans for a $200,000 addition to the San Francisco Savings and Loan Building on California street, San Francisco.

Messrs. Ward and Blohme have also been appointed architects of a five story 150 room hotel at Marysville which is to be built this spring at a cost of $250,000.

Large Apartment House
Architect Edward E. Young, 251 Kearny street, San Francisco, has completed plans for a ten-story Class “A” apartment house having 63 apartments of two rooms each, to be built at Geary and Shannon streets, San Francisco, for M. A. Little. The cost is estimated at $250,000.

Market Street Building
Willis Polk & Company, Hobart Building, San Francisco, have completed plans for a two-story Class “C” reinforced concrete store and loft building for the Provident Securities Company. It will be built on the north side of Market street adjoining the Hobart building, at a probable cost of $36,000.

THE HUNGRY CARPENTER
The carpenter was hungry.
No wages could he draw.
"Alas!" said he, "no cents I see."
Then sharpened up his saw.
The carpenter was starving.
There was no doubt of it.
No food in sight. Without a bite.
He took a brace and bit.
—The Duluth
Cement Boycott Called Off
Wisconsin state highway department decided that more harm than good would be done by continuing its boycott on cement, and will accordingly proceed with its 1922 construction program. Wisconsin was one of the five states which agreed to purchase no more cement until a price of at least $1.30 per barrel could be obtained. Four hundred thousand barrels were secured at this price but 1,500,000 barrels will be needed for the current year. This has been purchased at an average price of $1.41 per barrel net at the mill; the average price paid in 1921 was $1.80 per barrel. In explanation of the department’s decision Mr. A. R. Hirst, chief highway engineer says: “The state highway commission feels that the fight has been carried as far as it is profitable to carry it and that any saving in the price of cement which might result from a continuance of the boycott will be far outweighed by the loss to the industry and to labor resulting from holding up the construction season about to open.”

Want State Cement Plant
The Arkansas Chapter of the American Association of Engineers has urged the Governor of that state to investigate the feasibility of building a state cement plant. The following resolution on the subject was adopted by the engineers’ convention:

“Whereas, the prevailing price of cement is entirely out of proportion to the price of other construction materials.

And, whereas, this abnormal price has the effect of retarding construction over the entire state.

And, whereas, the State of Arkansas has an inexhaustible supply of the best cement-making materials in existence.

Now, therefore, be it resolved by the Arkansas Chapter of the American Association of Engineers in Convention assembled that the Governor be respectfully requested to initiate an inquiry into the feasibility of building a state cement plant to be operated with convict labor, thereby securing, at a minimum cost, cement for use in public road and street construction.”

The same convention urged the development of the deposits of natural asphalt rock which exists in Arkansas, for road construction and expressed the opinion that “the present good roads and public works construction progress is being hampered by excessive freight rates.”

Reno Hotel
Architect F. J. De Longchamps is preparing plans for a five-story hotel to be built in Reno for Mr. George Wingfield.

San Francisco to Entertain Engineers
At a meeting of the Board of Directors of the American Society of Civil Engineers held in New York City recently, it was decided to hold the autumn meeting, not only of the Board of Directors, but of the entire Society, in San Francisco on October 18, 19 and 20, 1922. The meeting will be devoted to a Symposium on Water Power. After a two-day session devoted to technical papers and discussions, an excursion will be made to one of the power projects in the Sierra Nevada Mountains. San Francisco is represented on the directorate of the Society by Messrs. Walter L. Huber, director for Northern California and Nevada, and C. E. Grunsky, who was elected vice-president at the January meeting.

Engineer Brings Suit
Mr. W. B. Larkin, former city engineer of Tracy, has brought suit against the trustees of that city for $8000 alleged damages due to the cancellation of an agreement to employ him for all engineering and inspection on certain street work at 6 per cent of the contract price of the work, which was estimated to be about $200,000. Mr. Larkin claims that after he had submitted his recommendations on the proposed paving, the resolution adopted by the board of trustees authorizing his employment was rescinded. This action he claims discharged him from his duties without reasonable notice and without a hearing.

To Investigate Water Resources.
Four leading hydraulic engineers of California have been called into consultation by the State Department of Engineering to advise the department in its study of run-off of the water sheds of California in connection with the survey of the water resources of the State, provided for by act of legislature. They are: Mr. C. E. Grunsky of San Francisco; Prof. C. D. Marx of Stanford University; Mr. Louis Hill of the firm of Quinton, Code & Hill, Los Angeles; and Mr. H. D. McGlashan, district engineer of the Water Resources Board of the U. S. Geological Survey. A study of the run-off of 95,500 square miles of watershed is contemplated, extending the comparisons over a period of 50 years.
Builders Exchange New Officers

Mr. William H. George, manager of the Henry Cowell Lime and Cement Company, has been elected president of the San Francisco Builders' Exchange, succeeding Mr. Charles W. Gompertz, whose term had expired.

Other officers elected for the ensuing year are: Messrs. D. J. Sullivan, first vice president; Joseph B. Keenan, second vice president; George Bowen, third vice president; R. J. H. Forbes, secretary, and Alexander Mennie, treasurer.

The board of directors, who will have charge of the affairs of the exchange for the coming year, are: Messrs. W. H. George, D. J. Sullivan, Alex. Mennie, J. D. McGilvray, Joseph B. Keenan, George T. Bowen, Charles W. Gompertz, C. G. Berg, R. J. H. Forbes, Thomas Campbell and J. Hart.

Long Beach Building Code.

A new classification of buildings will be made in the redrafting of the Long Beach city building code, now under way. Under the existing code, four classifications are recognized, designated as Class A, fireproof; Class B, steel or reinforced concrete interior frame with wood floors; Class C, masonry walls and wood interior; Class D, wooden buildings. The new classifications will be as follows: Strictly fireproof, steel skeleton or reinforced concrete; semi-fireproof, masonry buildings with wooden interiors and wooden buildings. The new classification is that used in many eastern cities.

Partnership Dissolved.

The firm name of Edelman & Barnett, architects, has been changed to A. M. Edelman, architect, and the office has been moved to 726 H. W. Hellman building, Los Angeles. Mr. A. C. Zimmerman is associated with Mr. Edelman as architect and engineer.

Oakland Theater Steel Contract

Although San Francisco and the Bay cities are already well supplied with structural steel contractors, a Los Angeles concern has been awarded a contract for furnishing the frame of the new Fox theater and office building in Oakland. The figure at which this contract was let has not been made public.

It Pays to Advertise

A Western evangelist makes a practice of painting religious lines on rocks and fences along public highways. One ran: "What will you do when you die?"

Came an advertising man and painted under it:

"Use Delta Oil. Good for burns."—The American Legion Weekly.

H. T. James Retires.

Mr. H. T. James, one of the best known paint and oil manufacturers on the Pacific Coast, has retired from active participation in the management of the Bass-Hueter Paint Company, now owned by the National Lead Company, after 29 years of active service. Mr. James is succeeded as vice president, by Mr. J. B. Kelster and as general manager by Mr. L. M. Ducommun. Mr. James retains a directorship in the company.

Class A Building.

Architect C. M. Hutchison, 427 Security Building, Los Angeles, has completed plans for a 6-story and basement class A store and office building at southeast corner of Sixth and Lebanon streets, for Mr. John L. Richardson.

Class A Theater.

Architect E. J. Borgmeyer, 1068 California Building, Los Angeles, has completed plans for a 2-story and basement building at southeast corner of Pico street and Norton avenue, for Forum Theater Corporation.

Whittier Church.

Architect Robert H. Orr, 1301 Van Nuys Building, Los Angeles, has completed plans for a two-story and basement brick and plaster church building, at Whittier for the Whittier Christian Church.

Class A Building.

Architects Morgan, Walls & Morgan, 1124 Van Nuys Building, Los Angeles, have completed plans for two class A buildings, to be erected on Boyle Avenue, for Hollenbeck Home.

College Building.

Architect Robert H. Orr, 1301 Van Nuys Building, Los Angeles, is preparing working plans for the new zoological laboratory building, for Pomona College at Claremont. The building is being donated to the college by D. C. Crookshank of Pomona.

Designing Church

The building committee of the Swedish Methodist Church has commissioned Architect Anton Johnson, to prepare plans for the proposed $75,000 new church building. Rev. C. H. Sundstrom is pastor of the church.

$165,000 Garage

Architects O'Brien Bros., of San Francisco, are designing a five story reinforced concrete commercial garage to be built at Ellis and Mason streets, San Francisco, for the United Garage Company.
No. 4 of a Series of

STANLEY
SPECIFICATIONS ON
Ball Bearing Butts

DATA:
Built for unusually heavy work, this butt is recommended for heavy iron doors. Made of cold rolled steel, without holes. Leaves can be cut off to suit special requirements. It is equipped with four Stanley non-detachable, weather protected ball bearing washers. Loose pin has the Stanley non-rising and self-lubricating features. Inner edges beveled. Corners are square. Edges of leaves are clean and even. Stanley Sherardized finish is recommended for exterior use. The class number (851) is stamped upon the back of leaf near joint.

Made in following sizes:
6" x 4"  7" x 6"
6" x 5"  7" x 7"
6" x 6"  7" x 8"
6" x 7"  7" x 10"
6" x 8"  8" x 6"
8" x 8"  8" x 10"

We showed specifications on BB239, BB252 and BB170 in previous issues of this publication. Will gladly forward them, if you wish to keep series complete.

The Stanley Works

NEW BRITAIN CONNECTICUT
NEW YORK CHICAGO SAN FRANCISCO
LOS ANGELES SEATTLE
Manufacturers of Wrought Hardware and Carpenters' Tools

When writing to Advertisers please mention this magazine.
The Contractor

BRASS TACKS*
By GODFREY EDWARDS
Pres. Edwards, Wilder & Dixon Co.,
Los Angeles, California

BEFORE I begin, I have a brass tack for Mr. Channing and I didn't have the opportunity of handing it to him, although I was very much enlightened by his remarks. I noticed one thing he spoke of in the Automobile Show in New York. There were sixty-six models of automobiles and that was mentioned as an example of waste in industry. Gentlemen, to my notion those sixty-six models denote first of all, competition, and for God's sake (and I say it reverently) don't let's destroy anything in this day and age that enforces competition.

My tack is in this form, Mr. Channing. If we standardize automobiles to say, six standard patterns, why not standardize clothing for instance? There is only one institution that I know of that standardizes clothing and that is the penitentiary; there it is all the same. Why not go a little further and standardize jewelry? Now you fellows pretty nearly all have a ring; I've got two of them. Those rings mean something; perhaps your wife gave one to you, or your little girl; perhaps it is a Shrine ring or something. Why not standardize and have only six kinds of rings? I have noticed some of these wealthy contractors from the East have very elaborate rings. I noticed one, a black shield with a diamond in the corner. I have never seen that in California. Then suppose you take the clothing of our poor men. It is pretty well standardized compared to the ladies' clothing, but you know we men have one dissipation, that is our neckties. I came here with a real gay fellow, but Mrs. Edwards made me change it. How about three fabrics and six patterns? That is just a good natured tack and I am sure it reached Mr. Channing right end to. But I think that we can carry this standardization a little too far.

For instance, take it in a florist's business. Why not standardize flowers in the florist's business and have six flowers for summer and three for winter? That ought to satisfy your best girl or your wife when she is going to the theater or something of that sort. Isn't it a fact that certain fellows buying automobiles like to get something out of the ordinary and isn't it a fact that it stimulates that sort of men?

When you all come to Los Angeles next year you will find among other industries, you know, the movie industry. Now of course there are one or two stars that I am not going to mention, who get a lot of money, and you gentlemen contribute pretty largely to it. They like to have an automobile that you and I can't afford to buy. Why not let 'em gratify that little vanity? It is a good deal less inimical than some of the other pursuits they follow. Why not let them indulge that and why not let the manufacturer back in South Bend, Indiana, or wherever the Cadillac or Packard is made, indulge in making that special model? Suppose it is in a way a waste, the mechanic that makes it gets paid for it, and I presume he is a class of workmen that gets paid a little more than the man who makes the Ford, for instance, which is very much standardized. But I think, gentlemen, we really can carry this elimination of waste a little too far.

We have all got to be doing something and if a man makes rings, why not let him indulge his fancy and make a real nice one that will catch your eye as you go by the shop? Maybe you wouldn't buy one of those six rings.

When I was a boy a good many years ago, the Polk Manufacturing Company of Connecticut brought out a bicycle with an elliptical sprocket. The bicycle magazines were then filled with articles, more or less scientific, proving that the elliptical sprocket was a great advance in bicycle production, because of more power at the critical moment when the foot came down and a quicker recovery to exert that power. All the bicycles that I know anything about today, however, are made with round sprockets.

About eighteen years ago in California, there was devised a method of economical road paving which consisted of plowing up the old roadway, pulverizing, watering, putting on oil, harrowing the oil in and then rolling it with a tamping roller. Immediately the road magazines of the country were covered with articles trying to demonstrate that we had a wonderful new method of economical road making. Today there is not a road engineer of any description that would even listen to such a method of building a road.

WHAT ARE FADS OF CONSTRUCTION?
That elliptical sprocket and the patro-
We manufacture

Wire Work

Window guards.
Overhead guards for Elevator Shafts.
Skylight Covers.
Cooler Shelves.
Protection guards for Sidewalk Doors.
Machinery safety guards.
Auto Truck Enclosures.
Partition Screens for Offices, Garages, Warehouses, etc.

Michel & Pfeffer

Tenth and Harrison Streets
SAN FRANCISCO

What is your valve standard?
Most any valve will work well when new, but it takes a high grade product to stand up for a long period of years and to continue to give one hundred per cent efficient service. That's why architects, engineers and contractors should safeguard the future interests of clients and customers by specifying

Kennedy

In this way their specification carries with it the protection which the KENNEDY name and KENNEDY guarantee insure to valve users. For 44 years valve satisfaction has been the one object of the KENNEDY organization, and the improvements and developments which mark all valves bearing their trademark are sufficient proof of the success of their efforts.

The special features of Kennedy Valves are given in our latest catalog. Send for copy and keep it handy.

The Kennedy Valve Mfg. Co.

Branch Offices and Warehouses:
NEW YORK, 95 John St.
SAN FRANCISCO, 23-25 Minna St.
BOSTON, 17 India St.
CHICAGO, 204-8 N. Jefferson St.

Sales Offices:
Salt Lake City, 503 Dooley Bldg.
El Paso, 704 Two Republics Bldg.
Seattle, L. C. Smith Bldg.

When writing toAdvertisers please mention this magazine.
lithic pavement were fads and fancies. What about the fads and fancies of our own construction industry? For the last four or five years we contractors have been fed up with cost plus a percentage contract, later modified to cost plus a fixed fee, and still more latterly modified to guaranteed cost plus a fixed fee, or a fee with a sliding scale—a profit or loss sharing, according to whether the estimate exceeded or was less than the original estimate.

We hear a good deal also about quantity survey furnished by the owner. That has merit if one can get a guaranteed form of survey by a licensed bureau which would be supervised in some such way so that there would be no opportunity for malpractice, and so that the contractors would know they were all treated alike.

It is my prediction that within five years the cost-plus-whatever-you-fancy, and the quantity estimate furnished by the owner will be thrown into the discard together with the elliptical sprocket and the petroliptic pavement. They are at the present day fads and fancies of construction.

What is a General Contractor?

My personal definition of a general contractor is a man or a firm that will deliver a finished structure in a certain definite time for a certain definite sum. Is a construction engineer running a job for an owner on a fixed salary, an engineer or a contractor? Is an architect running a job on segregated bids for a 10 per cent fee or more an architect, an engineer or a contractor? Is a concern with a force of construction engineers and an office force and a lot of machinery and equipment attempting to do big operating work all over this country, an engineer or a profiteer, a general contractor or a general nuisance?

Our Greatest Danger

Are the big men of our industry who are trying to popularize the cost-plus system doing our business good or doing it harm? Why is it—and this is the experience on the Coast—that concerns doing that business are almost invariably left at the post when they enter the competitive lump sum competition?

What is the greatest danger facing our business today? Is it not the expensive fad of conducting public work by force account? That is a very grave danger today on the Coast.

What is the chief contributory cause of that condition? Is it not the propaganda of the cost-plus contractor? Assume a typical county in any State or a typical city council or a typical harbor board. In Los Angeles we have a harbor board which will spend about five million dollars in Los Angeles this summer. Begin with that typical county, that has in the past, we'll assume, been doing our work under competitive bids. Assume one of these construction engineers who have been working a couple of years or so for a cost-plus concern and who on account of the slackness of the times or perhaps some little unpopularity of that method in his particular location, is out of work. Imagine that he gets a position in that typical county as assistant county engineer in charge of construction. Imagine the host of machinery salesmen and equipment men crowding that fellow's office to sell him the latest equipment. Can't you almost hear the arguments that are made as to the saving to be effected by that unfortunate county by letting that engineer do that work at the actual cost of labor and material plus the insignificant pro rata of the salary of that construction engineer? Doesn't that make a pretty good academic argument?

Imagine the zeal of that fellow. He has been trained in this thing and he is perfectly conscientious about it, and he thinks he is just as good a contractor as you are. Imagine his zeal in exemplifying that to that county. Can't you see that practically every argument that the cost-plus firm can employ with an owner for private work is applicable in equal degree to a board of county commissioners? We must remember when a county or any other body builds up an army of contractors it is a pretty good thing to have around election time. There are additional arguments to let that county engineer run that public work. You can not foster the one, and by that I mean the contractor doing cost-plus work, without fostering the other. You can't destroy the one without destroying the other.

Should I add that the cost-plus contractor is pulling down with one hand the very structure that he is helping the rest of us build with the other hand? I maintain that the cost-plus contractor is doing that very thing—unintentionally but nevertheless very certainly—destroying the structure of general contracting with one hand and helping the rest of us attempt to build it up with the other.

A—What Is a Fair Profit?

I've got just four exhibits that are going to make the cost-plus fellows wiggle a little bit in their chairs. I will start out with Exhibit "A." First of all we hear this argument in favor of cost-plus: that while it may not show such a big profit as the lump sum it is a certain profit and a fair profit. In the city of San Francisco the cost-plus-a-fixed-fee has been very popular. The building for a prominent railroad line was built there by one
"One Room into Many, Many into One"
as applied in the Lafayette Presbyterian Church, Buffalo, N. Y.
Clark & Arms, Architects

WILSON

Standard for Forty-Six Years

Folding and Rolling Partitions

FOR CHURCHES, SCHOOLS, OFFICES, Y. M. C. A. BUILDINGS
HOTELS, CLUBS AND OTHER PUBLIC INSTITUTIONS

For easy and instant subdivision of large rooms Wilson Partitions are standard. Prices have been reduced as much as possible.
Wilson Sectionfold Partitions are made to harmonize perfectly with interior decoration, new or old. Have every appearance and advantage of solid, permanent wall, yet at will disappearing, folding into small space, practically out of sight.

Wilson Rolling Partitions are lower in price than Wilson Sectionfold Partitions. Used where decorative adaptability and permanent appearance of the Folding Partitions are not so important. Their practical advantages have placed them in more than 39,000 churches, schools and public institutions.

Write for details of Folding and Rolling Partitions or any of the Wilson products. Wilson details and specifications in Sweet’s Catalogues

The J. G. Wilson Corporation

Pacific Coast Office and Factory
621 NORTH BROADWAY,
LOS ANGELES, CALIF.

Waterhouse-Wilcox Co., San Francisco
Theo. F. Snyder, San Diego
S. W. R. Dally, Seattle
F. W. Farrington & Co., Portland
Walter Dubree, Phoenix
Hawley-Richardson-Williams Co.
Salt Lake City
of the best contractors in San Francisco on a flat fee of practically 2 per cent. I maintain if that firm gave that building the attention that they should give it, if they sat up nights with it and gave it the best that was in them, 2 per cent did not adequately represent a fair profit on a contract of that magnitude, although I believe other buildings have been done since on about the same percentage. This is a little tack about getting a fair profit, but eliminating the gamble, you know.

B.—ELIMINATING TROUBLES

Now Exhibit "B." A certain utility company in Los Angeles decided to build an office building of ten stories and one contractor, who was becoming very much infatuated with the cost-plus system, went to the owners and to the architect and persuaded them that the only logical way to build that thing was on a fee. He mentioned this argument which I have heard before: That it eliminated all possibilities of quarrels between the architect and the contractor—the contractor trying to skin every little thing and the architect trying to get the advantage of the contractor on every little thing. He made quite an impression on that architect and on that owner so that they sent out requests for bids on the amount of fee that we would build it for. That is the only time I came very near being a cost-plus contractor. I reluctantly confess I put in a bid. My bid was 6 per cent. I found out afterwards there were bids as low as 3½ per cent. But the trouble was that the other bidder had educated that architect a little too well. The architect was impressed with that argument about no trouble with the contractor; but he went a step further. He thought by eliminating the contractor altogether he was sure of eliminating all the trouble, so he hired one of the junior engineers of one of the principal contractors in Los Angeles and the architect built the building himself. The engineer that ran it got $300 a month.

C.—SOME SIMPLE ARITHMETIC

In one case, a contractor had secured a nice contract, about $200,000. The work was turned over to a young man who had been working three or four years for one of the large eastern firms which did war work on a cost-plus basis. He built a good building, and the owner was thoroughly satisfied. In order to further cement the friendly relations which secured the job, the contractor furnished the owner all his receipted bills from all the sub-contractors, from all the material men, his pay rolls, etc. This was very nice, but six months after the building was completed the owners decided to duplicate that unit and they went to the same contractor. Did they give him the job? They did not. They went to his office and they hired that young man who built the other building for $400 a month and he built it.

Those owners were educated to the name of every satisfactory sub-contractor, to the name of every good material house, and to the prices to be paid. What a very simple process of elimination to say, "We paid you 7½ per cent, on $200,000 and now this young man will build us that unit for $400 a month."

Very simple arithmetic.

D.—THE CONTAGION SPREADS

One advantage of the cost-plus contract very recently brought to my attention is that it enables the owner to proceed with the excavation, the foundation and the first floor while the architect is working up the remainder of the building, and thus saves rentals. This is a fine argument presented not only to me—but to every large property owner who is thinking of building in Los Angeles.

And it gets all over the state, because your state engineer is in touch with the big interests there the same as they are in Cleveland, I suppose. So the State of California, about two years ago, was importuned by the authorities on insanity in California to very largely extend our hospitals for the mildly insane. A good many boys suffered from shell shock, and, of course, our population has been growing rapidly and we have to increase facilities in all lines. So the State Hospital at Norwalk, near Los Angeles, was inadequate to take care of these additional victims of shell shock and mild cases of insanity.

Of course, our boys were on the job and we got in touch with the state engineer and again the usual methods to hurry up the building, get it started, were pursued. There was very, very serious need of it.

The state engineer told us that he had decided, in order to save time, that they would do it by force account, because they could be putting in the foundation and putting on the first floor joists while the state engineer's architectural bureau, which, by the way, has 40 employees in it, were perfecting the rest of the building.

These are my four exhibits, and they are all very largely the results of the propaganda of the cost-plus men.

PUBLICITY AS A DEFENSE

Of course, gentlemen, we have our weapons for combatting such things. The greatest weapon, of course, is publicity—facts; in other words, brass facts—facts as to the difference between engineers' estimates, and by that I mean the difference between the public official's estimate of the cost of an operation and the final result; facts as to ability and wide experience, sometimes dearly bought
Entrance of Resi’ence, Evanston, Ill. Perkins, Fellows & Hamilton, Architects

One of many exquisite effects the architect may secure by using just standard sized brick in his wall designs. The three rows of headers at the side of the door, separated by a Flemish course laid vertically, are especially worthy of notice.

Architectural Details in Face Brick
SERIES II AND III

We have now ready for distribution Series II and III in the Portfolio of Architectural Details in Face Brick. The collection now embraces over a hundred de luxe half-tone plates. Each series is assembled in an enclosed folder, with printed tab, ready for filing.

Many architects who received Series I, have expressed themselves as delighted with the beauty of the plates and their richness in suggesting the artistic possibilities of brickwork. A set of these folders will be sent to any architect requesting them on his office stationery, and his name will be placed on the list for future mailings.

AMERICAN FACE BRICK ASSOCIATION
1159 WESTMINSTER BUILDING • CHICAGO, ILLINOIS
by some of us in the purchasing department; facts as to overhead; facts as to the depreciation of the state machinery and equipment; facts such as comparison of costs on similar jobs that have been built under competitive condition. That is what we all use to explode the delusion of doing public work by force account.

**QUANTITY SURVEY**

Touching very lightly, because I know it’s going to be brought up again, the question of quantity survey furnished by the owner, I am going to ask you again, what is a general contractor? Have we any functions besides putting on an apron with nails in one side and a hammer on the other? We feel this way: If a contractor wants a job, it’s up to him to figure it, it’s up to him to go after it right; and if he can’t go after a job right unless he takes off his own quantities in such a way that he can back them up with his pocketbook.

**PROFITS NECESSARY TO CONSTRUCTION**

I want to say just a word in deference to the program as to recanted construction. Before we can go into the remedies for delayed construction, we’ve going to look earnestly and very frankly into the causes. Personally, I look at all these various special aids to promote private construction as purely ephemeral, and, while I think they are well-intentioned, I think they are more harmful than beneficial in the long run.

Construction will go ahead logically and will go ahead full swing when the man who puts his money into it feels that it is safe and profitable to put it in and not until then. Why doesn’t he feel safe now? Why doesn’t he feel that it is profitable now? Well, the man who wants to build a home, or the man who wants to build a building for income, thinks that construction costs today are too high. Of course, we have heard that argument before. He very strongly suspects that the reason they are too high is because the subsidiary associations controlling the material that goes into those buildings are too well organized.

Our function for this year is to look into that. If that suspicion is well-founded, we must get after it. If that suspicion is not well founded, it is our business to dissipate it and disabuse the minds of the investing public of that fact.

"BY COMPETITION, DEADEN INDUSTRY"

I believe in competition. Whatever little success I have had, I have achieved in competition. I don’t believe you can destroy competition. I don’t believe you can hamper it without stultifying the industry you are in. I believe that trying to control competition has brought about very largely the conditions we are here discussing this afternoon.

To illustrate that: A friend of mine recently said that the best offer a rancher could get about a month ago from the packing houses on sheep was $3.50 a head. I am telling this to you just because the packing industry is so very well organized, based on the argument that by organization they can cheapen the product. You know there is nothing left of a pig, not even the squeal, after they work up the by-products. Thus, they should be able to slaughter cattle and sheep much cheaper than the little country abattoir. The same day my friend was complaining about the low quotation for his sheep. I had to buy some mutton there at 50 cents a pound. That is a good example of organization, and you don’t need a chart of statistics to illustrate it, either. The next day the Los Angeles Times came out with the statement that the retail butchers, however, complained that 40 per cent less meat per capita was consumed by the people of Los Angeles than before the war.

**COMPETITION OR SOCIALISM?**

In Los Angeles in the last two years there have been literally thousands of temporary houses built. The real name of them is garages. We really call them shacks and people say it is real cute to live in a garage in the back of the lot. I’m going to come back to that in a minute.

If we are going to do away with competition and put co-operation in its place (and you all know, of course, what cooperation by the average material association is), we are going to get one of these results: Either the people who are not in these associations are going to learn to do without or do with less. That is exactly what they are doing today in your city and mine—they are eating less meat per capita, driving less milk per capita; they are wearing poorer clothes and many are living in temporary houses. That is one result.

---

**A. QUANDT & SONS**

ESTABLISHED 1880

**PAINTERS AND DECORATORS**

SAN FRANCISCO

LOS ANGELES

Office and Shop

374 GUERRERO STREET
San Francisco

PHONE MARKET 1769
When you replace the rusted-out gutters

Be sure the new gutters and leaders are galvanized "Armco" Ingot Iron—the rust-resisting iron.

You may pay a little more for it, but it will pay you in many additional years of service. If you divide the cost of ordinary gutters by the number of years they last, you will probably find that they are more costly than expensive metals used for this purpose.

"Armco" Ingot Iron is practically pure. The impurities in ordinary metal that tend to create the condition we call rust have been removed by a special process.

The dense, close-grained surface of "Armco" Ingot Iron takes a coat of galvanizing and holds it. Even where the metal is bent and shaped, the galvanizing does not crack and peel. For this reason "Armco" Ingot Iron is admirably suited for all hot-air furnace pipes and casings. Its ductility enables the workman to form it easily into all required shapes.

Use "Armco" Ingot Iron on the home for gutters, leaders, cornices. If you buy a furnace, be sure the sheet metal parts are "Armco" Ingot Iron.

For further information write to

THE AMERICAN ROLLING MILL CO., Middletown, Ohio

When writing to Advertisers please mention this magazine.
The other is that bye and bye the people will get tired of making these continual sacrifices and will rise up and break up all these associations; else they will take control of the industries themselves. That means Socialism pure and simple. It is what we are drifting into very rapidly unless we put competition in its old place as a controlling element.

**ORGANIZATION IN CONSTRUCTION**

By COL. EVAN SHELBY
(Formerly Legal Adviser to the Construction Division U. S. Army.)

Before the world war, I had a rather hazy idea of the business of Contractors. It had seemed to me to consist principally of inducing public officials with very little previous information, to give some individual who had small financial responsibility and perhaps very little construction experience a large job at a very high figure which would permit of enough profit to divide with the politicians and still leave a fairly large return to the fortunate "best" bidder.

My views have changed since then. I know now what an important part the construction industry plays in the life of our Country. Next to farming it is the basic industry of the Nation. It is the foundation stone of manufacture, transportation and nearly all urban life.

When we entered the Great War our lack of preparedness was nowhere more acute than in the matter of construction. There was no such thing as an Organized Construction Industry. Some of the allied professions such as engineering and architecture were organized, but the Contractors, the people who really do the construction work of the country were practically without organization, in fact they were the most highly competitive class of all of our commercial life. The need for the entire output of all of our construction forces was immediately brought home to the Government. The Army and the Navy, the agencies through which the industrial life of the Nation was to be changed from peaceful to war-like purposes, found at the very outset that the old methods by which Contractors were competing in huge gambling operations where risk of complete failure was usually the price of getting a job, would not produce the Government requirements and allow us to become the turning factor in the War. They could not risk failure on their important jobs even if the Contractors were willing to take the risk of being entirely wiped out.

The work had to be done, and the thing which confronted those responsible

---

*Address delivered at the National Convention of the Associated General Contractors, Cleveland, Ohio, January 19, 1922.*
ROSENBERG APARTMENTS
Taylor and Geary Sts.
JOSEPH CAHEN, Architect

—a well designed apartment house

Face Brick
Enamel Brick
Paving Brick
Fire Brick
Hollow Building Tile
Roofing Tile
Mantel and Floor Tile
Atlas White Cement

Insures prompt and steady rental—Satisfies the owner, lessee and the tenant.
An attractive exterior is invariably the rule with a well designed building

LIGHT GREY PRESSED BRICK
Gives the Rosenberg Apartments a Refined, Rich Appearance

UNITED MATERIALS COMPANY
Sharon Building
SAN FRANCISCO

REPRESENTING
RICHMOND PRESSED BRICK CO.  LOS ANGELES PRESSED BRICK CO.

When writing to Advertisers please mention this magazine.
Uniform in Quality

MADE by accurate, machine methods, inspected and graded according to fixed standards, American Window Glass Co., products can always be depended upon to be uniform in quality, in thickness and in strength. Open one box or fifty of the same grade and weight, and every light will match every other. A second shipment will match the first.

Highest Standards

First, second and third quality are comparative terms. The grading standards used in American Window Glass Co. factories surpass any others in use in the United States. Our "A" quality lights (seconds) are hardly distinguishable from from "AA." Our "B" quality (thrids) are practically as clear as ordinary second grade. And for your protection the grade marking is branded on the end of every box—make sure that this marking has not been changed.

See Sweets Architectural Catalogue for details of our grading standards

AMERICAN
WINDOW GLASS CO.

GENERAL OFFICES  PITTSBURG, PA.

Branches in Principal Cities

be found ample reason for the existence of this Association. If you can persuade the industry as a whole to adopt a form of contract which would be standard, you will have done immeasurable good to the Country. A basic uniform contract, which shall gradually receive judicial interpretation which will be recognized in all Courts in all States, will eliminate untold waste in the countless litigations which grow out of mere variety in form of construction contracts.

Progress in legislation dealing with the Construction industry requires combined effort to accomplish. Joint effort not only iron out the differences in the industry itself, but produces the desired effect upon those whom we call to legislate for us. Construction Contractors are responsible for the expenditure of such enormous sums of money—nearly four billion dollars a year—that they should be organized in a way to deal most beneficially and effectively with the collective groups from whom they must buy the labor and the materials for their work.

Public opinion is one of the largest assets in any industry. To direct and properly influence public opinion is particularly the function of organized endeavor in such industry. It is not half as important that Contractors as such should make large profits for themselves as it is that the great construction industry should be right—that is that it should be conducted on the highest principles of fair dealing and efficiency, and that the world should be made to know that Construction Contractors are not just gamblers on how much a piece of construction work will cost, but are producers—are industrial workers who are rendering to the public the highest class of skilled professional and managerial service.

The A. G. C. has undertaken a work which I venture to prophesy will have as fine a result in the commercial life of our land as any Association of the best in any line of endeavor has ever set as its goal.

Stockton Architect Busy

New work in the office of Architect Glenn Allen, Stockton, includes a two story brick apartment house for Mr. Louis Jacobs estimated to cost $40,000; a $40,000 brick residence for Mrs. George Dorman and a two-story reinforced concrete arcade, 100x200 for a corporation headed by Mr. L. A. Mills. The arcade building will cost $200,000.

Fraternity Building

Architect W. R. Yelland of Oakland, is preparing plans for a $25,000 two-story frame fraternity building for the Theta Chi Fraternity.
Interior and Exterior of Market and Jones Streets Branch Anglo-California Trust Building, San Francisco. H. H. Winner Company Designers and Builders

Electrical Engineering and Installation by Rex Electric & Engineering Company.

RADIANTLIGHT FIXTURES
Installed Throughout the Banking Rooms of This Modern Banking Structure

Other banks designed by Mr. Winner and equipped with Radiantlights, include the Sixteenth and Mission Street Branch of the Anglo-California Trust Co., Commercial Savings Bank, Stockton and Merchants National Bank, Sacramento, Modesto Bank, Modesto.

Electric Appliance Company
807-809 MISSION STREET
SAN FRANCISCO
Specify—

D. F. Panel Boards

and insure your client an efficient, economical, safe installation for electrical control.

The picture shows the D. F. Push Button Panel Board with Door and Trim.

Previous illustrations of this Panel Board showed (1) as it looks on the wall, (2) as it appears with the center door only open and giving access to the push button compartment. Next month’s advertisement will show the board without the trim.

Safety Electric Company

Samuel H. Taylor, Proprietor

59 Columbia Square
San Francisco

Tests of Road-Building Materials

An experiment to determine just how hard rock or gravel must be in order to be satisfactory for use in building concrete roads, is being carried on by the Bureau of Public Roads at the Arlington Experimental Farms of the United States Department of Agriculture. About 60 sections of experimental road are being constructed, in which practically every variety of stone, gravel and sand will be used. These sections will then be traveled over thousands of times by a machine automatically operated and which has the same effect on the pavement as a motor truck. This will continue until the wearing properties of all the sections are determined. The bureau believes that the results of these tests will show that many local materials heretofore deemed unsuitable may be used safely in building concrete roads, thereby saving the cost of importing stone, gravel, or sand from a distance.

Architects for Safety in Building

The Oregon State Board of Architect Examiners in conjunction with the office of the State Fire Marshal has made an appeal to the architects of the state to cooperate with them in enforcing the provisions of the state laws and orders of state officials relating to the regulation of building construction, which provide for greater safety to life and property from fire and accident. The State Board of Architect Examiners requests that all plans for buildings to be used wholly or in part as places of public assembly of any character, including schools, dormitories, hotels and apartment houses, be submitted to the State Board of Architect Examiners or to the office of the State Fire Marshal for suggestions as to public safety.

Standardizing Paving Brick

Elimination of 59 varieties of paving brick, reducing the styles and sizes from 66 to 7, is an illustration of what may be done in the way of standardization when a real effort is made. Through the division of simplified commercial practice of the Department of Commerce, which is helping manufacturers to eliminate waste in their business, the number of varieties of paving brick was reduced last fall from 66 to 11. A further reduction to 7 varieties has just been made. The last four types eliminated comprised 10 per cent of the total shipments of paving brick in 1921.

Removal Notice

Arthur Priddle, Public Quantity Surveyor and Estimator, has removed his offices to Room 606, Williams Building, San Francisco.
STUCCO has deservedly become a most popular type of construction. One essential of good stucco is that it be permanent.

Stucco properly made from Atlas White Portland Cement is as permanent as concrete, because it is concrete. It has been proven satisfactory through years of exacting use. A wide variety of pleasing finishes are shown in our book, "The Stucco House," a copy of which should be in every architect's hands.

For over a quarter century Atlas Portland Cement has been deservedly known as "the Standard by which all other makes are measured."

The panel, a strip 60 inches deep, from an actual wall shows a rather dry mix applied with medium pressure and motion of the trowel. Permanent finishes such as this are only possible with Portland Cement Stucco.

THE ATLAS PORTLAND CEMENT COMPANY
NEW YORK - BIRMINGHAM - CHICAGO
Pitts. - Philadelphia - St. Louis
Denver - San Francisco

ATLAS WHITE PORTLAND CEMENT IS AVAILABLE IN ANY QUANTITY THROUGH MOST DISTRIBUTORS OF BUILDING MATERIALS.
Automobiles Increased 1,000,000
With returns received from all states, the U. S. Bureau of Public Roads reports that the motor vehicle registration for the year 1921 totalled 10,448,682. This represents an increase of more than a million over the 1920 figures, or a number equal to the total number at the beginning of 1913. The greatest increases in registration were in industrial sections, the agricultural sections in general showing a smaller amount of increase. No state reported a registration less than the 1920 figures. The total amount collected as fees of various kinds amounted to $122,478,654. It has been expected that the registrations this year would show a greater falling off in the rate of increase than the figures reported show. The increase this year continues approximately the same average rate that has been maintained for the last seven years and shows no indication of the near approach of a condition of saturation in the supply of motor vehicles.

New Plant for Crittall Casement Window Company.
To take care of greatly increased production the Crittall Casement Window company has begun the erection of a new plant, at Hearn and Springneld streets, Detroit, Mich.

The plant is being built by Mr. A. A. Albrecht, contractor and will be ready for occupancy May 1. The plans are Crittall Casement Window Company's own. This building is designed to be the central and larger of a group of three, the other two to be built later. The main building is 300 feet long by 100 in width, and will contain the general offices as well as the steel casement factory.

Will Design High School
Architects Roland F. Sauter and E. Keith Lockard of Santa Barbara, will be associated with architect W. H. Weeks of San Francisco, in designing the new Santa Barbara High school for which bonds amounting to $450,000 were noted March 31st.

Weeks & Day Move
Messrs. Weeks and Day announce the removal of their offices from the Phelan building to California Commercial Union building, 351 Montgomery street, San Francisco, where they will continue the practice of architecture and engineering.

Wallboard Plant
Mr. William B. Thurman, president of the California Cedar Products Company, announces that his firm has just established a new wallboard plant south of Stockton. The new enterprise entails a capital of $50,000.

When writing to Advertisers please mention this magazine.
Noisy Closets not an Asset to Home Comfort

This quiet Flow Closet with supply piping concealed, is ideal for the home because it is noiseless, yet possessing abundant flushing capacity.

Haines, Jones & Cadbury Co.
Makers of Plumbing Supplies
857-859 Folsom Street, San Francisco
Philadelphia, New York, Richmond, Va., Savannah
Jacksonville, Charlotte

When writing to Advertisers please mention this magazine.
The Hermann Safe Company

Manufacturers
Fire and Burglar Proof Safes, Vault Doors, Safe Deposit Boxes, Etc.

Also Representatives
YORK SAFE AND LOCK CO.

YORK, PA.

Factory and Office
216-224 Fremont Street
San Francisco, Calif.

When writing to Advertisers please mention this magazine.
THE ARCHITECT AND ENGINEER

Present Cost of Building Materials*
With Labor Wage Scale, Bonds, Etc.

These quotations are based on reliable information furnished by the San Francisco material houses. Date of quotations, April 20, 1922.

All prices f. o. b. cars San Francisco or Oakland. For country work add freight and cartage to prices given.

**American Institute of Architects' Fees**

New work—Usual rate, 6 per cent minimum charge recommended by the Institute.
Alterations—7 to 10 per cent as a minimum.

| Bond | $1½½ amount of contract. |
| Brickwork | Common, $36.00 per 1000 laid. |
| Face, $100.00 per 1000 laid. |
| Common, f. o. b. cars, $15.50, plus cartage. |
| Face, plain o. b. cars, $50.00 per 1000, carload lots. |

**Hollow Tile Fireproofing** (Delivered to building in carload lots.)

| 12x12x3 in. | $112.00 per M |
| 12x12x4 in. | 128.50 per M |
| 12x12x6 in. | 184.50 per M |
| 12x12x8 in. | 258.50 per M |

| Hod carriers, $6.00 per day. |
| Bricklayers, $9.00 per day. |
| Lime—$2.25 per bbl.; carload, $2.1/2 per bbl. |

**Composition Floors**—30c per sq. ft.

**Concrete Work (material at San Francisco bunkers)**—

| No. 6 rock | $2.70 per yd. |
| No. 4 rock | 2½ per yd. |
| Niles pea gravel | 3.25 per yd. |
| Niles gravel | 2.50 per yd. |
| Niles top gravel | 3.00 per yd. |
| City gravel | 2.00 per yd. |
| River sand | 1.50 per yd. |
| Delivered bank sand | 1.00 per yd. |

**Sand**—

| Del Monte | $1.25 to $1.50 per ton |
| Pan Shell Beach | 2.50 to 3.00 per ton |
| Other lots, f. o. b. Lake Majella | 2.00 per ton |
| Cement (f. o. b. cars) | $3.03 per bbl. |
| Rebate for sacks, 10 each. |
| Atlas "White" | $12.50 per bbl. |
| Medusa cement | $12.50 per bbl. |
| Forms | $25.00 per M |

**Wage**—

| Concrete workers | $5.00 per day |
| Cement finishers | 8.00 per day |
| Laborers | 6.00 per day |

**Dampproofing**—

Two-coat work, 25c per yard.
Membrane waterproofing—4 layers of P. B. saturated felt, $5.25 per square.
Hot coating work, $2.00 per square.
Wage—Roofers, $7.50 per day.

**Electric Wiring**—$7.00 to $11.00 per outlet for conduit work (including switches).
Knob and tube average $3.25 to $6.00 per outlet.
Wage—Electricians, $8.00 per day.

**Elevators**—

Prices vary according to capacity, speed and type. Consult elevator companies. Average cost of installing an automatic elevator in 4-story bldg., $4,000; direct automatic, $3,500.

**Excavation**—

$1.50 per yard, if sand.
Teams, $10.00 per day.
Trucks, $21 to $30 per day.
Above figures are an average without water.
Steam shovel work in large quantities, less; hard material, such as rock, will run considerably more.

**Fire Escapes**—

Ten-foot balcony, with stairs, $100.00 per balcony.

**Glass**—(Consult with manufacturers.)

21 ounce, 20c per square foot.
Plate, $1.20 per square foot.
Art, $1.00 up per square foot.
Wire (for skylights), 41c per square foot.
Obscure glass, 28c per square foot.
Note—Add extra for setting.
Wage—Glaziers, $7.50 per day.

**Heating**—

Average, $2.00 per sq. ft. of radiation, according to conditions.
Wage—Steamfitters, $9.00 per day.

**Iron**—Cost of ornamental iron, cast iron, etc., depends on designs.
Wage—Iron workers, bridge and structural, $9.00 per day.
Architectural iron workers, $7.00 per day.

**Lumber**—

(Prices delivered to bldg. site)

Common, $32 per M (average).
Com'n O.P. (select, avrg.), $43.00 per M

**Flooring**—

1x6 No. 3—Form lumber $21.00 per M
1x4 No. 3 flooring $75.00 per M
1x4 No. 2 flooring $67.00 per M
1x4 No. 3 flooring $55.00 per M
1x6 No. 3 and better flooring $86.00 per M
1x4 and 6 No. 2 flooring $76.00 per M

**Slash grain**—

1x4 No. 2 flooring $48.00 per M
1x3 No. 3 flooring $36.00 per M

No. 1 common run to T & G $35.00 per 1000
Lath $9.00 per 1000

**Shingles**—(Add cartage to prices quoted)

Redwood, No. 1 $1.00 per bdle.
Redwood, No. 2 $.90 per bdl.
Red Cedar $1.00 per bdl.

**Hardwood Floors**—

Maple floor (laid and finished), 25c per foot.
Factory grade floors (laid and finished) 20c per foot.
Oak (quartered, finished) 40c per foot
1/4 Oak (clear) 29c per foot (plain).
3/4 Oak (select), 27c per foot (plain).
3/4 Oak, quartered, sawed, clear, 35c.
Wage—Floor layers, $9.35 per day.

**Hardwood Floors (not laid)**—

per M ft.

5/16x2" sq. edge Clear quartered oak $175.50
Select quartered oak 121.50
Clear plain oak 119.00
Select plain oak 114.00
Clear maple 134.50
Clear maple—white 178.00
13/16x2½" face Clear quartered oak 210.00
Select quartered oak 180.00
Clear plain oak 175.50
Select plain oak 114.00
Clear maple 134.50
Clear maple—white 178.00
5/8x2½" face Clear quartered oak 245.00

*Skilled labor not plentiful, and difficult to get out of town. Above prices will increase accordingly.
# Millwork

<table>
<thead>
<tr>
<th>Description</th>
<th>Rate per 1000 BTU or sq. ft.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single hung box window frames</td>
<td>$100</td>
</tr>
<tr>
<td>Double hung box window frames</td>
<td>$120</td>
</tr>
<tr>
<td>Lath, lamp, base, and cornice</td>
<td>$7.50</td>
</tr>
<tr>
<td>Doors, including trim (single panel), $10 and up each.</td>
<td>$10 and up each.</td>
</tr>
<tr>
<td>Doors, including trim (five panel), $9.00 each.</td>
<td>$9.00 each.</td>
</tr>
<tr>
<td>Screen doors, $3.50 each.</td>
<td>$3.50</td>
</tr>
</tbody>
</table>

# Marble—Patent

- **Cases**: $120 each.
- **Labor**: $10.00 per day.
- **Wage**: Housesmiths, $7.50 per day.

# Reinforcing Steel—

- **Base price for car load lots, $2.70 per 100 lbs.**, f. o. b. cars on docks.
- **Average cost to install, $24 per ton.**

# Roofing—

- **Five ply tar and gravel, $6.25 per square** for 20 squares or over.
- **Less than 30 squares, $6.75 per square.**
- **Tile, $35.00 to $50.00 per square.**
- **Redwood Shingle, $10.00 per square in place.**
- **Cedar Shingle, $10.00 per sq. in. place.**
- **Rein'd Pabco, 7 yr. roof, $7.50 per sq.**
- **Rein'd Pabco, 10 yr. roof, $8.25 per sq.**
- **Rein'd Pabco, 20 yr. roof, $14 per sq.**
- **Recoat, with Gravel, $3.00 per square.**
- **Wage—Roofers, $7.50 per day.**

# Rough Hardware—

- **Nails, per keg, $4.25 base.**
- **Deafening felt, $75.00 per ton.**
- **Building paper, P. & B.: 1 ply, $3.25 per 1000 ft. roll.**
- **2 ply, $5.00 per 1000 ft. roll.**
- **3 ply, $7.50 per 1000 ft. roll.**
- **Sash cord:**
  - Sampson spot, $1.75 per hank 100 ft. Common, $1.00 per hank 100 ft.
  - Sash weights, cast iron, $8.00 per ton.

# Sheet Metal—

- **Windows—Metal, $2.00 a square foot.**
- **Fire doors, (average), including hardware, $2.30 per sq. ft.**

# Skylights—

- **Copper,$1.25 a square foot (not glazed) Galvanized iron, 35c a square foot (not glazed).**
- **Wage—Sheet metal workers, $8.50 per day.**

# Stone—

- **Granite, average $10.00 sq. ft. in place.**
- **Sandstone, average $7.00 sq.ft. in place.**
- **Wage—Stone cutters, $8.00 per day.**
- **Stone setters, $8.50 per day.**

# Store Fronts—

- **Zouri copper bars for store fronts, corner, center and around sides, will average $1.25 per lin. ft.**
- **Zouri Underwriters' Specification sash, $1.60 per lin. foot.**

# Structural Steel—$105 per ton (erected)

- **This quotation is an average for comparatively small quantities.**
- **Light truss work higher; plain beam and column work in large quantities, less.**
- **Cost of steel for average building (erected) $100 per ton.**

# Steel Sash—

- **All makes, from S. F. stock, 26c to 34c per sq. ft.**
- **All makes, plant shipment, 28c to 34c per sq. ft.**

# Tile—White glazed, 80c per foot.

- **White floor, 80c per foot.**
- **Colored floor tile, $1.00 per foot.**
- **Promenade tile, $1.00 per sq. ft. laid.**
- **Wage—Tilesetters, $8.00 per day.**

---

Plastering—

- **Interior, on wood lath, 65c per yard.**
- **Interior, on metal lath, $1.30 per yard.**
- **Exterior, on brick or concrete, $1.30 per yard.**
- **Portland White, $1.75.**
- **Interior on brick or terra cotta, 60c to 70c per yard.**
- **Exterior, on metal lath, $1.85 to $2.25 per yard.**
- **Wood lath, $7.00 at yard per 1000.**
- **Metal studding, $1.25 to $1.50 per yard.**
- **Suspended ceiling and walls (metal furring, lathing and plastering), $2.00 per yard.**
- **Galv. metal lath, 33c and up per yard, according to gauge and weight.**
- **Lime, f. o. b. warehouse, $2.15 per bbl.**
- **Lime in less than carload lots, $2.25 per bbl.**
- **Hardwall plaster, $22.00 per ton, f. o. b. warehouse. (Rebate on sacks, 15c.)**
- **Hydrate of lime, $19.50 per ton, f. o. b. warehouse.**
- **Wage—Plasterers, $10 per day.**

Lathers, $8.00 per day.

Hod carriers, $7.00 per day.

**Plumbing—**

- **From $70.00 per fixture up, according to grade, quantity and runs.**
- **Wage—Plumbers, $9.00 per day.**

---

THE ARCHITECT AND ENGINEER
You Can Help End This Needless Waste!

Anyone having anything to do with installation of plate glass in store fronts should be appalled by the figures which show how many millions of dollars are paid out yearly because of breakage. The greater part of plate glass breakage is due to faulty setting. There would be some excuse for this needless waste if there were no remedy. But plate glass breakage may be avoided by making the following a part of all store front specifications:

Glazing Specification

All Metal Sash, Corner Bars, Division Bars and Self-Adjusting Setting Blocks Used in Store Fronts Must Be Listed by the Underwriters' Laboratories

How much longer must insurance companies—and the store owners, too—be made to pay for faulty construction? It is partly up to you to decide—the remedy rests largely in your hands.

All Zouri Key-Set Sash, Corner Division Bars and Self-Adjusting Setting Blocks have been listed by the Underwriters' Laboratories.

Ask either of the firms listed below for full particulars of Zouri Construction

COBBLEDICK-KIBBE GLASS COMPANY
Oakland and San Francisco

CALIFORNIA PAINT & GLASS CO.
Los Angeles, California

Zouri Drawn Metals Company
Factory and General Office
1632 EAST END AVENUE
CHICAGO HEIGHTS, ILLINOIS

When writing to Advertisers please mention this magazine.
Kewanee Boilers—built for 35 years—

Insure Your Building

Against Loss From

Insufficient Heat
They are conservatively rated and guaranteed for heavy overload

Interrupted Heating Service
They are All Steel, riveted throughout, no sections to break

Excessive Fuel Bills
They are 75 to 81% efficient

Tabasco All-Steel Water Heaters
Built like High Pressure Boilers
For Domestic Hot Water and for Heating Residences and Green Houses

For your service KEWANEE BRANCHES now at
San Francisco
Kewannee Boiler Company
216 Pine Street

Los Angeles
420 East 3rd Street

National Bank of San Francisco
California's Oldest National Bank
Has been a Vital Factor in the Upbuilding
Of San Francisco and the Entire West
When Laying Plans for the Future of Your Business Consult the Officers of This Institution

The First National Bank of San Francisco
Affiliated with
First Federal Trust Company
Combined Resources $60,473,521.88

Tropico Potteries, Inc.
Successors to
Pacific Minerals and Chemical Company
Glendale, Calif.
Architectural Terra Cotta
Vitrified Clay Sewer Pipe
Terra Cotta Flue Lining
Terra Cotta Chimney Pipe
Faience Tile
Drain Tile
Water Pipe
E L I M I N A T E the unsightly awnings — Preserve the exterior beauty of your buildings by

Specifying
WESTERN VENETIAN BLINDS

Some 1920 contracts for complete equipment
12-story Mattie Building
Fresno, California
9-story Pantages Building,
Los Angeles, California
7-story Marland Refining
Building,
Ponca City, Oklahoma
10-story Tradesmens Bank
Building
Oklahoma City, Okla.
5-story Railway Exchange
Muskogee, Oklahoma

When you consider the fact that WESTERN VENETIAN BLINDS take the place of both awning and window shade and will last practically as long as the building stands, you'll realize that they are the logical equipment for modern buildings.

WESTERN BLIND & SCREEN CO.
2704 LONG BEACH AVE.
LOS ANGELES
CALIFORNIA

When writing to Advertisers please mention this magazine.

CALIFORNIA GRANITE COMPANY
STONE CONTRACTORS
Phone Sutter 2646
Builders' Exchange, San Francisco
Quarries, Rocklin and Porterville
Main Office: Rocklin, Placer Co., Cal.
Telephone Main 82

LAWTON & VEZEY
CONTRACTORS AND BUILDERS
332 CALL BUILDING
SAN FRANCISCO
306 PLAZA BUILDING
OAKLAND

CHAS. STOCKHOLM & SONS
GENERAL CONTRACTORS
849 MONADNOCK BUILDING
Phone DOUGLAS 4657
SAN FRANCISCO

Hot Water Electrically
ALL YOU WANT THERM ELECT WATER HEATER
ALL THE TIME for APARTMENT HOUSES
ELECTRIC SALES SERVICE COMPANY RESIDENCES, ETC.
2332 Sixth Street, BERKELEY
Phone Berkeley 3670

JOHN M. BARTLETT
GENERAL CONTRACTOR
Office
357 - 12th ST. OAKLAND

LARSEN-SIEGRIST CO., Inc.
BUILDING CONSTRUCTION
807 Claus Spreckels Building
SAN FRANCISCO

Shop and Compare — that's the only true test of values
Furnishings for the home of distinctive style
are featured in this shop at prices that will bear
the strictest comparison.
Furniture, Draperies, Floor Coverings, Interior Decorations

RUEGG BROS.
CONTRACTORS AND BUILDERS
Phone Douglas 1599
719 Pacific Building, SAN FRANCISCO

When writing to Advertisers please mention this magazine.
Cabot's

Old Virginia White

A Soft, Brilliant White for Shingles, Siding and Similar Woodwork. As Bright and Clean as New Whitewash, and as lasting as Paint.

Architects and others have tried for years to get a paint that would give the same beautiful, brilliant white as new whitewash, and would also be durable and clean and not rub off like whitewash. But paint was always "painty"—hard, cold and heavy. Old Virginia White is a shingle-stain compound that has solved the problem. It is as clean, cool and brilliant as fresh whitewash, and as lasting as paint; but it is not messy like whitewash, nor painty like paint, although it costs less and goes farther than paint.

Send for Sample Shingle and Circular showing other fine houses finished with Old Virginia White


Cabot's Creosote Stains, Stucco and Brick Stains, "Quilt," Mortar Colors, Dampproofing, Waterproofing, Conservo Wood Preservative, etc.

Pacific Materials Co., San Francisco
The Waterhouse-Wilcox Co., Los Angeles
Timms, Cress & Co., Portland
Theo. F. Snyder, San Diego, Cal.

OCEAN SHORE IRON WORKS

Manufacturers of
BOILERS, STEEL TANKS, STEEL PLATE SPECIALTIES

Dealers in
BOILERS, TANKS, PUMPS, ENGINES
GENERAL MACHINERY, ETC.

Office and Works: Phones Market 162 and 163
550-558 EIGHTH STREET
SAN FRANCISCO, CAL.

OPEN HEARTH

REINFORCING STEEL BARS

Square Deformed—Immediate Shipment—Cut to required lengths

PACIFIC COAST STEEL COMPANY
Sales Office, Rialto Building  SAN FRANCISCO  Phone Sutter 1564

When writing to Advertisers please mention this magazine.
The Door that Suits Your Building

The Kinnear Rolling Door is built individually to meet the requirements of the building—it is the modern industrial door—for all types of buildings. It gives protection against fire and burglary. For endurance, perfect performance and the utmost economy—leading architects use Kinnear Steel Rolling Doors. Our Engineering Department at your service. Ask for illustrated catalog.

The Kinnear Manufacturing Co.
661-671 Field Ave.,
Columbus, Ohio
San Francisco, 525 Market St.

Bungalows

The Book on Request
Marshall & Stearns Co.
1152 Phelan Bldg.
San Francisco
A Lesson in Economy

After the failure of the original wheel hangers

Reliance-Grant Ball-Bearing Elevator Door Hangers

were placed in the following buildings:

Wells Fargo National Bank
First Natl. Bank Bldg.
Wiltshire Hotel
I. Magnin Bros.
Gatten & Mattern Bldg.
Kohi Bldg.
Realty Syndicate Bldg.
Thayer Bldg.
French Bank Bldg.
Plaza Hotel
Livingston Bros.
Federal Hotel
Western Sugar Co.
Hotel Land
Rowell Bldg.
Physicians' Bldg.
New York Block

Oakland
San Francisco
San Francisco
San Francisco
San Francisco
San Francisco
San Francisco
Oakland
San Francisco
San Francisco
San Francisco
San Francisco
San Francisco
San Francisco
San Francisco

In all of these cases the saving of a few dollars in the cost of the original installation by the use of an inferior product proved in the end to have been a loss.

Manufactured by

Reliance-Grant Elevator Equipment Corporation

Park Avenue and 40th Street, New York

PACIFIC COAST AGENTS

Waterhouse-Wilcox Co. - - San Francisco and Los Angeles, Calif.
Columbia Wire & Iron Works - - - - Portland, Ore.
D. E. Fryer & Company, Seattle, Spokane, Tacoma, Wash., & Great Falls, Mont.

Look for this Trademark

And if it's there don't worry any more about your Valves and Fittings

Specify and insist upon having

The Kelly & Jones Co.

Valves and Fittings

Byers Genuine

Wrought Iron Pipe

Republic Steel Pipe

Complete Line of Plumbing Supplies
Large Stocks for Prompt Delivery
Catalogue on request

California Steam & Plumbing Supply Co.

671-679 Fifth Street, Corner Bluxome
SAN FRANCISCO CALIFORNIA

When writing to Advertisers please mention this magazine.
THE TORMEY CO.

General Painters
Phone Franklin 5 - 5 - 9 - 8
1042 Larkin St., San Francisco, Cal.

Alvaline, Cementoline and other Jones-Duncan Products
MAGNER BROTHERS PAINT MAKERS
Telephone: Market 113
414-424 Ninth St. San Francisco

HEATING-PLUMBING

COMPLETE PLUMBING AND HEATING SYSTEMS INSTALLED IN ALL CLASSES OF BUILDINGS—ALSO POWER PLANTS
GILLEY-SCHMID CO., Inc.
198 Otis St., San Francisco
Tel. MARKET 965

"BLAZING" THE TRAIL
We've been doing it for many years—giving the Sportsman Better Value for Quality than he ever before received. "Value at a Fair Price" in everything for the Sportsman.

The Ellery Arms Company
SEND FOR CATALOG The Sign of Quality

Phone Douglas 3224

Hunter & Hudson ENGINEERS
Designers of Heating, Ventilating and Wiring Systems, Mechanical and Electrical Equipment of Buildings
703 Rialto Bldg., San Francisco, Cal.

BEAVER BLACKBOARD
BEAVER GREENBOARD
SCHOOL FURNITURE AND SUPPLIES—OFFICE, BANK AND COURTHOUSE FURNITURE—THEATRE AND AUDITORIUM SEATING
Rucker-Fuller Desk Co.
677 Mission St., San Francisco, Calif.
134 Higgins Bldg., Los Angeles, Calif.
132 - 14th Street - Oakland, Calif.

Pittsburg

It Insures Instant Hot Water Service
PITTSBURG WATER HEATER COMPANY
473 Sutter S., San Francisco
Phone Sutter 3025

RUSSWIN
BUILDERS' HARDWARE
JOOST BROS., Inc. SAN FRANCISCO AGENTS
We Carry Complete Stock:
NO BRANCH STORE
Mazda Lamps Electric Goods
This TRADE MARK means much to the conscientious Architect and Builder

It is a guarantee that the client will be satisfied.

HOLBROOK, MERRILL & STETSON

HIGH-GRADE PLUMBING FIXTURES

64 Sutter Street
San Francisco

Victory-Forster Closet Connection

Each Fitting Consists of
Brass Floor Flange—Iron Bend or Stub
with Testing Cap in Flange and Bolts

Victory Manufacturing Co.
San Francisco, Calif.
Sold by All Plumbing Jobbers
I. R. KISSEL
Decorator, Painter and Paperhanger
1747 SACRAMENTO ST., Bet. Polk St. and Van Ness Ave., SAN FRANCISCO

ROBERT TROST
General Building Contractor
We Specialize in High Grade Work and Employ Skilled Labor in every Branch of the Building Industry.
26th and Howard Streets
SAN FRANCISCO

P. A. PALMER
Contracting Engineer
782-796 Monadnock Building
SAN FRANCISCO, CAL.

LOUIS FONTANELLA, Phone Mission 8923
MARK TEZA, Phone Valencia 1623

FONTANELLA & TEZA
General Contractors
Telephone West 1285
1682 Eddy Street, San Francisco

MONSON BROS.
Building Construction
Yard
Mariposa and Bryant Streets
Phone Market 2963
251 Kearny Street, San Francisco
Telephone Douglas 6619

UNIT CONSTRUCTION COMPANY
(INCORPORATED)
ENGINEERING AND CONSTRUCTION
Telephone Kearny 28
429-36 Phelan Building, SAN FRANCISCO

J. D. HANNAH
Contractor and Builder
Office: 142 Sansome Street
San Francisco, Cal.
BUILDERS EXCHANGE, 180 JESSIE STREET
Telephone Douglas 3895

When writing to Advertisers please mention this magazine.
Advise your clients to purchase their rugs and carpets from us.

They will thank you for the advice.

Our rugs and carpets are of the very best quality, and our prices are guaranteed to be the lowest in San Francisco.

CLINTON
WELDED WIRE FABRIC and LATH
L. A. NORRIS CO.
140 Townsend Street
Phone Kearny 5375 San Francisco

EDW. J. MARGETT
Wholesale Jobber
61 Ellis Street
Phone Douglas 2253
Opposite Century Theater

ROBERTS MFG. CO.
Lighting Fixtures
Electric Appliances
Incandescent Lamps

WILLYS FARM LIGHTING AND POWER PLANTS

Thomas Day Co.
Lighting Fixtures
SAN FRANCISCO
725 MISSION STREET
Douglas 1573
663 Mission Street San Francisco

LOS ANGELES, 209-10 BROCKMAN Bldg.

When writing to Advertisers please mention this magazine.
I. M. SOMMER & CO.
ENGINEERS AND
GENERAL CONTRACTORS
CONCRETE
CONSTRUCTION
Phone Kearny 4582 401 BALBOA BLDG., SAN FRANCISCO

K. E. PARKER COMPANY, Inc.
GENERAL CONTRACTORS
Phone Sutter 5661 Room 515 Clunie Building, SAN FRANCISCO

R. W. LITTLEFIELD
Building Construction
357 12th Street, Room 9, Oakland, Cal. Phone Lakeside 6750

H. H. HILP, Jr. J. FRANK BARRETT
BARRETT & HILP
CONCRETE CONSTRUCTION BUILDERS GENERAL CONTRACTORS
918 HARRISON STREET, near 5th, SAN FRANCISCO Telephone DOUGLAS 700

CAEN STONE A. KNOWLES
A refined, elegant, CONTRACTOR AND PLASTERER interior finish.
442 Call-Post Building San Francisco

STEELFORMS Signify ECONOMY, RAPIDITY, and EFFICIENCY
STEELFORM CONTRACTING COMPANY
STEELFORMS FOR CONCRETE BUILDINGS
C. B. Hopkins, C. E., Manager 681 Market Street, San Francisco
CONCRETE JOIST FLOOR CONSTRUCTION

HILL, HUBBELL & CO.
Manufacturers and Roofing Contractors
115 Davis Street San Francisco
Los Angeles Seattle Portland New York

M. E. VUKICEVICH SPENCER B. BAGGE
VUKICEVICH & BAGGE GENERAL CONTRACTORS
Phone Sutter 6700 Office, Builders Exchange, 180 Jessie St., San Francisco

When writing to Advertisers please mention this magazine.
<table>
<thead>
<tr>
<th>Company Name</th>
<th>Address</th>
<th>Services</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard Fence Co.</td>
<td>316 12th Street, Oakland</td>
<td>Wire and iron works, wire grill work, wire screen, flexible wire conveyor belt, wire specialties</td>
</tr>
<tr>
<td>Steel Bars</td>
<td>267 S. 12th Street, Oakland</td>
<td>Designers—builders, home and estate fencing, aviary and tennis court fencing</td>
</tr>
<tr>
<td>Badt-Falk &amp; Co.</td>
<td>320 North Los Angeles Street, Los Angeles, Cal.</td>
<td>Wire works, flexible wire conduit, wire specialties</td>
</tr>
<tr>
<td>Atherley Bros.</td>
<td>67188</td>
<td>Work that satisfies</td>
</tr>
<tr>
<td>Marten &amp; Frederick</td>
<td>320 North Los Angeles Street, Los Angeles, Cal.</td>
<td>Designers, makers, and contractors of fine furniture, draperies, and complete interiors</td>
</tr>
<tr>
<td>Griffin Sheet Metal Works</td>
<td>1720 H Street, Fresno, California</td>
<td>Heating and ventilating contractors, steam tables and kitchen equipment</td>
</tr>
<tr>
<td>Herbert Beckwith</td>
<td>323 Newton Avenue, Oakland</td>
<td>Building construction</td>
</tr>
<tr>
<td>D. Zelinsky &amp; Sons</td>
<td>420 Turk Street, San Francisco</td>
<td>Painters and decorators</td>
</tr>
<tr>
<td>Charles T. Phillips</td>
<td>Consulting Engineer</td>
<td>Pacific building, heating, ventilation, wiring, illumination</td>
</tr>
</tbody>
</table>
Geo. T. Fletcher       Geo. P. Schmitt        E. L. Fletcher
PACIFIC HEATING COMPANY
Heating, Ventilating and Sheet Metal Work
Coal, Wood, Oil and Gas Heaters to Meet all Requirements
We Repair All Makes of Heating Appliances
WORK GUARANTEED   Oakland 388  Corner Second and Grove Streets, OAKLAND CALIF.

Atlas Heating and Ventilating Co., Inc.
ENGINEERS and CONTRACTORS
STEAM AND HOT WATER HEATING, FANS, BLOWERS
FURNACES, POWER PLANTS—SHEET METAL WORK
Phone Douglas 378        Fourth and Freelon Sts., Bet. Bryant & Brannan, SAN FRANCISCO

CLARENCE DRUCKER       HERMAN LAWSON
LAWSON & DRUCKER
PLUMBING—HEATING—CONTRACTORS
TELEPHONE MARKET 275     450 HAYES STREET
SAN FRANCISCO, CAL.

HEATING VENTILATION
FLOOR AND WALL TILING
PLUMBING SHEET METAL WORK
SCOTT CO., Inc.
243 MINNA STREET        SAN FRANCISCO

ALEX COLEMAN
CONTRACTING PLUMBER
706 ELLIS STREET, SAN FRANCISCO        Phone FRANKLIN 1006

WM. F. WILSON COMPANY
MODERN SANITARY APPLIANCES
Special Systems of Plumbing for Residences, Hotels, Schools, Colleges, Office Buildings, Etc.
Phone Sutter 357        328-330 Mason Street, San Francisco

W. H. PICARD
PLUMBING AND HEATING
Picard & Edwards
Heating, Ventilating and Power Plants
5626 College Avenue
5662 Keith Avenue
Piedmont 7522        Oakland, Calif.

THOS. BRODIE, Plumber
TINNING, ROOFING and CHIMNEY TOPS
Automobile Service Carrying All Repairs
2119 FILLMORE STREET (near California)        SAN FRANCISCO

When writing to Advertisers please mention this magazine.
MOUNT DIABLO CEMENT
COWELL SANTA CRUZ LIME
ALL KINDS OF
BUILDING MATERIALS
HENRY COWELL LIME AND CEMENT CO.
Phone Kearny 2095  No. 2 MARKET STREET, SAN FRANCISCO

RALPH E. DODGE
CIVIL ENGINEER.
Bridges and Special Structures of Reinforced Concrete and Steel
Structural Designs for Buildings
Reports on Highway Projects.
Supervision of Construction.
Telephone Keary 1783  251 Kearny Street
San Francisco, Calif.

Cast Iron Stairs and Store Fronts
Bank and Office Railings, Elevator
Enclosures and Fire Escapes
C. J. HILLARD & CO., Inc.
Nineteenth and Minnesota Streets
Telephone Mission 1763  SAN FRANCISCO, CAL.

George S. MacGruer  Robert M. Simpson  Members of Builders Exchange

MacGruer & Simpson
CONTRACTING PLASTERERS
PLAIN AND ORNAMENTAL
Cement, Stucco and Artificial Stone
Phone Garfield 512  266 Tehama Street, San Francisco

When writing to Advertisers please mention this magazine.
PASSENGER AND FREIGHT ELEVATORS
Made in San Francisco
Factory and Warehouse
166-180 SEVENTH STREET Phones: Market 1534 and 1535
SPENCER ELEVATOR COMPANY

JAS. I. KRUEGER
 Representing
 Illinois Engineering Company, Chicago
 Eureka Brass Works, Cincinnati
 Manufacturers of
 Vacuum and Vapor Steam Heating Materials, Power Plant Equipment
 Standard Radiator and Gate Valves, Pumps for Vacuum Systems of Heating
 557-559 Pacific Building, San Francisco Telephone Sutter 7857

RAYMOND GRANITE COMPANY, Inc.
 Owning and operating at Knowles, Madera County, the largest Quarry in the world
 CONTRACTORS FOR STONE WORK
 Designers and Manufacturers of Exclusive Monuments and Mausoleums
 Main Office and Yard: No. 1 and 3 Potrero Avenue, San Francisco, California
 Also at 1350 Palmetto Street, Los Angeles

CYCLOPS IRON WORKS
ICE MAKING and REFRIGERATING MACHINERY, TRAVELING CRANES
Office and Works: SAN FRANCISCO, CAL.
837-847 FOLSOM ST. Telephone: SUTTER 3030

PNEUMATIC WATER PRESSURE SYSTEMS
ALL SIZES AND TYPES—For Private Homes and Public Buildings
CALIFORNIA HYDRAULIC ENGINEERING AND SUPPLY CO.
80 Fremont Street San Francisco
Arden Plaster

Now available in any quantity desired for immediate delivery

For further information call on your dealer

Manufactured by

United States Gypsum Co.

The General Fireproofing Company

Manufacturers of
Herringbone Rigid Metal Lath, Corner Bead, Self Sentering, Peds, Diamond Mesh Lath, and waterproofing materials for Concrete

Write for booklet describing, and answering every possible question you may ask concerning the use of fireproof and waterproof materials

N o. 2 0 B e a l e S t re e t
San Francisco
Telephone Douglas 6616 Piedmont 4935 W

FIRE PROOF GARAGES

Steel Frames
may be made in accordance with architect’s plans.

Also Portable All Steel Buildings
Manufactured by
B E N S O N & B E N S O N
San Jose, Calif.

Complete Protection with Service at Cost —

is furnished by the oldest, largest, and strongest mutual casualty company in America.

Workmen's Compensation Insurance
Employers' Liability Insurance
Automobile Liability Insurance
Also Other Forms of Liability Insurance

Send for your copy of the booklet “30-30,” which tells the whole story

San Francisco Office, 816-817 Balboa Bldg.

GEORGE W. LINCK, District Manager

AMERICAN MUTUAL
Liability Insurance Company

When writing to Advertisers please mention this magazine.
POSITIVE ELECTRIC INTERLOCK
(BAR LOCK TYPE)
Prevents Elevator Accidents Occurring at the Entrance Door
Approved by National Underwriters Laboratories—Meets requirements of Elevator Safety Orders of Industrial Accident Commission, State of California
ELEVATOR SUPPLIES COMPANY, Inc.
186 FIFTH STREET
SAN FRANCISCO

Capital $2,000,000
CALIFORNIA DEPARTMENT
Surplus $2,250,000
THE FIDELITY AND CASUALTY COMPANY OF NEW YORK
Prompt Service for
BONDS AND CASUALTY INSURANCE
BALFOUR BUILDING
SAN FRANCISCO, CAL.

National Surety Company of New York
The World's Largest Surety Company
Assets over $20,000,000
Pacific Coast Department: 105 MONTGOMERY ST., SAN FRANCISCO, CAL.
Frank L. Gilbert, Vice-President
Phone, Sutter 2636

PACIFIC DEPARTMENT
GLOBE INDEMNITY COMPANY
Bonds and Casualty Insurance for Contractors
FRANK M. HALL, formerly Robertson & Hall, Mgr.
444 California Street
Phone Sutter 2280
SAN FRANCISCO

PHONE DOUGLAS 2370
R. McLERAN & CO.
GENERAL CONTRACTORS
HEARST BUILDING
SAN FRANCISCO, CAL.

ALFRED H. VOGT
GENERAL CONTRACTOR
185 Stevenson Street, San Francisco

J. F. WAYNE
Phone Fillmore 1856
Wayne & Williams
PAINTERS and DECORATORS
PHONE MARKET 3427
1621 EDDY STREET
SAN FRANCISCO

R. C. WILLIAMS
Phone Market 3427

POSITION WANTED in Architect's or Engineer's Office — structural steel design and detail — architectural drafting. O. T. Illerich, 814 Paloma Avenue, Oakland. Phone Lakeside 4006.
The Elevator Floor

whether in Office Building, Hotel or Department Store, is subjected to a great deal of wear and tear.

SPECIFY—
INTERLOCKING RUBBER TILING

and you've provided your client's building with a Durable, Economical, Practical material that is sure to give satisfaction.

Twenty tons installed in the Standard Oil Building, San Francisco.

Stock on hand for immediate delivery.

NEW YORK BELTING AND PACKING CO.
NEW YORK
San Francisco Branch 519 MISSION ST. Phone Douglas 1837

Small booklet of designs mailed on request

Specify BOWSER

THE latest Bowser Piston-Type Measuring Pump (illustrated) is either hand or air-driven and exemplifies the high standard of service set by Bowser Equipment.

The motive power being air, the usual fire hazard in handling gasoline by power is eliminated.

Bowser Equipment accurately, economically and safely meets all requirements for gasoline and oil storage and service.

Whether it is in a garage, railroad, factory or dry cleaning plant, you are best serving your clients when you specify Bowser Equipment.

Write for Illustrated Booklet A-03

S.F. BOWSER & COMPANY, Inc.

1362 CREIGHTON AVE., FORT WAYNE, INDIANA
Sales Offices (with Service Departments) throughout the United States and in Principal cities of the World.

612 Howard Street
San Francisco, Calif.

1225 So. Olive Street,
Los Angeles, Calif.

LONDON PARIS HAVANA SYDNEY

When writing to Advertisers please mention this magazine.
MORTENSON CONSTRUCTION CO.
CONTRACTORS FOR STRUCTURAL STEEL AND IRON
H. MORTENSON, President
Office and Shops: Corner 19th and Indiana Streets
Phone: Mission 5033  SAN FRANCISCO, CAL.

JUDSON MANUFACTURING COMPANY
Main Office: 817-821 FOLSOM STREET
Works: OAKLAND—EMERYVILLE
Structural Steel and Iron Work
CALIFORNIA
C. C. SAUTER, Chief Engineer

Federal Ornamental Iron & Bronze Co.
Bank Counter Screens and Grille Work Our Specialty
Most Modern Equipment Throughout
Recent Contracts: BANK OF ITALY, FIRST NATIONAL BANK
16th Street and San Bruno Avenue, San Francisco
Phone Market 1011

S. S. HERRICK CO.
STRUCTURAL STEEL
BUILDINGS :: BRIDGES :: TOWERS
Office and Works
Foot of Adeline Street
Oakland, Calif.
Telephone Lakeside 1460

CENTRAL IRON WORKS, Inc.
STRUCTURAL STEEL
Office 2050 BRYANT STREET
SAN FRANCISCO, CAL.

Golden Gate Iron Works
STRUCTURAL STEEL AND ORNAMENTAL IRON CONTRACTORS
Howard and 11th Streets
San Francisco

SCHRADER IRON WORKS, Inc.
STRUCTURAL STEEL CONTRACTORS
Fire Escapes, Waterproof Trap Doors, Ornamental Iron Work
1247-1249 HARRISON STREET
San Francisco, Cal.
Telephone Market 337

When writing to Advertisers please mention this magazine.
BEAUTIFUL GARDEN EFFECTS for the City and Suburban Home

MacRORIE-McLAREN CO.
Landscape Engineers
and General Nurserymen

Office
141 Powell Street
San Francisco
Nurseries at
Beresford,
San Mateo Co.

SCHOOL
FURNITURE
AUDITORIUM
SEATING

C. F. WEBER & CO.
985 Market Street
SAN FRANCISCO
222-224 S. Los Angeles St.
LOS ANGELES
100 W. Commercial Row
RENO, NEVADA
524 W. Washington Street
PHOENIX, ARIZONA

THE HYLOPLATE BLACKBOARD

TRANSMISSION EQUIPMENT
For Mill or Factory

Cranes - Sheeting - Gauges -
Hangers - Bearings - Take Ups -
Sprockets - Clutches - Chain Belts -
Floor Stands - Belt Tighteners - Rope Sheaves

Meese & Gottfried Company

Make Your CRANE Visit
Part of the Plan

The complete resources of CRANE Branches
and Exhibit Rooms the country over are at
your disposal when you need equipment for any
phase of plumbing, sanitation, heating or kin-
dred service.

We are manufacturers of about 26,000 articles
including valves, pipe fittings and steam special-
ties made of brass, iron, ferrosteel, cast
steel and forged steel, in all sizes, for all pres-
sures and all purposes, and are distribu-
tors through the trade, of pipe, heating and
plumbing materials.

CRANE CO.
Plumbing Supplies
Second and Brannan Sts. 345 Ninth Street
San Francisco Oakland

When writing to Advertisers please mention this magazine.
Western Safety Switches
Manufactured by
Western Safety Man'fg Co., Inc.
Enclosed Externally Operated Safety Switches, Knife Switches, Metal Switch and Cut Out Boxes, Safety Switch Boards
Office, 247 Minna Street SAN FRANCISCO
Telephone, Sutter 3008

Telephone DOUGLAS 2046 CHARLES FELIX BUTTE
BUTTE ELECTRICAL EQUIPMENT COMPANY
Trade Mark BEECO Registered
ELECTRICAL CONTRACTORS AND ENGINEERS
530 FOLSOM STREET SAN FRANCISCO

L. SIEBERT J. GENSLER
Drendell Electrical & Mfg. Co.
Incorporated
SWITCHBOARDS, PANEL BOARDS, KNIFE SWITCHES, CABINETS, THEATRE INSTALLATIONS, PROTECTIVE POWER PLANTS
1345-1353 Howard St., San Francisco Telephone Market 1753

MEYERS SAFETY SWITCH CO.
MANUFACTURERS OF
Enclosed Externally Operated "Safety" Switches and Electrical Sheet Metal Products
575 HOWARD ST., SAN FRANCISCO Telephone Sutter 4213

When writing to Advertisers please mention this magazine.
**BUTTE ELECTRIC & MFG. CO.**
**DOUGLAS 145**
**ELECTRIC BANK PROTECTION SYSTEMS**
**WIRING FOR BUILDINGS**
534 FOLSOM ST., SAN FRANCISCO

**H. S. TITTLE**
**CONTRACTING ELECTRICAL ENGINEER**
766 FOLSOM ST., SAN FRANCISCO

**To Be “Low Bidder” Not Always Our Aim**
**“QUALITY AND SERVICE ALWAYS”**
Our nation-wide organization and large experience in this field assure you always of fair estimates and absolute satisfaction.

**F. E. NEWBERY ELECTRIC CO.**
Office and Show Rooms 339 Sutter St., San Francisco
Phone Sutter 521

San Francisco, Cal.
Oakland, Cal.
Los Angeles, Cal.

**NE PAGE, McKENNY CO.**
**Electrical Engineers and Contractors**
Phone Sutter 2369
589 Howard St., San Francisco, Cal.

**GLOBE ELECTRIC WORKS**
**Estimates Furnished on Everything Electrical**
**ELECTRIC SUPPLIES**
1959 Mission Street, bet. 15th and 16th
SAN FRANCISCO

**Browne-Langlais Electrical Construction Co.**
**Agents for**
**ROBBINS and MYERS MOTORS, PACKARD MAZDA LAMPS**
313 FIFTH STREET, SAN FRANCISCO
Telephone Douglas 976

**G. WALTER SPENCER, Manager**
**SPENCER ELECTRIC CO.**
**CONTRACTING AND ENGINEERING**
355 TWELFTH STREET
OAKLAND, CALIF.

**Motors** **Lighting Fixtures** **Construction**
Bought, Sold, Rented, Repaired **Manufactured** **Maintenance Supplies**

**SPOTT ELECTRICAL CO.**
16TH and CLAY STREETS
OAKLAND, CALIFORNIA
MOTT PLUMBING FIXTURES

Architects and their clients are invited to visit our Showrooms, 553-555 Mission Street, San Francisco; D. H. Gulick, Sales Agent. Los Angeles Office, 603 Central Building; J. R. Mayhew, Sales Agent.

MOTT COMPANY OF CALIFORNIA

MUELLER..... BRASS GOODS

Recognized as the Standard of excellence in plumbing. It pays to use them, and other Mueller Brass Goods. The first cost is practically their last cost.

635 MISSION STREET, SAN FRANCISCO, CAL.

SPECIFY
STORM KING AND AMERICAN WARM AIR FURNACES FURNACE FITTINGS AND REPAIRS

Montague Range and Furnace Company
327-329 JESSIE STREET Phone Garfield 1422 826-830 MISSION STREET
SAN FRANCISCO, CALIF.

Modern Heating Plants...


JAMES A. NELSON Heating and Ventilating Contractor
Phone, GARFIELD 1959 517-519 SIXTH ST., SAN FRANCISCO

When writing to Advertisers please mention this magazine.
ACORN BRAND OAK FLOORING
for discriminating Architects and Builders, and characteristically
a Tennessee product in every way, from the excellence of the
wood itself to the superior millwork and careful grading . . .

Strable Hardwood Co.  HARDWOOD
LUMBER
PHONE OAKLAND 245
511-545 FIRST STREET  OAKLAND, CALIFORNIA

NO GERMS HERE
HAWS IMPROVED SANITARY DRINKING
FAUCET eliminates all possibility of con-
tracting disease from dirty bulbs or unsanitary
bowls. Provided with an overhead cowl, the
drinker’s lips never touch the source of supply.
A slanting stream throws the water from right
to left and away from the bubbler, instead of
straight up to fall back over the fountain head.
Recommended for Schools and Public Playgrounds.
Manufactured by
Haws Sanitary Drinking Faucet Co., Inc.
1808 Harmon Street, Berkeley,
Phone Piedmont 3742

QUALITY PRODUCTS
Proven by the Test of Time
MORAN’S PRESERVATIVE
PAINTS
Genuine Preservative Paints for
Every Use. Will positively pre-
serrve iron, steel, wood, concrete,
roofs, piles, poles, railroad ties and
all wood or metal surfaces above or
below earth or water.
A. W. CADMAN MFG. CO.
Cadman Valves
The Plug Valve guaranteed not to
bind, stick, or leak. Complete line
of Power Equipment.

J. P. BELL & COMPANY
Associated Company
Commercial Export and Import Co., Inc.
Sole Representatives
Balboa Building  SAN FRANCISCO  Tel. Sutter 6833
Branches in Los Angeles, Salt Lake City
Honolulu, Australia and New Zealand

“MPCO”
STONE SHINGLES
LIGHT WEIGHT  FIREPROOF
EVERLASTING
McCLENAHAN PRODUCTS
COMPANY INC.
112 Kearny Street  San Francisco

When writing to Advertisers please mention this magazine.
MILLER FOLDING IRONING BOARD
ELIMINATES WALL CABINET—IS INSTALLED IN KITCHEN CUPBOARD
NO PLASTER GROUNDS SAVES WALL SPACE AND LABOR
CASING OR PAINTING TIME AND MATERIAL
Exhibited by LANNOM BROS. MFG. CO
and sold by 362 Magnolia St., Oakland, Calif.
Send for W. N. MILLER Catalogue to 844 Thirteenth St., Oakland

MILLWORK Manufactured and Delivered Anywhere
Plans or Lists sent us for Estimates will have Careful and Immediate Attention
Jno. Dudfield, Pres.
and Manager
DUDFIELD LUMBER COMPANY
Joseph A. Jury, Sec'y & Mill Supt.
MAIN OFFICE, YARD AND PLANING MILL—PALO ALTO, CALIFORNIA

SCHOOL AND THEATRE
STAGES AND EQUIPMENT
EDWIN H. FLAGG
SCENIC COMPANY, Inc.
100 Pantages Bldg., San Francisco, Cal.
Studios, 1873 Mission Street, San Francisco
1638 Long Beach Ave., Los Angeles, Cal.

A. C. SCHINDLER, President
The Fink & Schindler Co.
Manufacturers of INTERIOR WOODWORK AND FIXTURES
BANK, OFFICE AND STORE FITTINGS
SPECIAL FURNITURE
218-228 THIRTEENTH STREET
Bet. Mission and Howard Sts.
SAN FRANCISCO, CAL.
Telephone: Market 474

O. BAMANN, President
HOME MANUFACTURING CO.
BANK, STORE AND OFFICE FITTINGS
FURNITURE AND HARDWOOD INTERIORS
CABINET WORK OF EVERY DESCRIPTION
543 and 545 BRANNAN ST. Phone Kearny 1514
San Francisco, Cal.

Mullen Manufacturing Co.
BANK, STORE AND OFFICE FIXTURES—CABINET WORK OF
GUARANTEED QUALITY—CHURCH SEATING
Office and Factory:
Telephone Market 8692 64 Rausch St., Bet. 7th and 8th Sts. San Francisco

JAMES L. McLAUGHLIN
GENERAL CONTRACTOR
Phones Douglas 6645—6646 251 KEARNY STREET, SAN FRANCISCO

Dolan Wrecking & Construction Co.
(D. J. DOLAN)
Lumber, Lath, Nails, Shingles, Doors, Windows
and Plumbing Supplies, New and Second Hand
Phone Market 4264 Office and Yard, 1607-1639 MARKET ST., SAN FRANCISCO

When writing to Advertisers please mention this magazine.
United States Steel Products Co.

Rialto Bldg., San Francisco


MANUFACTURERS OF
Structural Steel for Every Purpose—Bridges, Railway and Highway—"Triangle Mesh" Wire Concrete Reinforcement—Plain and Twisted Reinforcing Bars—Plates, Shapes and Sheets of Every Description—Rails, Splice Bars, Bolts, Nuts, etc. — Wrought Pipe, Trolley Poles — Frogs, Switches and Crossings for Steam Railway and Street Railway — "Shelby" Seamless Boiler Tubes and Mechanical Tubing—"Americore" and "Globe" Rubber Covered Wire and Cables—"Reliance" Weatherproof Copper and Iron Line Wire — "American" Wire Rope, Rail Bonds, Springs, Woven Wire Fencing and Poultry Netting—Tramways, etc.

United States Steel Products Co.
OFFICES AND WAREHOUSES AT
San Francisco Los Angeles Portland Seattle

When writing to Advertisers please mention this magazine.
CRUSHED ROCK
GRAVEL
SAND
COAST ROCK AND GRAVEL CO.
500 Call Building SAN FRANCISCO Phone Sutter 3990
Plants at Niles, Fair Oaks, Oroville, Elot, Piedra and Marysville

OTIS ELEVATORS

HE Architect or Engineer can specify "Otis Elevators," assured that the responsibility of the Otis Elevator Company extends beyond satisfactory installation. Buildings equipped with Otis Elevators enjoy the advantage of the prompt service and careful inspection rendered by any of our hundred offices. Such service means your clients' gratitude.

Otis Elevator Company
OFFICES IN ALL PRINCIPAL CITIES OF THE WORLD
2300 Stockton Street SAN FRANCISCO, CAL.

When writing to Advertisers please mention this magazine.
This trademark guarantees the highest quality plumbing fixtures
PABCO
Paints Varnishes & Enamels

Now the PABCO quality mark has gone a step farther: PABCO PAINTS, VARNISHES AND ENAMELS are being made for general and home-owners' use and are being sold by dealers.

WHEREVER you desire to specify a paint or varnish—inside or outside—you will find just what you are seeking in the PABCO Line.

The PABCO trade-mark has for many years been the symbol of highest quality on an extensive line of paints, varnishes, enamels and stains which have been sold to large manufacturing plants, shipyards, railroads, public service corporations, mines, packing houses, canneries, bakeries, food products plants, etc.

Could any line of paints and varnishes have a stronger recommendation?

Send for one of our Paint Advisors

THE PARAFFINE COMPANIES, INC.
Seattle, Portland, San Francisco, Los Angeles

When writing to Advertisers please mention this magazine.
McCabe Hangers

For

Accordion Doors
Folding Partitions

Accordion and Folding Partitions have proven their advantage in the subdivision of large rooms. Arrange the partitions as you may desire and we can furnish the hangers to operate them.

Our Accordion type is applied where a half door is used at the jamb—the doors are centrally hung.

Our No. 402 and 405 folding types are applied where all doors are the same width—hangers are applied at the edge of the doors.

Write for our set of details No. 4C

The McCabe Hanger Mfg. Company

W. H. Steel, Agent
Los Angeles, Calif.

425 W. 25th St.
New York City

General Machinery & Supply Co.
OFFICES and STORE: 39-51 Stevenson Street
TELEPHONE—Private Exchange—Sutter 6750

—AGENTS FOR—
EVERLASTING BLOW-OFF VALVES

WM. Powell Co's
White Star Valves—Model Star Valves
Union Composite Disc Valves
and Pilot Gate Valves
Yale & Towne:—Chain Hoists
Fisher and Swartwout Steam Specialties

ENGINEERS', MACHINISTS' and STEAM FITTERS' SUPPLIES
Pipe, Pipe-Fittings, Valves, Belting, Packing and Hose
Transmission and Conveying Machinery

SEND US YOUR INQUIRIES

When writing to Advertisers please mention this magazine.
Stone-Tile is Adaptable

ADAPTABILITY to a wide range of practical building requirements is the first essential of any masonry unit.

Stone-Tile hollow concrete brick meets the demand for a building unit that fits any type of construction without the necessity for special plans.

Made in three principal sizes, 3½x11⅛x3½, 5½x11½x3½, and 7½x11½x3½, Stone-Tile can be used for the various thicknesses of walls most generally specified, and is adaptable to arches, jambs, lintels and other structural characteristics of the average building.

Stone-Tile will appeal to clients who require a masonry building unit that is economical, of uniform high quality and combines attractive appearance with fire and weather-proof qualities.

Write for folder, "Stone-Tile is Adaptable," showing the application of Stone-Tile to various building requirements.

The National Stone-Tile Company, Inc.
625 Market Street, San Francisco, California

STONE-TILE
PERMANENT CONSTRUCTION
THE ARCHITECT AND ENGINEER

PROMETHEUS
The Electric Food and Plate Warmer
Wherever meals are cooked and served, in apartments, residences and institutions, Prometheus is a highly valued asset. The wireless heating units placed independently of the shelves keep food hot and tasty until ready to serve and cannot injure the finest china.

Write for information and list of installations
The Prometheus Electric Co.
Manufacturers
511 West 42d Street, New York
Showroom M. E. HAMMOND
Mezzanine Floor Pacific Bldg., San Francisco

DEPENDABILITY
"Since 1855"
LINOLEUMS
WINDOW SHADES
Carpets
Draperies
Rugs
Estimates furnished
D. N. & E.
Walter & Co.
562-572 Mission Street
SAN FRANCISCO
Los Angeles Portland Seattle

"Standard"
THIRTY-SIX years' experience manufacturing and installing Electric Time Keeping Systems. Helpful engineering data cheerfully furnished architects, engineers and school boards insuring satisfactory results, and a direct factory branch office completely equipped to render immediate service.

The Standard Electric Time Company
461 Market St., San Francisco, Cal.
Telephone Sutter 241

Standard Electric Time Company
461 Market St., San Francisco, Cal.
Telephone Sutter 241

DEPARTMENT OF GRADING

Linoleums
Window Shades
Carpets
Draperys
Rugs
Estimates furnished
D. N. & E.
Walter & Co.
562-572 Mission Street
SAN FRANCISCO
Los Angeles Portland Seattle

PROMETHEUS
The Electric Food and Plate Warmer
Wherever meals are cooked and served, in apartments, residences and institutions, Prometheus is a highly valued asset. The wireless heating units placed independently of the shelves keep food hot and tasty until ready to serve and cannot injure the finest china.

Write for information and list of installations
The Prometheus Electric Co.
Manufacturers
511 West 42d Street, New York
Showroom M. E. HAMMOND
Mezzanine Floor Pacific Bldg., San Francisco

DEPENDABILITY
"Since 1855"
LINOLEUMS
WINDOW SHADES
Carpets
Draperys
Rugs
Estimates furnished
D. N. & E.
Walter & Co.
562-572 Mission Street
SAN FRANCISCO
Los Angeles Portland Seattle

"Standard"
THIRTY-SIX years' experience manufacturing and installing Electric Time Keeping Systems. Helpful engineering data cheerfully furnished architects, engineers and school boards insuring satisfactory results, and a direct factory branch office completely equipped to render immediate service.

The Standard Electric Time Company
461 Market St., San Francisco, Cal.
Telephone Sutter 241
Occasionally there is a temptation to look for something cheaper than Von Duprin latches.

In such cases it is well to remember that reliability should be the first consideration in choosing any device on which the safety of human lives will depend.

When you buy Von Duprin Self-Releasing Fire Exit Latches you are buying a known quantity—latches of unquestioned reliability—latches which are built to withstand panic conditions, rather than to meet a price.

In case of a panic in one of your buildings, the knowledge that no Von Duprin, anywhere, has ever failed to operate in an emergency is worth many times over whatever you might have saved by installing less worthy devices.

Being sure IS worth something—a great deal sometimes.
Ask for Catalog 12-L, or see “Sweet’s,” pages 1212-1216.
E. B. Noble, President
A. E. Wilkins, Vice-Pres.

Beam, Angle, Channels, and Universal Mill Plates for immediate shipment from stock

Pacific Rolling Mill Co.
SUPPLIERS OF
FABRICATED STRUCTURAL STEEL, Forgings
Bolts, Rivets, Frogs, Switches, Cast Iron Castings

General Office and Works
17th and MISSISSIPPI STS., SAN FRANCISCO
Telephone Market 213


Western Iron Works
STRUCTURAL IRON AND STEEL CONTRACTORS

Steel Wheel-barrows in Stock
141-147 Beale St. and 132-148 Main St., SAN FRANCISCO
Phones: GARFIELD 2575—2576

Bliss & Faville, Architects

Steel Frame, California State Building, Civic Center, San Francisco.
FABRICATED BY
THE PALM IRON AND BRIDGE WORKS (Incorporated)

15th and R Streets, Sacramento

UNION CONSTRUCTION CO.
CONTRACTORS AND ENGINEERS
Steel for
All Types of Building Construction and Bridges
All Classes of
General Machinery Tank and Pipe Work
Gold Dredges and Their Equipment
BALFOUR BLDG.
San Francisco Sutter 2790
Key Route Basin Oakland Lakeside 6300

When writing to Advertisers please mention this magazine.
NASON'S OPAQUE FLAT FINISH

A VALUABLE OIL PAINT
FOR WALLS, CEILINGS, ETC.
Made in California to stand Pacific Coast climatic condition

R. N. Nason & Co., Paint Makers
PORTLAND
151 Potrero Ave.—SAN FRANCISCO—436 Market St.
SEATTLE

ARCHITECTS' SPECIFICATION INDEX—Continued

BUILDING PAPER
The Paraffine Companies, Inc., San Francisco, Los Angeles, Portland and Seattle.

CABINET MAKERS
Home Manufacturing Company, 513 Brannan St., San Francisco.
Fink & Schindler Co., 218-13th St., San Francisco.
Mullen Manufacturing Company, 64 Rausch St., San Francisco.

CARPETs
John Breuner Co., 281 Geary St., San Francisco.
D. N. & E. Walter, Mission near Second St., San Francisco.
W. & J. Sieane, 216-228 Sutter St., San Francisco.
Edward J. Margett, 61 Ellis St., San Francisco.

CASEMENT WINDOW HARDWARE

CASTINGS

CEMENT
Atlas Portland Cement Co., agencies in all principal Coast cities.
Mt. Diablo, sold by Henry Cowell Lime & Cement Co., 2 Market St., San Francisco.

CEMENT EXTERIOR WATERPROOF PAINT
Armorite, soly by W. P. Fuller & Co., all principal Coast cities.

CEMENT TESTS—CHEMICAL ENGINEERS
Robert W. Hunt & Co., 251 Kearny St., San Francisco.

CLAY PRODUCTS
Cannon & Co., Sacramento, Cal.
Gladding, McBean & Co., Crocker Bldg., San Francisco.
Los Angeles Pressed Brick Co., Frost Bldg., Los Angeles.
Tropic Pottery Inc., Glendale, Calif.
S. & S. Tile Company, San Jose, Calif.

CLOCKS—ELECTRIC TIME
Pacific Electric Clock Co., 714 Wells-Fargo Bldg., San Francisco.
Standard Electric Time Co., 461 Market St., San Francisco.

COLD STORAGE PLANTS
T. P. Jarvis Crude Oil Burning Co., 275 Connecticut St., San Francisco.
Cyclops Iron Works, 837 Folsom St., San Francisco.

COMPOSITION FLOORS
“Linotol” plastic flooring, Hill, Hubbell & Co., 115 Davis St., San Francisco; 419 San Fernando Bldg., Los Angeles.

CONCRETE OR CEMENT HARDENER
Gunn, Carle & Co., Inc., 444 Market St., San Francisco.

CONCRETE MIXERS
Foote and Jaeger mixers sold by Edward R. Bacon Co., 51 Minna St., San Francisco, also Los Angeles.
Ransome mixers sold by the Garfield Co., Hearst Bldg., San Francisco.
Smith-Booth-Usher Co., San Francisco and Los Angeles.

CONCRETE REINFORCEMENT
United States Steel Products Co., San Francisco, Los Angeles, Portland and Seattle.
Twisted Bars, sold by Gunn, Carle & Co., Inc., 444 Market St., San Francisco.
Pacific Coast Steel Company, Rialto Bldg., San Francisco.
Triangle Mesh Fabric, Sales agents, Pacific Materials Co., 325 Market St., San Francisco.
Truscon Steel Co., 372 Tenth St., San Francisco.
Badt-Falk Co., Call-Post Bldg., San Francisco.

CONDUITS
Garnett Young & Co., 612 Howard St., San Francisco.

CONTRACTORS, GENERAL
Barrett & Hilp, 918 Harrison St., San Francisco.
Larsen-Siegrist Co., Inc., 897 Claus Spreckels Bldg., San Francisco.
R. W. Littlefield, 357-12th St., Oakland.
K. E. Parker Co., Inc., Clunie Bldg., San Francisco.
Unit Construction Co., Phelan Bldg., San Francisco.
J. D. Hannah, 142 Sansome St., San Francisco.
Ruegg Bros., California Commercial Union Bldg., San Francisco.

Satinette White Enamel
FLATLINE CABINET FINISH
ELASTICA INSIDE AND ELASTICA EXTERIOR

Standard Varnish Works
53 Stevenson Street
SAN FRANCISCO

When writing to Advertisers please mention this magazine.
ARCHITECTS' SPECIFICATION INDEX—Continued

John M. Bartlett, 357 Twelfth St., Oakland.
Chas. Stockholm & Son, Monadnock Bldg., San Francisco.
Herbert Beckwith, Everson Bldg., Oakland.
Collman & Speidel, 546 Monadnock Bldg., San Francisco.

Clinton Construction Company, 140 Townsend St., San Francisco.
Monson Bros., 251 Kearny St., San Francisco.
Fontanella & Teza, 1582 Eddy St., San Francisco.

Geo. Wagner, 251 Kearny St., San Francisco.
T. B. Goodwin, 180 Jessie St., San Francisco.

Robert Trest, 26th and Howard Sts., San Francisco.
I. M. Sommer, 401 Balboa Bldg., San Francisco.
Jas. L. McLaughlin, 251 Kearny St., San Francisco.

Alfred H. Vogt, 185 Stevenson St., San Francisco.
Lange and Bergstrom, Sharon Bldg., San Francisco and Washington Bldg., Los Angeles.

CONTRACTORS' EQUIPMENT

Edward R. Bacon Co., 51 Minna St., San Francisco, and Los Angeles.

Garfield & Co., Hearst Bldg., San Francisco.

Smith, Booth-Usher Co., 60 Fremont St., San Francisco; 228 Central Ave., Los Angeles.

CONVEYING MACHINERY

Messe & Gottfried, San Francisco, Los Angeles, Portland and Seattle.

CONVENIENCE OUTLETS

Harvey Hubbell, Inc., Bridgeport, Conn., represented in San Francisco by Garnett Young & Co., 612 Howard St.

CORK TILE

David E. Kennedy, Inc., 305 Crocker Bldg., San Francisco.

Van Fleet-Freear Co., Sharon Bldg., San Francisco.

CRUSHED ROCK

Coast Rock & Gravel Co., Call-Post Bldg., San Francisco.

CURTAINS—STEEL, ROLLING, FIREPROOF


DAMP-PROOFING AND WATERPROOFING

Armorite Dam Resisting Paint, made by W. P. Fuller & Co., San Francisco.


“Pacific” Damp-Proofing Compound, sold by the Paraffine Companies, Inc., San Francisco, Los Angeles, Portland and Seattle.

DOOR HANGERS

Mother Door Hanger Company, leading hardware stores.


Stanley Works, New Britain, Conn., Monadnock Bldg., San Francisco.


DRINKING FOUNTAINS


Crawford Company, San Francisco, Oakland, and Los Angeles.

Pacific Porcelain Ware Co., 67 New Montgom- ery St., San Francisco.

Haines, Jones & Cadbury Co., 857 Folsom St., San Francisco.

DUMB WAITERS

Spencer Elevator Company, 166-7th St., San Francisco.

San Francisco Elevator Company, Inc., 860 Folsom St., San Francisco.

ELECTRICAL CONTRACTORS

Butte Electrical Equipment Company, 330 Folsom St., San Francisco.

Butte Electric & Manufacturing Co., 334 Folsom St., San Francisco.

Brown-Langhals Electrical Construction Co., 313 5th St., San Francisco.

Central Electric Company, 185 Stevenson St., San Francisco.

NePage, McKenny Co., 589 Howard St., San Francisco.

Newbury Electrical Co., 359 Sutter St., San Francisco.

Pacific Fire Extinguisher Co., 424 Howard St., San Francisco.

Globe Electric Works, 1959 Mission St., San Francisco.

M. E. Ryan, Redwood City, and 520 Clunie Bldg., San Francisco.

H. S. Tittle, 766 Folsom St., San Francisco.


ELECTRIC PLATE WARMER

The Prometheus Electric Plate Warmer for residences, clubs, hotels, etc. Sold by M. E. Hammond, Pacific Bldg., San Francisco.

ELECTRICAL SUPPLIES AND EQUIPMENT

Garnett Young & Co., 612 Howard St., San Francisco.

Harvey Hubbell, Inc., Bridgeport, Conn., represented in San Francisco by Garnett Young & Co., 612 Howard St.


d Phone Sutter 471

The Pneumatic Painting Machine Co.

G. H. GRENVILLE, Manager

1046 Monadnock Building, S. F.

Telephone Garfield 294

Independent Automatic Sprinkler Company

Fire Protection Engineers

72 Natoma Street, San Francisco

When writing to Advertisers please mention this magazine.
TEMPERATURE REGULATION
JOHNSON SERVICE COMPANY
(OF MILWAUKEE—ESTABLISHED 1885)
Manufacturers and Installers of JOHNSON Heat and Humidity Control
For schools, residences, hospitals, banks, public buildings, also canneries
and all kinds of industrial plants—Hot water tank regulators, air and
water reducing valves.
Rialto Bldg., SAN FRANCISCO; 605 Van Nvys Bldg., LOS ANGELES

ARCHITECTS' SPECIFICATION INDEX—Continued

Safety Electric Company, 56-65 Columbia
Square, San Francisco.
Drendell Electrical & Mfg. Co., 1245 Howard
St., San Francisco.
Western Electric Safety Mfg. Co., Inc., 247
Minna St., San Francisco.

ELEVATORS
Otis Elevator Company, Stockton and North
Point, San Francisco.
Spencer Elevator Company, 166-7th St., San
Francisco.
San Francisco Elevator Co., 860 Folsom St., San
Francisco.

ENGINEERS—CONSULTING, ELECTRICAL,
MECHANICAL
Chas. T. Phillips, Pacific Bldg., San Francisco.
Hunter & Hudson, Rialto Bldg., San Francisco.
Ralph E. Dodge, 251 Kearny St., San Francisco.

ELEVATOR DOOR HARDWARE
Richards-Wilcox Mfg. Co., Underwood Bldg.,
San Francisco.

FAIENCE TILES
Tropico Pottery, Inc., Glendale, Cal.

FELT—ASPHALT, DEADENING
The Paraffine Companies, Inc., San Francisco,
Los Angeles, Portland and Seattle.

FENCES—WIRE AND IRON
Standard Fence Construction Co., 245 Market
St., San Francisco, and 318-12th St., Oakland;
520 Los Angeles St., Los Angeles.

FILLING STATION EQUIPMENT
S. F. Bowser & Co., Inc., 612 Howard St.,
San Francisco.
Wayne Oil Tank & Pump Co., 631 Howard
St., San Francisco, 530 S. Los Angeles St.,
Los Angeles.

FIRE EXIT LATCHES
Vonnegut Hardware Co., Indianapolis, Ind.

FIRE ESCAPES
Michel & Pfeifer Iron Works, 1415 Harrison
St., San Francisco.
Palm Iron & Bridge Works, Sacramento.
Western Iron Works, 141 Beale St., San
Francisco.

FIRE-PROOF DOORS
Forderer Cermic Works, 259 Petreno Ave., San
Francisco.
U. S. Metal Products Co., 330-10th St., San
Francisco.
Fire Protection Products Co., 3117-29th St., San
Francisco.
Kinnear Mfg. Co., represented in San Francisco
by Pacific Materials Co., Underwood Bldg.

FIRE SPRINKLERS—AUTOMATIC
Grinnell Company of the Pacific, 433 Mission
St., San Francisco.
Independent Automatic Sprinkler Co., 72 Natoma
St., San Francisco.
Pacifie Fire Extinguisher Co., 421 Howard St.,
San Francisco.

FIRE RETARDING PAINT
The Paraffine Companies, Inc., 51 First St., San
Francisco.

FIXTURES—BANK, OFFICE, STORE, ETC.
Home Manufacturing Company, 513 Brannan
St., San Francisco.
The Fink & Schindler Co., 218-13th St., San
Francisco.
Mullen Manufacturing Co., 64 Rausch St., San
Francisco.
C. F. Weber & Co., 985 Market St., San Fran-
cisco, and 210 N. Main St., Los Angeles, Cal.

FLOORS—TILE, CORK, ETC.
Mangrum & Otter, 827 Mission St., San Fran-
cisco.
S. & S. Tile Company, San Jose.
Van Fleet-Freear Co., 61 New Montgomery St.,
San Francisco, and 420 S. Spring St., Los
Angeles.
David E. Kennedy, Inc., 305 Crocker Bldg., San
Francisco.

FLOOR VARNISH
Bass-Hueter and San Francisco Pioneer Varnish
Works, 816 Mission St., San Francisco.
Fifteen for Floors, made by W. P. Fuller &
Co., San Francisco.
Standard Varnish Works, Chicago, New York
and San Francisco.
R. N. Nason & Co., San Francisco and Los
Angeles.
The Paraffine Companies, Inc., San Francisco,
Los Angeles, Portland and Seattle.

FLOORS—HARDWOOD
Oak Flooring Manufacturers' Association of the
United States, Ashland Block, Chicago, Ill.
Cadwallader, Gibson Co., 254 Steuart St., San
Francisco.
Parrott & Co., 320 California St., San Fran-
cisco.
Strable Hardwood Company, 511 First St., Oak-
land.
E. L. Bruce Co., Manufacturers, Memphis, Tenn.

FLOORS—MASTIC—FLOOR COVERING
Hill, Hubbard & Company, 115 Davis St., San
Francisco.
The Paraffine Companies, Inc., San Francisco,
Los Angeles, Portland and Seattle.

JOHN A. PETerson, President
B. HEINRICH, Vice-President
SAN FRANCISCO ELEVATOR CO., Inc.
ELEVATORS
Automatic, Electric, Hydraulie, Belt Power, Automatic Dumbwaiters and
Handpower Machines, Push Button Passenger Elevators a Specialty
Telephone Kearny 2413
860 FOLSOM STREET, SAN FRANCISCO

When writing to Advertisers please mention this magazine.
ARCHITECTS' SPECIFICATION INDEX—Continued

FUEL OIL SYSTEMS
S. T. Johnston Co., 1337 Mission St., San Francisco.
S. F. Bowser & Co. Inc., 612 Howard St., San Francisco.
Wayne Oil Tank & Pump Co., 631 Howard St., San Francisco.

FURNACES—WARM AIR
Mangrum & Otter, 827 Mission St., San Francisco.
Montague Range and Furnace Co., 826 Mission St., San Francisco.
Pacific Heating Company, Second and Grove Sts., Oakland.

FURNITURE—BUILT-IN
Hoosier Kitchen Cabinet Store, Pacific Bldg., San Francisco.

FURNITURE—SCHOOL, CHURCH, ETC.
Home Manufacturing Company, 543 Brannan St., San Francisco.
Rucker-Fuller Desk Co., 677 Mission St., San Francisco.
F. W. Wentworth & Co., 539 Market St., San Francisco.
W. & J. Sloane, 216 Sutter St., San Francisco.

GARAGE HARDWARE
The Stanley Works, New Britain, Conn., Coast sales offices, San Francisco, Los Angeles and Seattle, Wash.

GAS STEAM RADIATORS—FUMELESS, ETC.
Ra-Do Fumeless Gas Radiators, manufactured and sold by Baird-Bailache Co., 478 Sutter St., San Francisco.

GLASS
American Window Glass Co., represented by L. H. Butcher Co., 862 Mission St., San Francisco.
Cobbledick-Kibbe Glass Co., 175 Jessie St., San Francisco.
Fuller & Goepp, 32 Page St., San Francisco, and Syndicate Bldg., Oakland.
W. P. Fuller & Company, all principal Coast cities.

GRADING, WRECKING, ETC.
Dolan Wrecking & Construction Co., 1007 Market St., San Francisco.

GRANITE
California Granite Co., Builders' Exchange, San Francisco.
Raymond Granite Co., Potrero Ave., and Division St., San Francisco.

GRAVEL AND SAND
Coast Rock & Gravel Co., Call-Post Bldg., San Francisco.

Del Monte White Sand, sold by Del Monte Precast Co., Crocker Bldg., San Francisco.

GYMNASIUM EQUIPMENT
Ellery Arns Co., 583 Market St., San Francisco.

HARDWARE
Jeost Bros., agents for Russell & Erwin Hardware, 1053 Market St., San Francisco.
The Stanley Works, New Britain, Conn.; Coast sales offices, San Francisco, Los Angeles, and Seattle, Wash.
Corbin hardware, sold by Palace Hardware Co., 281 Market St., San Francisco.
Vonnegut hardware, sold by Abeel-Jensen Co. Call Bldg., San Francisco.

HARDWOOD LUMBER—FINISH, ETC.
Parrott & Co., 320 California St., San Francisco.
Stable Hardware Company, First St., near Broadway, Oakland.
E. L. Bruce Company, American oak flooring, Memphis, Tenn.

HEATERS—AUTOMATIC, GAS, ELECTRIC
Electric Sales Service Co., manufacturers of Therm-elect Water Heater, West Berkeley.
Pittsburg Water Heater Co., 478 Sutter St., San Francisco.
Pure Air Gas Heating Co., 101 Battery St., San Francisco.
Ra-Do Fumeless Gas Heater, sold by Baird-Bailache Company, 478 Sutter St., San Francisco.
Wm. J. Schwerin, Agent Hubert Electric Steam Radiator, Rialto Bldg., San Francisco.

HEATING AND VENTILATING CONTRACTORS' EQUIPMENT, ETC.
Alex Coleman, 706 Ellis St., San Francisco.
Gille-Schmid Company, 198 Ois St., San Francisco.
Hateley & Hateley, Mitau Bldg., Sacramento.
Mangrum & Otter, 327-331 Mission St., San Francisco.
Lawson & Drucker, 450 Hayes St., San Francisco.
James A. Nelson, 517 Sixth St., San Francisco.
William F. Wilson Co., 328 Mason St., San Francisco.
Pacific Fire Extinguisher Co., 424 Howard St., San Francisco.
Mechanical Engineering & Supply Co., 906-7th St., Sacramento.

The Perfect Automatic "Valve"
ARCHITECTS' SPECIFICATION INDEX—Continued

Scott Company, 243 Minna St., San Francisco.
O. M. Simmons Co., 115 Mission St., San Francisco.
Griffin Sheet Metal Works, Fresno.
Tiltz Engineering & Equipment Co., 179 Monadnock Bldg., San Francisco.

HOLLOW TILE BLOCKS
Cannon & Co., plant at Sacramento; 770 O'Farrell St., San Francisco.
Los Angeles Pressed Brick Co., Frost Bldg., Los Angeles.

HOSPITAL FIXTURES
Mott Company of California, 533 Mission St., San Francisco.

HOSPITAL SIGNAL SYSTEM
Chicago Signal Co., represented by Garnett Young & Co., 612 Howard St., San Francisco.

HOTELS
St. Francis Hotel, Powell, Geary and Post Sts., San Francisco.

ICE MAKING MACHINERY
Cyclops Iron Works, 337 Folsom St., San Francisco.

INGOT IRON
"Armor" brand, manufactured by American Rolling Mill Company, Middletown, Ohio, and 10th and Bryant Sts., San Francisco.

INSPECTIONS AND TESTS
Robert W. Hunt & Co., 251 Kearny St., San Francisco.

INSULATION—CORK
Van Fleet-Freear Co., Sharon Bldg., San Francisco.

INSURANCE BROKERS
William Healey & Son, Crocker Bldg., San Francisco.

INTERIOR DECORATORS
Martin & Frederick, 1074 Sutter St., San Francisco.
The Tormey Co., 1612 Larkin St., San Francisco.
A. Quandt & Son, 374 Guerrero St., San Francisco.

JAIL EQUIPMENT
Ralston Iron Works, 20th and Indiana Sts., San Francisco.

KITCHEN CABINETS
Hosier Kitchen Cabinet Store (O. K. Brown, Mgr.), Pacific Bldg., San Francisco.

KITCHEN EQUIPMENT
Griffin Sheet Metal Works, Fresno.

LAMP POSTS, ELECTROLIERS, ETC.
J. L. Mott Iron Works, 553 Mission St., San Francisco.

LANDSCAPE ARCHITECT
Emerson Knight, 764 Market St., San Francisco.

LANDSCAPE GARDENERS
MacRorie-McLaren Co., 111 Powell St., San Francisco.

LATHING AND PLASTERING
MacGuer & Simpson, 226 Tehama St., San Francisco.
A. Knowles, Call-Post Bldg., San Francisco.

LATHING MATERIAL
Pacific Materials Co., 525 Market St., San Francisco.
Trueson Steel Co., Tenth St., near Bryant, San Francisco.

LIGHT, HEAT AND POWER
Great Western Power Company, Stockton St., near Sutter, San Francisco.
Pacific Gas & Electric Co., Sutter St., San Francisco.

LIGHTING FIXTURES
Thomas Day Company, Mission, near Third St., San Francisco, and Oakland.
Roberts Mfg. Co., 663 Mission St., San Francisco.

Electric Appliance Co., 507 Mission St., San Francisco.

LIME
Henry Cowell Lime & Cement Co., 2 Market St., San Francisco.

LINOILEUM
D. N. & E. Walter & Co., 562 Mission St., San Francisco.
The Paraffine Companies, factory in Oakland; office, 34 First St., near Market, San Francisco.
W. & J. Sloane, 216 Sutter St., San Francisco.
David E. Kennedy, Inc., Crocker Bldg., San Francisco.

LUMBER
Dudley Lumber Co., Palo Alto, Cal.
Hart-Wood Lumber Co., Fifth and Berry Sts., San Francisco.
Pope & Talbot, foot of Third St., San Francisco.
Santa Fe Lumber Co., 16 California St., San Francisco.
Sunset Lumber Company, First and Oak Sts., Oakland.

MAGNESITE FLOORING, STUCCO, ETC.
Dorite Mfg. Co., 116 Utah St., San Francisco; Metropolitan Bldg., Los Angeles.

MAIL CHUTES
American Mailing Device Corp., represented on Pacific Coast by Waterhouse-Wilcox Co., 523 Market St., San Francisco.
ARCHITECTS' SPECIFICATION INDEX—Continued

MANTLELS—WOOD, TILE, ETC.
Manzur & Otter, 827-831 Mission St., San Francisco.
Fink & Schindler, 218-12th St., San Francisco.

MANUAL TRAINING EQUIPMENT
Smith-Booth-Usher Co., San Francisco and Los Angeles.

MARBLE
American Marble and Mosaic Co., 25 Columbus Square, San Francisco.
Ray Cook Marble Company, foot of Powell St., Oakland.
Joseph Muste Sons, Keenan Co., 535 N. Point St., San Francisco.
Vermont Marble Co., Coast branches, San Francisco, Portland and Tacoma.
Tompkins-Kiel Marble Company, 505 Fifth Ave., New York; also Chicago, Philadelphia and San Francisco.

METAL DOORS AND WINDOWS
Fire Protection Products Co., 3117-20th St., San Francisco.
Waterhouse-Wilcox Co., Inc., 523 Market St., San Francisco.
U. S. Metal Products Co., 330 Tenth St., San Francisco.

METAL FURNITURE
Forderer Corinice Works, 269 Potrero Ave., San Francisco.

MILL WORK
Dudfield Lumber Co., Palo Alto, Cal.
Pacific Manufacturing Company, San Francisco, Los Angeles, Oakland and Santa Clara.
National Mill and Lumber Co., San Francisco and Oakland.
The Firek & Schindler Co., 218-13th St., San Francisco.

NOTARY PUBLIC
William Healey & Son, 208 Crocker Bldg., San Francisco.

OIL BURNERS
Fess System Co., 229 Natoma St., San Francisco.
S. T. Johnson Co., 1337 Mission St., San Francisco.
G. E. Witt Co., 882 Howard St., San Francisco.
W. S. Ray Manufacturing Co., 29 Spear St., San Francisco.
F. L. Warner, 696-20th St., Oakland.

OIL STORAGE AND DISTRIBUTING STATIONS
S. F. Bowser & Co., Inc., 612 Howard St., San Francisco.
S. T. Johnson Co., 1337 Mission St., San Francisco.
Wayne Oil Tank & Pump Co., 631 Howard St., San Francisco; 830 S. Los Angeles St., Los Angeles.

ORNAMENTAL IRON AND BRONZE
California Artistic Metal and Wire Co., 319 Seventh St., San Francisco.
Federal Ornamental Iron and Bronze Co., 16th St., and San Bruno Ave., San Francisco.
Michel & Pfeiffer Iron Works, 1415 Harrison St., San Francisco.
Palm Iron & Bridge Works, Sacramento.
Schrader Iron Works, Inc., 1247 Harrison St., San Francisco.

OVERHEAD CARRYING SYSTEMS
California Hydraulic Engineering & Supply Co., 70-72 Fremont St., San Francisco.

PANIC DOORS
Vonnegut hardware, sold by Abeel-Jensen Co. Call Bldg., San Francisco.

PAINT FOR STEEL STRUCTURES, BRIDGES, ETC.
The Paraffine Companies, Inc., 34 First St., San Francisco.
Hill, Hubbell & Company, 115 Davis St., San Francisco.

PAINTING—SPRAY EQUIPMENT
Pneumatic Painting Machinery Co., 1946 Monadnock Bldg., San Francisco.

PAINTING, TINTING, ETC.
Atherly Bros., 2022 Polk St., San Francisco.
Wayne & Williams, 1621 Eddy St., San Francisco.
I. R. Kissel, 1747 Sacramento St., San Francisco.
The Torney Co., 681 Geary St., San Francisco.
Flick Bros., 175 Haight St., San Francisco.
A. G. Sandt & Son, 374 Guerrero St., San Francisco.

PAINTS, OILS, ETC.
Magnor Bros., 414-424 Ninth St., San Francisco.
Bass-Hueter Paint Co., Mission, near Fourth St., San Francisco and all principal Coast cities.
W. P. Fuller & Co., all principal Coast cities.
The Paraffine Companies, Inc., San Francisco, Los Angeles, Portland and Seattle.

PARTITIONS—FOLDING AND ROLLING

PIPE—STEEL AND WROUGHT IRON
Western Pipe & Steel Co., 444 Market St., San Francisco; 1758 N. Broadway, Los Angeles.

PIPE FITTINGS

PLASTER

PLASTERING CONTRACTORS
A. Knowles, Call Bldg., San Francisco.
MacGruer & Simpson, 266 Tehama St., San Francisco.

PLUMBING CONTRACTORS
Alex Coleman, 766 Ellis St., San Francisco.
Giley-Schmid Company, 198 Otis St., San Francisco.
Douglas Carl T., 467 21st St., Oakland.
Hateley & Hateley, Midian Bldg., Sacramento.
Scott Co., Inc., 213 Minna St., San Francisco.
Wm. F. Wilson Co., 328 Mason St., San Francisco.
W. H. Picard, 5565 College Ave., Oakland.

PLUMBING FIXTURES, MATERIALS, ETC.
California Steam & Plumbing Supply Co., 671 Fifth St., San Francisco.
Crane Co., San Francisco, Oakland, Los Angeles.
Giley-Schmid Company, 198 Otis St., San Francisco.
Haines, Jones & Cadbury Co., 537 Folsom St., San Francisco.

When writing to Advertisers please mention this magazine.
from tree to Consumer

Pine and Redwood Lumber

SASH DOORS AND MILL WORK

SUNSET LUMBER COMPANY
MANUFACTURERS — WHOLESALE AND RETAIL

Main Office and Yards:
FIRST AND OAK STREETS, OAKLAND
Phone Oakland 1820

POPE & TALBOT
Manufacturers, Exporters and Dealers in
Lumber, Timber, Piles, Spars, Etc.

Office, Yards and Planing Mills
859-869 THIRD STREET, SAN FRANCISCO, CAL.

Mills: Port Gamble, Port Ludlow and Utsalady, Washington

PACIFIC MANUFACTURING COMPANY
MILLWORK, SASH AND DOORS

Hardwood Interior Trim a Specialty

Main Office:
SANTA CLARA, CALIFORNIA

SAN FRANCISCO, 177 Stevenson Street
OAKLAND, 1001 Franklin Street

LOS ANGELES, 908 Washington Building
SAN JOSE, 16 North First Street

When writing to Advertisers please mention this magazine.
BLACKBOARDS
First Grade Natural Slate  Green or Black Composition Board
Estimates Given for Complete Installations  School Furniture and Supplies
STEWART SALES CO.
247 Rialto Building
San Francisco, Cal.

ARCHITECTS’ SPECIFICATION INDEX—Continued

H. Mueller Manufacturing Company, 635 Mission St., San Francisco.
Holbrook, Merrill & Stetson, 64 Sutter St., San Francisco.
Pacific Sanitary Manufacturing Co., 67 New Montgomery St., San Francisco.
West Coast Porcelain Manufacturers, Oceanic Bldg., San Francisco.
POLES AND PILING
Santa Fe Lumber Co., 16 California St., San Francisco.

POWER TRANSMITTING MACHINERY
Meese & Gottfried, San Francisco, Los Angeles; Portland, Ore., and Seattle, Wash.

PRELIMINARY ESTIMATES, VALUATIONS

PUMPS
Chicago Pump Co., represented by Garnett, Young & Co., 612 Howard St., San Francisco.
California Hydraulic Engineering & Supply Co., 70 Fremont St., San Francisco.
Simonds Machinery Co., 117 New Montgomery St., San Francisco.
Ocean Shore Iron Works, 558 Eighth St., San Francisco.
PUMPS—HAND OR POWER, FOR OIL AND GASOLINE
S. F. Bowser & Co., Inc., 612 Howard St., San Francisco.
S. T. Johnson Co., 1337 Mission St., San Francisco.
Wayne Oil Tank & Pump Co., 631 Howard St., San Francisco; 830 S. Los Angeles St., Los Angeles.

QUANTITY SURVEYOR FOR CONTRACTORS

RADIATORS—ELECTRIC STEAM
William J. Schwerin, 217 Rialto Bldg., San Francisco.

REINFORCING STEEL
Edward L. Soule, Rialto Bldg., San Francisco.
Badi-Falk & Co., Call Bldg., San Francisco.
Judson Iron Works, San Francisco and Oakland.
Gunn, Carle & Co., Inc., 444 Market St., San Francisco.
Pacific Coast Steel Co., Rialto Bldg., San Francisco.
Truscon Steel Co., 527-10th St., San Francisco.

REFRIGERATORS
McCray Refrigerator Company, San Francisco office, 765 Mission St.

ROCK AND GRAVEL
Coast Rock & Gravel Co., Call Bldg., San Francisco.

ROOFING AND ROOFING MATERIALS
“Malthoid” and ‘Ruberoid,” also ‘Pabco” ten and twenty year roofs, manufactured by the Parafine Companies, Inc., San Francisco.
H. R. Robertson Co., Hobart Bldg., San Francisco.
Jones Brothers Asbestos Supply Co., 512 Second St., San Francisco.
Johns-Manville Inc., of California, 506 Post St., San Francisco.

RUBBER TILING
New York Belting and Packing Company, 518 Mission St., San Francisco.

RUGS & CARPETS
Edw. J. Margett, 61 Ellis St., San Francisco.
W. & J. Sloane, 216 Sutter St., San Francisco.

SAFETY TREADS
Pacific Materials Co., 525 Market St., San Francisco.

SANDBARK
Coast Rock & Gravel Co., Call Bldg., San Francisco.

SASH AND CABINET CHAINS
Smith & Egge Mfg. Co., Bridgeport, Conn.

SAFE AND VAULTS
Hermann Safe Company, 216 Fremont St., San Francisco.

SCENE PAINTING—DROP CURTAINS, ETC.
The Edwin H. Flagg Scenic Co., 1635 Long Beach Ave., Los Angeles, and 17th and Mission Sts., San Francisco.

SHEATHING AND SOUND DEADENING

Shea Furniture Companies, Inc., 34 First St., San Francisco.

SHEET METAL WORK
Fordor Cornice Works, 269 Potrero Ave., San Francisco.

WM. HEALEY & SON
INSURANCE BROKERS
208 CROCKER BLDG., SAN FRANCISCO

ARE YOU INTERESTED IN INSURANCE? PHONE KEARNY 5—9—1

W. W. Healey, Notary Public

When writing to Advertisers please mention this magazine.
DAVID E. KENNEDY, INC. announce the opening of their Pacific Coast office at 305 Crocker Bldg., San Francisco Under the Management of J. Clyde Peterson

EVERLASTIC TILE FLOORS CORK TILE FLOORS KENCOR BULLETIN BOARDS

ARCHITECTS’ SPECIFICATION INDEX—Continued

SHINGLE STAINS
Bass-Hueter Paint Company, all principal Coast cities.
Cabot’s Creosote Stains, sold by Pacific Bldg., Materials Co., 525 Market St., San Francisco.
Fuller’s Pioneer Shingle Stains, made by W. P. Fuller & Co., San Francisco.

SHINGLES—COMPOSITION, UNIT

STEEL

SHUTTERS—ROLLING, FIRE, STEEL, WOOD
J. G. Wilson Corp., 621 North Broadway, Los Angeles.

SINKS—COMPOSITION

STEEL HEATING BOILERS
Kewanee Boiler, factory branch, Exposition Building, San Francisco.

STEEL TANKS, PIPE, ETC.
Ocean Shore Iron Works, 55 Eighth St., San Francisco.
S. T. Johnson Co., 1337 Mission St., San Francisco.
Western Pipe and Steel Co., 444 Market street, San Francisco.

STEEL AND IRON—STRUCTURAL
Central Iron Works, 621 Florida St., San Francisco.
Michel & Pfeffer Iron Works, 1415 Harrison street, San Francisco.
Mortenson Construction Co., 19th and Indiana Sts., San Francisco.
Pacifi c Rolling Mills, 17th and Mississippi Sts., San Francisco.
Palm Iron & Bridge Works, Sacramento.
U. S. Steel Products Co., Rialto Bldg., San Francisco.
Ralkton Iron Works, 20th and Indiana streets, San Francisco.
Schrader Iron Works, Inc., 1247 Harrison St., San Francisco.
Union Construction Co., 604 Mission street, San Francisco and Key Route Fell, Oakland.
Western Iron Works, 141 Beale St., San Francisco.

STEEL ROLLING DOORS
Kinnear Rolling Steel Doors, sold by Pacific Building Materials Co., Underwood Bldg., San Francisco.


STEEL SASH
Bayley-Springfield solid steel sash, sold by Pacific Materials Co., 525 Market St., San Francisco.
Michel & Pfeffer Iron Works, 1415 Harrison street, San Francisco.

U. S. Metal Products Company, 330 Tenth St., San Francisco.
Truscon Steel Company, 527 Tenth street, San Francisco.

STORE FRONTS

STUDDING—FIREPROOF STEEL
Steel Studding Company, 1216 Folsom St., San Francisco.

SUMP AND BILGE PUMPS
California Hydraulic Engineering & Supply Co., 10-72 Fremont St., San Francisco.

SWITCHES AND SWITCHBOARDS
Safety Electric Co., 59 Columbia Square, San Francisco.
Western Electric Safety Switch Co., Inc., 247 Minna street, San Francisco.
Meyer's Safety Switch Co., 375 Howard Street, San Francisco.

THEATER AND OPERA CHAIRS
Rucker-Fuller Desk Co., 677 Mission street, San Francisco.

THERMOSTATS FOR HEAT REGULATION
Johnson Service, Rialto Bldg., San Francisco.

TILE FOR Roofs, MANTELs, ETC
Cannon & Co., Sacramento; and 77 O'Farrell St. San Francisco.
Gladding, McBean & Co., Crocker Bldg., San Francisco.
S. & S. Tile Co., 4th and Carrie streets, San Jose.

W. & J. SLOANE
216-228 SUTTER STREET
SAN FRANCISCO
P hone: GARFIELD 2838

LINOLEUMS window shades
CARPETS
Furniture

When writing to Advertisers please mention this magazine.
THE ARCHITECT AND ENGINEER

M. E. RYAN
ELECTRICAL CONTRACTOR
SAN FRANCISCO
519 California St.—Phone Garfield 3159

ARCHITECTS’ SPECIFICATION INDEX—Continued

TILE—STONE—CEMENT
National Stone Tile Company, Inc., Merchants
National Bank Building, San Francisco.

TRANSMISSION MACHINERY
Moore & Gottfried Co., San Francisco, Los
Angeles, Portland and Seattle.

TRAVELING CRANES
Cyclus Iron Works, 337 Folsom St., San Fran-
cisco.

VALVES—PIPES AND FITTINGS
Crane Radiator Valves, manufactured by Crane
Co., Second and Brannan Sts., San Francisco.
Grinnell Co., 453 Mission St., San Francisco.
O. M. Simmons Co., 115 Mission St., San Fran-
cisco.
Francisco.
Kennedy Valve Mfg. Co., 23-25 Minna street,
San Francisco.
Victory Manufacturing Co., Monadnock building,
San Francisco.

VALVE PACKING
N. H. Cook Belting Co., 317 Howard St., San
Francisco.
Everlasting Blow-off Valves, General Machinery
and Supply Co., 29 Stevenson street, San Fran-
cisco.

VARNISHES
Bass-Hueter Paint Company, Mission, near 4th
street, San Francisco, and all principal Coast
cities.
W. P. Fuller Co., all principal Coast cities.
R. N. Nason & Co., San Francisco, Los Angeles,
Portland and Seattle.
Standard Varnish Works, 55 Stevenson St., San
Francisco.

VENETIAN BLINDS, AWININGS, ETC.
C. F. Weber & Co., 952 Market St., San Fran-
cisco.
Western Blind & Screen Co., 2702 Long Beach
Ave., Los Angeles.

VITREOUS CHINAWARE
Pacific Porcelain Ware Company, 67 New Mont-
gomery St., San Francisco.
West Coast Porcelain Manufacturers, Rialto
Building, San Francisco.
WALL BEDS, SEATS, ETC.
Marshall & Stearns Co., 1154 Phelan Bldg., San
Francisco.
California Wall Bed Company, Inc, 714 Market
St., San Francisco.

WALL BOARD
"Amiwad" and "Pahco," manufactured by The
Paraffine Companies, Inc., San Francisco, Los
Angeles, Portland and Seattle.

WALL PAINT
Nason’s Opaque Flat Finish, manufactured by
R. N. Nason & Co., San Francisco, Portland
and Los Angeles.

WALL PAPER AND DRAPERIES
The Torny Co., 681 Geary St., San Francisco.
W. & J. Sloan, 216-228 Sutter St., San Fran-
cisco.
Uhl Bros., San Francisco.

WARDROBES—HYGENIC, SCHOOL
J. G. Wilson Corp, 621 North Broadway, Los
Angeles.

WATERPROOFING (see Damp-proofing)

WATER SUPPLY SYSTEMS
Kewanee Water Supply System—Simonds Ma-
achinery Co., agents, 117 New Montgomery St.,
San Francisco.
Smith-Booth-Usher Co., San Francisco and Los
Angeles.

WHEELBARROWS—STEEL
Western Iron Works, Beale and Main Sts., San
Francisco.

WHITE ENAMEL
"Gold Seal," manufactured and sold by Bass-
Hueter Paint Co. All principal Coast cities.
"Silkenwhite," made by W. P. Fuller & Co., San
Francisco.
"Satinette," Standard Varnish Works, 55 Steve-
non St., San Francisco.
The Paraffine Companies, Inc., 34 First St., San
Francisco, Los Angeles, Portland and Seattle.

WINDO W SASH CHAIN
The Smith & Edge Mfg. Co., Bridgeport, Conn.
Coast agents, Rawlins & Smith, 507 Mission
street, San Francisco, and I. W. Hellman
Bldg., Los Angeles.

WINDO W SHADES
D. N. & E. Walter, 562 Mission street, San
Francisco.

WINDOWS, REVERSIBLE, CASEMENT, ETC.
Crittall Casement Window Co., Detroit; Water-
house & Wilcox, San Francisco, representa-
tives.
Hauser Window Co., 137 Minna St., San Fran-
cisco.
J. G. Wilson Corporation, 621 N. Broadway, Los
Angeles; Waterhouse-Wilcox Co., Underwood
Bldg., San Francisco.

WIRE FENCE
Standard Fence Co., 243 Market street, San
Francisco; and 310 12th street, Oakland.

GLOBE AUTOMATIC SPRINKLERS
Will protect your building and bussiness from destruction by
fire and reduce your Insurance Rate. Write for estimates.

Pacific Fire Extinguisher Company
FIRE PROTECTION ENGINEERS
424-440 Howard Street, San Francisco
Manufacturing Plant, 298 Fremont St.

When writing to Advertisers please mention this magazine.
Save Your Clients
This Bitter Experience

Japanese Oak Flooring is now offered in the West, at an attractively low price, as a substitute for American Oak Flooring.

Note These Facts About It

Many cases are on record where builders have been obliged to rip up this inferior Japanese Flooring shortly after putting it down.

To the expert eye Japanese Oak Flooring at once betrays its inferiority by its brittle, brashy nature, its spotted appearance, dead finish and total lack of the beautiful graining which is characteristic of American Oak.

We ask architects and engineers to watch all jobs where Oak Flooring is specified in order to protect their clients against this substitution—which proves so costly in the end.

A request brings you our three handsome booklets, in colors, giving accurate and reliable information about American Oak Flooring. Write for them today.

OAK FLOORING
of the U. S.
1036 Ashland Block, Chicago, Ill.
"Simple--Strong--Efficient"

That's what users say of the
STEWARD
Tilting Drum
CONCRETE MIXERS
with
Hercules Engine drive
And there's one thing more to add—they're
Reasonably Priced

For sale by
Smith-Booth-Usher Co.
CONTRACTORS AND INDUSTRIAL EQUIPMENT
SAN FRANCISCO
50-60 Fremont Street
LOS ANGELES
228-238 Central Avenue

Everything OPENLY PRICED in our Illustrated Priced Stock Bulletin

Steel Water Tanks
For High Buildings
For High Pressure Water Systems, Automatic Fire Sprinklers, etc.

ALSO:
Designers, Fabricators and Erectors of General Plate Work, including Hydro-Pneumatic Pressure Tanks, Hemispherical Bottom Tanks and Towers, Oil and Water Tanks, Pipe Lines, Etc. "Western" Corrugated Culvert Pipe

Western Pipe and Steel Company
OF CALIFORNIA

444 MARKET STREET
SAN FRANCISCO
1758 NORTH BROADWAY
LOS ANGELES

When writing to Advertisers please mention this magazine.
APARTMENT HOUSE, O'FARRELL ST., NEAR JONES
SAN FRANCISCO, FOR MR. CARL H. PETERSON
August G. Headman, Architect

33000 feet $^{13/16}$" x $2^{1/4}$" Clear Plain White
Oak Flooring—“Acorn” Brand
Used Throughout this Building

STRABLE HARDWOOD COMPANY
Distributors ACORN BRAND Oak Flooring
OAKLAND CALIFORNIA

When writing to Advertisers please mention this magazine.
English Casements and Windows
for banks, offices, schools, hospitals, etc.

for artistic residences and other substantial buildings

Made in varied designs to meet all conditions

CRITTALL
Steel Casements
CRITTALL CASEMENT WINDOW COMPANY
Manufacturers Detroit Michigan

Lupton
INVESTMENT VALUE
Steel Sash Products
Lupton Factory Sash
Lupton Counterbalanced Sash
Lupton School House Sash
Lupton Steel Partition and Doors
Pond Continuous Sash
Pond Operating Device

WATERHOUSE-WILCOX CO., Agents
San Francisco Los Angeles San Diego

F. T. CROWE CO. CONSOLIDATED SUPPLY CO. J. McCRACKEN CO.
Seattle Spokane Portland

When writing to Advertisers please mention this magazine.
"To every action there is an equal and contrary reaction."

Newton's Laws of Motion.

Every schoolboy knows the above law, quotes it glibly, demonstrates it knowingly. Its applications are many and varied.

Sunday Morning Thoughts

One of our men who lives down the Peninsula was inspecting his home this last Sunday. It was a new bungalow, stucco, well-designed and pleasing to the eye. When he bought it a year ago the paint was scarcely dry. It looked good. Much to his disgust and chagrin he found the paint peeling, blistering, checking. He knew the answer,—camouflaged paint. "To every action there is an equal and contrary reaction." Moral: The negligent parties in this transaction have lost the owner's good will and further business.

Our Message to Architects

You are commissioned to plan, supervise, and construct a public edifice, a modern office building, a hotel, theatre, or home. Your specifications call for Fuller's paints or equal. When the building is constructed and the opening day is a matter of history, when two or three years have passed, what is going to be the owner's opinion of you and the painting contractor? Is it going to be valuable because dependable paints were used? Is the owner going to be pleased with the building because his redecorating costs are negligible? We repeat, "To every action there is an equal and contrary reaction." Avoid these contrary reactions by specifying Fuller's.

A Few Fuller Dependable Products

Fuller's Pioneer White Lead
Fuller's Pure Colors in Oil
Fuller's Washable Wall Finish
Fuller's Fifteen for Floors Varnish
Fuller's Silkwhite Enamel
Fuller's Factory White Enamel

W. P. Fuller & Co.
Steam Heating and Ventilating
For Commercial and Public Buildings
Furnace Heating for the Home
Mangrum & Otter, Inc.
827-831 Mission Street San Francisco, Cal.
Phone Kearny 3155

S. & S. TILE CO. A. L. SOLON and E.P.SCHEMMEL
MANUFACTURERS OF
HAND-MADE TILES FOR WALLS AND FLOORS.
REPRODUCTIONS OF OLD SPANISH AND
MOORISH GLAZED TILES.
Factory, 4th and Carrie Sts. San Jose, Cal.

SASH CHAIN
Made of
"Giant Metal," "Red Metal" and Steel
Further information on request See page 1092 Sweet's Catalog
THE SMITH & EGGE MFG. CO.
Originators of Sash Chains RAWLINS & SMITH. Coast Agents
Bridgeport, Connecticut 507 Mission St., San Francisco
513 I. W. Hellman Bldg., Los Angeles

GLADDING, McBEAN & CO.
MANUFACTURERS
CLAY PRODUCTS
CROCKER BUILDING SAN FRANCISCO
WORKS, LINCOLN, CAL.

When writing to Advertisers please mention this magazine.
A Pleasing Application of White Cement Stucco

The above photographs of Mr. Samuel Heller's "Little Orchard Farm" at White Plains, N. Y., reveal a dignified simplicity of wall treatment, together with a correct proportioning of detail, which command unusual interest. The Architect specified stucco made with Medusa Stainless White Cement, applied over metal lath. The finish coat was rough cast, showing sweeping marks left by the trowel.

These pictures suggest the unique and interesting possibilities of stucco work done in Medusa White, a true Non-Staining White Portland Cement. In its original whiteness, or tinted to any desired shade, it offers unlimited opportunities to obtain distinctive effects in stucco textures.

Architects may specify Medusa White Cement, plain, or with Medusa Waterproofing added at the mill in just the right proportions to make the work permanently damp-proof.

Attractive booklets, just out, describing Medusa White Cement and Medusa Waterproofing, give explicit specifications for use, along with interesting illustrations. We shall be pleased to send them.

Medusa White Cement and Medusa Waterproofing are carried in stock and sold by leading building-supply dealers in California, Oregon and Washington.

THE SANDUSKY CEMENT COMPANY, Department P, Cleveland, Ohio

Manufacturers of Medusa Stainless White Cement (Plain and Waterproofed); Medusa Gray Portland Cement (Plain and Waterproofed); and Medusa Waterproofing (Powder or Paste).
The Ford car unfailingly answers the needs of the man who desires economical and dependable motor transportation.

The Ford is a valuable ally of the business concern and indispensable to the salesman or the sales force that wishes to cover an extensive territory at the least cost and with the greatest speed.

For eighteen years, we have catered to the needs of the Ford buying public. In our new location and our new building at 11th and Market streets we are in a better position than ever to serve.

Visit our new sales and service quarters. Night service in the garage.

William L. Hughson Co.

Since 1903

Market at 11th Street, San Francisco
Park 4380

Seattle Portland Oakland Los Angeles San Diego
BRUCE Design
OAK FLOORING

Now places what has commonly been called "parquetry" flooring within reach of the average builder's purse. Heretofore its use has necessarily been restricted to the more expensive homes because of much higher cost.

Now comes the Bruce method of quantity production by which the cost of making has been so reduced as to allow installation in homes of moderate cost, at very slight additional expense over that of standard strip flooring.

Bruce Designs Make Beautiful Floors

Patterns are furnished 13/16 in. thick and in 2 1/4 in. or 1 1/2 in. face. The flooring is tongue and groove on opposite sides, grooved at each end, and slip tongues or splines are furnished free.

Send at once for our new catalog describing and illustrating a wide variety of designs, instructions and valuable information.

E. L. BRUCE COMPANY, Manufacturers

MEMPHIS TENNESSEE

When writing to Advertisers please mention this magazine.
Wherever there is need for refrigeration service, in the small or large residence, hotel, hospital or institution, there is a McCray to meet that need. More than 30 years' devotion to the problems of refrigeration has made the McCray standard equipment.

Write today for the New McCray catalogs.

McCRAy RefrigErator CO.
2261 LAKE STREET
KENDALLVILLE, IND.

For residences

The General Fireproofing Company
Manufacturers of
Herringbone Rigid Metal Lath, Corner Bead, Self Sentering, Peds, Diamond Mesh Lath, and waterproofing materials for Concrete

Write for booklet describing, and answering every possible question you may ask concerning the use of fireproof and waterproof materials

No. 20 Beale Street
San Francisco

Telephone Douglas 6616 Piedmont 4955 W

The Gold Medal Mail Chute
Installed in the New San Francisco City Hall and the White Marble Building Los Angeles

Given highest award at Panama-Pacific International Exposition 1915

Waterhouse-Wilcox Co., California Representatives
523 Market Street San Francisco
331 E. 4th Street Los Angeles

The J. McFracken Co., Portland, Ore.

American Mailing Device Corporation

Not only Mixers
but a full line of nationally-known equipment, as well.
We have prepared for a brisk building season.

"Get it from Bacon"

Edward R. Bacon Company
51-61 Minna Street, San Francisco
165 E. Jefferson St.
Los Angeles
ARCHITECTS and engineers who conscientiously strive to give their clients satisfaction invariably choose Wayne equipment.
Accuracy, dependability, economy, safety and long life are inherent qualities of Wayne gasoline and oil systems. Wayne engineers will gladly co-operate with you in working out any of your problems.

**Wayne Oil Tank & Pump Company**
746 Canal Street
Ft. Wayne, Ind.
San Francisco Office
631-633 Howard Street
Phone Garfield 1550
Los Angeles Office
830 S. Los Angeles Street
Phone Main 1600

**OIL CONSERVATION SYSTEMS**

Here is something cheery about a White Cement House that appeals to the owner. Possibly that is why Stucco Homes have grown to be so popular in California in recent years.

**Del Monte White Sand**

and

**Fan Shell Beach Sand**

used with a White Cement make a perfect stucco finish.

**Del Monte Properties Co.**
401 Crocker Building
Phone Sutter 6130 San Francisco
TEAM WORK

with architects and engineers
in
FURNISHING and INSTALLING

Steel Bars

May we tell you how we have saved clients substantial sums in erection costs on recent jobs?

444 Market Street
Phone Sutter 2720

STEEL BARS

Largest Stock of
Reinforcing Bars and
Fire Proof Material
on the Pacific Coast

TRUSCON DAYLIGHT SASH
All Sizes Carried in Stock

SAN FRANCISCO WAREHOUSE

TRUSCON STEEL COMPANY

CHAS. HOLLOWAY, JR., Branch Manager
527 Tenth Street, San Francisco

When writing to Advertisers please mention this magazine.
Becoming more popular every day

The advantages of R-W Air-Way multifold window hardware are recognized at once. No other hardware allows full opening, regardless of width, without interference with inside drapes or outside screens.

Write for Catalog F-1

Richards-Wilcox Mfg. Co.

San Francisco Office

AURORA, ILLINOIS, U.S.A.

New York Office

525 Market Street

Sewage Ejectors Bilge Pumps
Condensation Pumps and Receivers
Return Line Vacuum Pumps
Horizontal Centrifugal Pumps

CHICAGO PUMP COMPANY

Telephone: Douglas 4220

GARNETT YOUNG and COMPANY
612 Howard Street, San Francisco

SEATTLE LOS ANGELES PORTLAND

When writing to Advertisers please mention this magazine.
PITCHER DOOR HANGERS

Give Service
Satisfaction

Are Dependable
Durable and
Economical

No extra thickness of wall required. Installed in 5½ inch partitions. Specify sliding doors in place of swinging doors.

MANUFACTURED BY
National Mill and Lumber Company

Kearny 318 Market Street
3 S 8 0
SAN FRANCISCO

ONE of the refinements that gives distinction to the new Sheridan Plaza is the glass used in its windows.

The window glass throughout this hotel is a product of the American Window Glass Company.

American Window Glass is distinctly a quality product, made to meet exacting requirements both in double or single strength. Its evenness and freedom from imperfections invariably win it preference.

American Window Glass Co.
GENERAL OFFICES, PITTSBURGH, PA.
Branches in leading cities
as listed in Sweets

Pacific Coast Sales Representatives
THE L. H. BUTCHER COMPANY

SHERIDAN PLAZA HOTEL
Chicago, Ill.
Architect, WALTER K. AHLSCHLAGER
Glazed by SHARP, PARTRIDGE & CO.
Alvarado—F. C. Harvey
Bakersfield—Max Gundlach
Burlingame—H. L. Lauder
Chico—C. C. DeMarais
Dinuba—King S. Ford
Concord—F. L. Keller Co.
Centerville—Geo. A. Coit
Exeter—Exeter Plumbing Co.
Eureka—Thomas Warren
Fresno—Ira O. Arms
Gilroy—Chappell & Son
Galt—Opdyke & Wright
Hawaii—Durant-Irvine Co.
Hanford—Ford & Berry
Healdsburg—A. W. Garrett
Hollister—D. J. Lawn
Kingsburg—Kingsburg Pl. Co.
Lodi—Henderson Bros.
Lindsay—City Pl. & M. Works
Lemoore—Poladexter & Shoegard
Los Angeles—Starr-Rupp Co.
Klink—March Lumber Co.
King City—Irving Kelley
Le Grande, Ore.—Carr Furn. Co.
Martines—E. Morsen
Martines—McNamara & Coots
Modesto—H. A. Trueblood
Merced—R. Barrcroft
Marysville—Booth & Herbooth
Monterey—Fierce & Tolle
Napa—Sampson-Rossi H. Co.
Mountain View—H. J. Mockbee
Niles—C. R. Abott
Patterson—E. L. Fink
Madera—Dean Bros.
Newman—Wm. A. Eaton
Oroville—F. M. Savage Co.
Palo Alto—Christensen & Anderson
Palo Alto—Cashel Bros.
Porterville—C. V. Hamilton
Petaluma—Park A. Van Beber
Petaluma—A. F. Tomasini Co.
Petaluma—Schlukenbler Co.
Pittsburg—McFaul Furniture Co.
Pleasanton—Cruikshank & Kohn
Pleasanton—Peter Breus
Portland, Ore.—Crane Co.
Redwood—R. C. Holmquist
Redwood—Ben C. Zimmermann
Reddley—Reddley Plg Co.
Selma—L. T. Wright
Sonoma—Sam Sebastioni
San Diego—Mach's Supply Co.
San Luis Obispo—R. C. Hoyt
Salinas—Anderson & Dougherty
Seattle, Wash.—Crane Co.
Santa Maria—Krelle Plg Co.
Spokane, Wash.—Crane Co.
Santa Cruz—Whitney Bros.
Stockton—Miller-Hays Co.
Stockton—Walter C. Mann
Stockton—Wm. Walsh
Stockton—F. H. Tschiersky
San Rafael—Geo. A. Shields
Sacramento—Crane Co.
San Jose—H. Molsen
Santa Rosa—L. W. Spaulding
San Francisco—M. E. Hammond
Turlock—Andy Thorson
Turlock—Turlock Plg Co.
Tulare—Tulare Plumbing Co.
Tacoma, Wash.—Crane Co.
Sioux City, Iowa—W. W. Beach Co.
Tracy—Tracy Lumber Co.
Ukiah—Barker & Son
Visalia—Visalia Plumbing Co.
Vallejo—Winchell Holwe, Co.
Venice Hill—March Lumber Co.
Watsonville—P. J. Freiremuth
Walnut Creek—W. L. Mausy

P E T R I U M  S A N I T A R Y  S I N K  C O M P A N Y
Factory and Office, West Berkeley, Cal.
JOHN TRAYNOR
CHARLES HARCOURT

OCEAN SHORE IRON WORKS
Manufacturers of
BOILERS, STEEL TANKS, STEEL PLATE SPECIALTIES
Dealers in
BOILERS, TANKS, PUMPS, ENGINES
GENERAL MACHINERY, ETC.

Office and Works: 550-558 EIGHTH STREET
Phones Market 462 and 463
SAN FRANCISCO, CAL.

MAGNESITE STUCCO
AND FLOORING
MAGNESITE
WATERPROOF
FINISH

DORITE
MANUFACTURED BY THE
DORITE MANUFACTURING CO.
116 UTAH STREET, SAN FRANCISCO

AGENCIES:
METROPOLITAN BLDG., LOS ANGELES
501 5TH AVENUE, N. Y.

CONTRACTOR'S MACHINERY
OSHKOSH PAVERS
OSHKOSH MIXERS
INSLEY GRAVITY PLANTS
OSHKOSH EVEREADY SAW RIGS
INSLEY STEEL CARS and TRACK
HOISTING BUCKETS, HOPPERS, GATES, ETC.
STEAM AND ELECTRIC HOISTS
EVERYTHING USED BY CONTRACTORS
CARRIED IN STOCK BY
GARFIELD & CO.
HEARST BUILDING, SAN FRANCISCO
PHONE SUTTER 1036

ALL CAST IRON—3 Sizes (3, 5, and 7 Sections)
RA-DO FUMELESS GAS RADIATORS
The Ideal "Year-Round" Heating System
For The Home—New or Old
Easiest and Cheapest to Install
Lowest Operating Cost
BAIRD-BALHACHE COMPANY
MANUFACTURERS
478 Sutter St., San Francisco
Phone Sutter 6858

When writing to Advertisers please mention this magazine.
Each shipment of "OLD MISSION" Portland Cement is guaranteed not only to equal but to surpass all requirements of the standard specifications for Portland Cement as adopted by the U. S. Government and by the American Society for Testing Materials. A Guarantee Certificate is mailed with the bill of lading of each car, giving number of car, date packed, and number of barrels, over the signature of the chief chemist.
NO FLUE OR VENT

Gas Heating Appliances

Guaranteed Free From Odor and Moisture

Pure Air Gas Heating Co.

401 BATTERY STREET

PHONE DOUGLAS 2983

SAN FRANCISCO, CAL.

AMERICAN - LARSON

SUCTION VENTILATOR

Economical Efficient

Will exhaust 100% to 400% more air than any other ventilator.

It is the first ventilator designed on the siphon principle that applies that principal in a logical way.

Manufactured in California by

U.S. Metal Products Co.

330 TENTH STREET

SAN FRANCISCO

Phone Market 1150

Hauser Reversible

THIS Modern Apartment House in San Francisco designed by Architect E. E. Young, is equipped with the Hauser Type Fixture.

 Manufactured and Installed by

Hauser Window Co.

157 Minna Street Phone Kearny 3706

SAN FRANCISCO

When writing to Advertisers please mention this magazine.
Onondago—
A rich, light cream buff monotone marble. Taking a beautiful high polish—sound in texture.

SECURITY BANK, ST. LOUIS, MO.
(Entrance Vestibule)
Marble—Onondago

Onondago Golden Vein—
A dark cream buff marble with rich golden veining. A really beautiful marble of the highest grade.

CHAPEL, ST. LOUIS, MO.
(Halls and Corridor)
Marble—Onondago

Samples furnished on request

TOMPKINS-KIEL MARBLE COMPANY
505 FIFTH AVENUE
NEW YORK CITY
CHICAGO PHILADELPHIA SAN FRANCISCO
QUALITY HARDWARE

Locks and Builders' Hardware

PALACE HARDWARE CO.
"San Francisco's Leading Hardware Store"  581 MARKET STREET. SUTTER 6060

Kewanee Water System

Simonds Machinery Co.
117-121 New Montgomery St.
SAN FRANCISCO
Phone Kearny 1157

UHL BROS.
San Francisco
Oakland
Seattle
Los Angeles
Portland

For Hotels
Apartment Houses
Hospitals
Factories
Etc.

Murphy Varnishes and Enamels

Pack your Radiator Valves with Palmetto Twist Packing
It can be unstranded to fit any size Valve. It does not get hard

H. N. COOK BELTING CO.
401-433 Howard St., San Francisco, Cal.

When writing to Advertisers please mention this magazine.
ARMSTRONG'S CORK TILE

The Working Space Floor

FURNISHED AND INSTALLED
BY

VAN FLEET-FREEAR CO.

420 SOUTH SPRING ST. 61 NEW MONTGOMERY ST.

LOS ANGELES SAN FRANCISCO

Cabot's

Old Virginia White

A Soft, Brilliant White for Shingles, Siding and Similar Woodwork. As Bright and Clean as New Whitewash, and as lasting as Paint.

Architects and others have tried for years to get a paint that would give the same beautiful, brilliant white as new whitewash, and would also be durable and clean and not rub off like whitewash. But paint was always "painty"—hard, cold and heavy. Old Virginia White is a shingle-stain compound that has solved the problem. It is as clean, cool and brilliant as fresh whitewash, and as lasting as paint; but it is not messy like whitewash, nor "painty" like paint, although it costs less and goes farther than paint.

Send for Sample Shingle and Circular showing other fine houses finished with Old Virginia White


Cabot's Creosote Stains, Stucco and Brick Stains, "Quilt," Mortar Colors, Dampproofing, Waterproofing, Conservo Wood Preservative, etc.

Pacific Materials Co., San Francisco

The Waterhouse-Wilcox Co., Los Angeles

S. W. R. Dally, Seattle

Timms, Cress & Co., Portland

Theo. F. Snyder, San Diego, Cal.

When writing to Advertisers please mention this magazine.
Fuller & Goepp
32 Page Street  San Francisco
Telephone  Market 498

MANUFACTURERS OF
ART AND LEADED GLASS MIRRORS

Dealers in WHITE Glass for Table Tops, Counter Tops, Sink Backs, Etc. Complete Stock—Prompt Deliveries

Oakland Office, Jackson at 11th  Tel. Lakeside 7272

CANNON & CO.
Clay Products

Denison Interlocking Tile
Face Brick
Hollow Tile
Roof and Floor Tile

Factory and General Offices:
SACRAMENTO, CALIFORNIA

When writing to Advertisers please mention this magazine.
Saved the **other Million Dollars**!

Already a million dollar damage—one-half the great car barn a seething cauldron, and the fire sweeping onward. Then it came to the Kinnear Doors—and stopped!

![Fire Stopped Here](image)

Ninety street cars and the remainder of the building had been saved. This represented a saving of over a million dollars. After 20 years of vigilance—of being on the job day and night—the Kinnear Rolling Doors of the Devon Avenue barns, installed in 1901 by the Chicago Surface Lines, were called on to show their true worth.

And in this they fully maintained the reputation of Kinnear Doors for over a quarter of a century as real protection against fire and thieving.

Protection of inestimable value—yet Kinnear Doors are so perfectly balanced and so carefully made they actually add to the efficiency of a building.

Let our engineering Department tell you (without obligation on your part) how you can benefit by using KINNEAR DOORS.

**The Kinnear Manufacturing Co.**

661-671 Field Avenue

Columbus, Ohio
Ray Rotary Fuel Oil Burners

For Steam and Hot Water Boilers
ADAPTED TO ANY TYPE OF BOILER OR FURNACE—High or Low Pressure, 10 to 300 H. P.

We pioneered and developed the horizontal type Rotary Burner.

This principle is sound, as the trend of all burner design is toward this type.

Don’t confuse the Ray with other Rotary Burners. We are the largest manufacturers of Rotary Burners in the world. Recent contracts of the Westinghouse Electric Manufacturing Company covered over four thousand motors.

The Ray Oil Burning system is covered by twenty United States Patents.

This represents ten years of research and development work.

Can you afford to buy experiments—just born?

No matter what your troubles are we can eliminate them with the Ray system.

We guarantee the Ray to be the most efficient burner on the market.

W. S. RAY MANUFACTURING CO.
Manufacturers of Ray Crude Oil Burners
Ray Oil, Gas, Coal or Wood Heavy Steel Ranges

OFFICE AND SALESROOM:
29 Spear St., SAN FRANCISCO
Phone Douglas 8079

PLANT AND SERVICE:
Bosworth, Milton and S. P. R. R.
Phone Mission 5022

OAKLAND DISTRIBUTOR:
The Ray Oil Burning Systems
F. L. Warner, Manager

Distributors
in all Principal Cities
696 20th Street, Oakland, Calif.
Phone Oakland 3941

ARCHITECTS • BUILDERS • CONTRACTORS

MODERN CONDITIONS practically DEMAND gas heating. Be fore-handed and include provision for the use of GAS HEATING APPLIANCES in your plans and construction program. If an estimate on a complete heating system will help, do not hesitate to call on us.

Pacific Gas and Electric Company

SPECIFY

SCHROEDER

DIRECT - FLUSH

VALVES

Schroeder Valve Equipped With Oscillating Handle

"THE SCHROEDER'S CORRECT—ITS FLUSH IS DIRECT"

STANDARD METALS MANUFACTURING CO.

Main Office and Factory
1300-1302 No. Main St., Los Angeles
San Francisco Office
16 Steuart St., Douglas 1134
Sales Representatives: San Diego, Portland, Seattle, Salt Lake City, Denver, Phoenix

When writing to Advertisers please mention this magazine.
FESS SYSTEM TURBINE FUEL OIL BURNER

"Worthy of your consideration"

We are the originators of the mechanical atomizing type oil burner and the largest exclusive manufacturers of oil burning equipment in the west. All parts of our equipment are manufactured in our own plant, thereby assuring prompt and efficient service at all times.

Specify "FESS SYSTEM"—it has no equal

FESS SYSTEM COMPANY, Inc.
218-220 Natoma St., San Francisco.
Phones Sutter 6927-6928

Agencies in all principal cities
Member of the Oil Burners Manufacturers' Association of California

SIMPLEX BURNERS


BUNTING IRON WORKS
1215 FIRST NATIONAL BANK BLDG.
Factory BERKELEY  SAN FRANCISCO Phone Sutter 3225

Member of the Oil Burners Manufacturers' Association of California

OIL BURNER EQUIPMENTS

Low Pressure Air and Rotary Mechanical Atomizing Types
Refrigerating and Ice-Making Machines
Direct Expansion and Brine Circulating Systems

T. P. JARVIS MANUFACTURING CO.
CONTRACTING ENGINEERS AND MANUFACTURERS
275 Connecticut Street, San Francisco
Phone Market 3397
Member of the Oil Burners Manufacturers' Association of California

JOHNSON'S ROTARY CRUDE OIL BURNER

Can be installed in any BOILER or FURNACE
Gives Satisfactory Results
Simple to Operate—Automatic—Safe
Let us tell you more about this Oil Burner.

S. T. JOHNSON CO.
1337 Mission Street  San Francisco, Cal.
Ask for Bulletin No. 28
Phone Market 2759

Member of the Oil Burners Manufacturers' Association of California

When writing to Advertisers please mention this magazine.
Pump Governors
Oil-Burner Governors
Reducing Valves
Safety Valves
Oil Valves
Blow Off Valves
Boiler Feed Water
Regulators

Oil Pumping Sets
Little Giant Improved
Oil Burners
Duplex Oil Pumps
Rotary Oil Pumps
Oil Heaters
Draft Gauges
Boiler Feed Pumps

G. E. WITT CO., Inc.
ENGINEERS
Manufacturers and Distributors
862-864 HOWARD ST. Phone Douglas 4404 SAN FRANCISCO, CAL.

ALL STEPS
Should be protected with an auto-slip safety tread.

"FERALUN" SAFETY TREADS
Pacific Materials Co., San Francisco

A. F. Edwards, Pres.
J. M. Fabbris, Vice-Pres.
J. A. Mackenzie, Secy.

Office Telephone Market 5070 Chas. F. Eisele, Asst. Mgr.
J. Rubiolo, Asst. Mgr.
D. A. Batsford, Asst. Mgr.

AMERICAN MARBLE & MOSAIC CO.
25-59 Columbia Square, San Francisco, Calif.
Near Folsom St., Bet. 6th and 7th Sts.
Factory on Water Front, South San Francisco. Phone South San Francisco 161

DETROIT STEEL PRODUCTS CO., Detroit
Direct Factory Branch, 68 Post Street, San Francisco. Phone Sutter 1250

When writing to Advertisers please mention this magazine.
THE ARCHITECT AND ENGINEER

CONTENTS FOR MAY, 1922

ENTRANCE, HOUSE OF MR. C. L. HIBBARD,
Seattle, Washington
Joseph S. Cote, Architect

Frontispiece

BIENNIAL EXHIBIT OF THE WASHINGTON CHAPTER OF
THE AMERICAN INSTITUTE OF ARCHITECTS
Carl F. Gould, President

WHAT SHALL WE DO WITH OUR CLIENTS?
Irving F. Morrow, Architect

FRAME HOUSES AND THE FIRE HAZARD
William Bayless

TILE WALL CONSTRUCTION NOT SAFE WHEN CELLS
ARE VERTICALLY PLACED
Edward Godfrey, C. E.

CONCRETE BUILDING ERECTED WITHOUT FORMS OR
Scaffolding

Construction Features of Hetch-Hetchy Dam
Howard Greenley

Pageantry and Its Relations to Architecture

Some Hints on Paint Mixing
E. O. Johnson

The Skyscraper
F. W. Fitzpatrick, Consulting Architect

EDITORIAL

WITH THE ARCHITECT

WITH THE ENGINEER

THE CONTRACTOR

Published Monthly by
THE ARCHITECT AND ENGINEER, INC.
626-27 Foxcroft Building, San Francisco

W. J. L. Kierulf, Frederick W. Jones, L. B. Penhorwood
President, Vice-President, Secretary
ON Saturday night, April first, the biennial exhibit of the Washington State Chapter of the American Institute of Architects was formally opened with a reception in the rooms of the Seattle Fine Arts Society.

The gallery presented an appearance on entering which aroused a surprised interest among the several hundred invited guests. Announcing the entrance two large plaster fauns stood as sentinels. Within, the first wing of the gallery gave the impression of a Roman atrium, the center of which was marked with a rectangular bed of planted grass, brick bordered and box-hedged, a gold mosaic bird bath in the center. At the base of the walls about the room were banked plants and cypress trees marked each pilaster division.

Above and trailing down were festoons of the greens. Upon the walls of this portion of the gallery were placed exhibits of gardens and residences. Perspectives of work executed and that proposed, as well as many photographs of gardens and residences recently completed were here hung. It was interesting to note that well-rendered perspectives in color appeared better and commanded the attention of the public more than did the actual photographs, and seemed more in harmony with the scheme of the room.

A canopied drapery, green and yellow in color, covered the ceiling through which the reduced light percolated by day, and artificial light by night, giving a fresh, springlike atmosphere to the room.

Opening in the form of an ell from the entrance gallery through an arched trellis, were the exhibits of a more institutional character in the larger space. Against the wall terminating the entrance axis was an elevated fountain, the back portion in bas relief, in front of which two graceful figures leaned forward with the tips of the fingers dipping into the pool; this by Alice Carr.

Several well presented perspective drawings of commercial buildings were shown at the far end enframed among palms which tended to soften their academic appearance. The interesting work of important
school buildings erected through the state, and private school buildings and the University of Washington, indicated the importance attached by the public to education in this northwest section of the United States.

There were several very excellent churches shown. A hydraulic power plant showing the potential importance of hydro-electric energy was dramatically presented in a drawing by the former City Architect Mr. Daniel R. Huntington. A series of drawings by the students of the department of Architecture of the University of Washington gave evidence of their ability, several of which were mentioned projects judged by the Society of Beaux Arts Architects of New York City. Student work of high schools, showing the orders, etc., was also in evidence.

HOUSE OF MR. O. W. FISHER, JR., SEATTLE
J. Lister Holmes, Architect

It was quite apparent throughout the exhibits that there is a tendency toward larger window areas in both residences and institutional work. At the same time a vertical tendency is apparent, and possibly a reversion from classic characteristics to a type suggested by late English Gothic. Especially is this noticeable among educational buildings. Nevertheless some of the most interesting exhibits shown suggested Spanish characteristics, with large plastered wall areas and flat roofs, with interesting parapet walls. Such buildings as the new ones at the Olympia Capital by Messrs. Wilder & White, and the new Seattle National Bank by Messrs Doyle & Merriam were conspicuous by their absence.

Among the out-of-town members exhibiting were Messrs. Sutton & Whitney, A. J. Russell, R. E. Borheck, Heath & Cove and Bell of Tacoma.

Mr. J S. Cote, chairman of the exhibition committee, deserves much credit for the attractive manner in which the exhibit was presented.
He was ably assisted by Messrs. J. Lister Holmes, A. F. Curtiss and Marcus B. Priteca. Credit must be given to Mr. Charles Alden for presenting an informing exhibit of farmers' residences and small houses by the Northwest Division of the Small House Bureau.


By presenting to the public their work, and offering it in a picturesque and attractive form, the architects hope thereby to create a wider interest in better building, both as to its construction and its beauty of appearance. The architect's contact with the public is difficult of attainment due to the fact that a client is a client in most cases but once. Neither is advertising in the ordinary sense a medium which he has employed to bring before the public the important service which he performs. We trust that the effort put into such an exhibition may be justified, not necessarily by any direct return in the form of work but by a more widespread public appreciation of the value of improvement in the physical condition of buildings as well as of the attractiveness of their appearance.

As Dr. Henry Suzzalo, president of the University of Washington, aptly said at the annual meeting of the Chapter:

"You architects are above all the guardians of beauty."
SKAGIT RIVER HYDRO-ELECTRIC POWER HOUSE FOR CITY OF SEATTLE, WASH.  DANIEL R. HUNTINGTON, ARCHITECT
NATIONAL BANK OF COMMERCE, SEATTLE, WASH.
DOYLE & MERRIMAN ARCHITECTS
STAIRHALL, HOUSE OF MR. CARL F. GOULD, SEATTLE WASHINGTON

BEBB & GOULD, ARCHITECTS
DINING ROOM, HOUSE OF MR. CARL F. GOULD, SEATTLE, WASHINGTON

BEBB & GOULD, ARCHITECTS
DOORWAY, VIRGINIA MASON HOSPITAL, SEATTLE WASHINGTON  BEBB & GOULD, ARCHITECTS
SOUTH PORCH PHILOSOPHY HALL, UNIVERSITY OF WASHINGTON, SEATTLE, WASH. 

BEBB & GOULD, ARCHITECTS
BETA THETA PI FRATERNITY HOUSE, UNIVERSITY OF WASHINGTON, SEATTLE, WASH., ARTHUR L. LOVELESS, ARCHITECT
HOUSE OF MR. B. A. GARBER, SEATTLE, WASH.
SCHACK, YOUNG & MYERS ARCHITECTS
TRINITY CHURCH, EVERETT, WASH.
E. T. OSBORN
ARCHITECT
HOUSE OF MR. CARL F. GOULD, SEATTLE
Bebb & Gould, Architects

FIRST FLOOR PLAN, HOUSE OF MR. CARL F. GOULD, SEATTLE
Bebb & Gould, Architects
BEDROOM. HOUSE OF MR. CARL F. GOULD, SEATTLE
Bebb & Gould, Architects

LIVING ROOM. HOUSE OF MR. CARL F. GOULD, SEATTLE.
Bebb & Gould, Architects
HOUSE OF MR. WILLIAM PIGOTT, SEATTLE
Joseph S. Cote, Architect

DRAWING ROOM, HOUSE OF MR. WILLIAM PIGOTT, SEATTLE
Joseph S. Cote, Architect
STAIRHALL, HOUSE OF MR. WILLIAM PIGOTT, SEATTLE, WASH.
Joseph S. Cote, Architect

DINING ROOM, HOUSE OF MRS. JAMES H. CALVERT, SEATTLE
Joseph S. Cote, Architect
HOUSE OF MR. JOHN W. EDDY, SEATTLE, WASH.
E. F. CHAMPIEY
ARCHITECT

Howard E. Andrews & Co., Landscape Architects.
FREMONT BRANCH, SEATTLE PUBLIC LIBRARY, SEATTLE, WASH.  
DANIEL R. HUNTINGTON  
ARCHITECT
PANTAGES THEATRE, MEMPHIS, TENN.
MARCUS B. PRITECA ARCHITECT
WHAT SHALL WE DO WITH OUR CLIENTS?
By IRVING F. MORROW, Architect.

Possibly the most neglected influence in the development of architecture is the client. It is commonly assumed that his sole function is the paying of bills; and in many cases this may be literally true. What is less distinctly realized is that even in this purely financial capacity he may be an indirect but none the less potent influence for good or evil. Yet when we reflect in how many ways his intervention may become direct and even aggressive, we begin to appreciate the far-reaching influence which he wields. The first choice a prospective builder is called upon to make is one of the largest significance. Who shall design his building? He is at liberty to select indifferently a good architect or a poor one, accountable for his choice to nothing but his intelligence or his conscience.

To the man in the street this is only as it should be. Does not the client furnish the money? and has not a man a right to what he wants for his money? If he happen to have money but lack intelligence or conscience or both, it may be a misfortune for the community; but only such a misfortune as communities have become apt in adapting themselves to through long practice, without definite expectation of redress. This attitude is a relic of the laissez faire conception of economics. I say a relic, not because that conception has been superseded, but because it at least recognizes the necessity for an aggressive defense; and anyway, most popular opinions or attitudes proceed from origins which are archaic, irrelevant, and even discredited. One of the most disheartening reflections attendant upon the achievement of any item in the program of mankind's spiritual emancipation is the practical certainty that, once accepted as just and reasonable, it will in a future age become an object of an oppressive veneration, and be cited as an obstacle to further advance.

But to get back a little closer to clients and their money—which, in the long run, must always be among the architect's chief concerns. From the point of view of pure theory the proposition that a man has a right to build what he wants with his money will not stand examination*. If practice accords him that right, it is only because practice is not fully or equally abreast of theory in all of life's relationships. Theory advances like a portly gentleman out for a leisurely Sunday stroll with the family, with all the little tykes of practical applications toddling beside and at various distances ahead and in the rear. Ordinary police powers are competent to impose certain restrictions on what a man may perform on his own property with his own money. An operation creating offensive smells may be declared a nuisance and restrained. Our noses are still more sensitively developed than our eyes; nobody who owns the land and has the money can be prevented from erecting an unsightly edifice, even on Main Street or Liberty Square. In many economic relations the "public-be-damned" attitude is a thing of the past. Nobody is required to operate a railroad or a theatre or a hospital, etc.; but anybody choosing to do one of these or a hundred other things must conform to certain well defined restrictions, designed not for his own benefit, but for that of the public with whom he comes into contact. Is it, therefore, unreasonable to urge that, in theory, a man who elects to erect a building incurs

---

*I am speaking of aesthetic values only. Of course it is accepted without question by everybody but real-estate speculators that, in so far as the safety of occupants or passers-by is concerned, it is reasonable that freedom should be limited by building laws.
an obligation to the public at large? even though we may admit that
the public temper and intelligence of the day are little likely to formulate
and impose such an obligation.

Of all artists the architect is, from the point of view of realization,
the most unfortunately situated. While it is commonly realized that a
certain degree of public appreciation must form the background for a
fruitful output, yet, within reasonable limits, (and with certain excep-
tional characters even beyond them) the painter or writer or composer
may paint or write or compose what he pleases. For the architect it is
impossible to realize his conception until he has found somebody to
finance it. This has tended to make the architect unduly subservient
to his client; many clients, on their own merits, are not entitled to such
defence. The successful practice of architecture requires a native
aptitude and a high degree of training. The deficiency of the average
layman in each of these requirements leaves him quite unqualified even
to express an intelligent opinion, let alone dictate, on the questions at
issue. If he is allowed the upper hand, not only his own building, but
possibly the larger cause of architecture, may be the sufferer. To accord
the client the right to build what he wants is tantamount to consigning
the expression of the country's spiritual life to the hands of money-grub-
bbers and speculators.**

For it must be realized that no number of trained architects, or no
degree of efficiency in training, is going to avail if people who are unqual-
ified are to possess a veto power over their conceptions. The reason that
possibly four-fifths of our architecture are mediocre or worse is not be-
cause the architectural profession is unequal to the problems before it.
Leaving out some three-fifths deliberately awarded to parties unqualified
to execute them, at least a half of the remainder, although done by com-
petent designers, is blighted by meddlesome clients.† It is not only that
large numbers of our buildings have to be erected with funds inadequate
to the purpose. Within reasonable limits that is a deficiency which
insight and ingenuity can minimize. More serious is deliberate tamper-
ing with design—the insistence on certain features or the proscription of
others, against the advice of the architect. The people who "don't know
anything about art, but know what they like" would never dream of
telling their physicians that they don't know anything about medicine,
but know what they like to take. I have known a man who sought suc-
cessive physicians until he found one in whose diagnosis he acquiesced,
but at least when an acceptable ailment was hit upon, he submitted to
his physician's treatment with due humility. Now a prospective builder
is at liberty to choose his architect in the light of his own prepossessions,
and the result of an intelligent choice should be accepted with humility.
If by inadvertence the choice prove to have been from, his point of view,
a mistaken one, he is at liberty to try another architect.††

But the most serious obstacle in the way of vital architectural de-
velopment is not a client's penchant for or against this or that style or
feature of design. These in the long run may be little more serious than
similar prejudices on the part of the architect, except in so far as they
are generally less well informed. The heaviest hand which falls on the

** Possibly this is where it belongs.
† My figures are only assumptions; in the face of accurate statistics they would probably be found
to be conservative. But I prefer not to seem too unreasonable.
†† The great obstacle to so straightforward a course is that the first architect generally insists on
payment for his services; and the average layman "can't see" paying an architect for plans he has not
built, even though he would never dream of ordering a meal from a restaurant keeper and denying
payment because he decided not to eat.
cause of architecture is that of stupid conservatism in the face of enlightened parties and policies. When the architect—who is ideally no mere scratcher of plans and elevations, but a constructor and philosopher of life in the larger sense—conceives a building embodying new or unusual, but none the less logical and beautiful, arrangements and interrelations of parts, consider the loss incurred by life and art just because one unenlightened client "can't see it"! How are we ever to develop living architecture, buildings responsive to and expressive of the best vision our civilization affords, if the people for whom we try to design them do not know how to use them and live in them? People who lead stupid lives will not tolerate intelligent surroundings. Argument is useless; are they not building their own buildings with their own money? — a right, as I said before, which society has not yet questioned.

There arises then a problem as fundamental and as serious as any occupying our best minds. It is all well and good to ask what are we going to do about the heathen in Manchuria, and the Russian debt and oil concessions in Mexico; but in the meantime, what are we going to do about our clients? A Tag Day or a Clients' Week, the recognized devices for getting ordinary domestic problems quietly and harmlessly out of the mind, would scarcely scratch the surface of the difficulty. Yet any architect who has ever known the rare inspiration of a truly receptive and, I might say, creative client, will realize the possibilities foreshadowed.

Nothing which I have said, of course, should be understood as advocating compulsion. There is no method of furthering an ideal so stupid as censorship of conflicting ideals. If the work of stupid clients can be circumvented only by according architects dictatorial powers in spite of them, then indeed is the cause for a living architecture a rather hopeless one. The prospective builder may be under a moral obligation to society, but it is an obligation which only his own intelligence and conscience can successfully enforce. Getting good architecture is a game at which two must play; it requires a client intelligent enough to desire it and recognize it when he sees it, and an architect intelligent enough to conceive it. I have already indicated my belief that the architectural profession, is by and large, equal to its job.

As to the client, if he must show equal intelligence, and must do so as a free agent, it comes down to the simple fact that he must be educated. The architect sometimes tries it. At times it works and everybody is happy; at other times he loses his client for his pains, although this may often be chargeable to faulty diplomacy. Oftenest he struggles until patience is exhausted, loses all interest, and does anything to get the job out of the way. After all, training clients, at least in any fundamental sense, should not be part of the architect's services. It is arduous, distracting, and not covered by any recompense—as a matter of fact, clients are apt to grudge payments to architects at all in exactly the proportion that they require training themselves. No, the client should come to the architect substantially trained. It is a matter of general education. How? In the schools? In the home?—I have heard discussions among educators, and I am going to stop right here. Anyway, if I insist that the architect prevail in his field, I suppose logic requires an admission of the right of the educator to do the same in his, much as it hurts to accord it. But I will say before relinquishing the floor that it is going to be a long up-hill process; and in the meantime we shall have to sit tight, grin, and bear a good deal.
WEST ELEVATION

FLOOR PLAN

RESIDENCE FOR A. GOODHUNSOX
OAKLAND CAL.

ELEVATION AND PLAN OF HOUSE IN OAKLAND
L. H. FORD
ARCHITECT
RESIDENCE FOR MRS. ALFRED COOGAN, ALAMEDA
MEYER & JOHNSON ARCHITECTS
FRAME HOUSES AND THE FIRE HAZARD

By WILLIAM BAYLESS.

FRAME construction has been the target of unjust criticism quite long enough, in the opinion of the lumber industry. As a type of construction it has been subjected to the most intemperate attack by those who sponsor substitute materials. In a country where so many frame dwellings are soon to be built it seems a matter of great consequence, therefore, that inaccurate statements or unsound deductions bearing upon this subject should not be suffered to pass unanswered.

Reports containing figures giving the number of buildings of various types together with the number of fires occurring during the year 1920 in each of the types for 83 cities (of 20,000 population and over) of the United States, have just been examined and summarized by the Technical and Research Department of the National Lumber Manufacturers Association. The first discovery was that there were only two-thirds as many fires per hundred frame buildings as there were fires per hundred buildings of other types, although frame buildings outnumbered all other types of buildings more than three to one.

There were sixteen fires per thousand frame buildings and in buildings of other types there were twenty-five fires per thousand buildings. It has been stated over and over again that frame buildings with shingle roofs were the principal cause of communicated fires and that communicated fires represented the major percent of annual fires and fire losses in this country. Yet in 83 of our cities (in the year 1920)
98.7 per cent of all fires were confined to the building or place in which they originated. Communicated or exposure fires were reported as including some fires that did not have their origin in building fires. The communicated fires represented 1.3 per cent of the total number of fires, and only one-fifth of one per cent of the total number of fires extended beyond the buildings immediately adjoining the places of origin. The loss from communicated fires was 7.34% of the total loss. No figures are available for the number of fires communicated to or from frame buildings but it is well known that the majority of exposure fires occur in business and mercantile districts where frame construction does not predominate. And then, even if all exposure fires were from frame building to frame building, they would represent only 2.8 per cent of the frame building fires. Our greatest losses occur in those districts where other types of construction prevail.

In presenting these figures the Technical and Research Department of the National Lumber Manufacturers Association wishes to emphasize the fact that the information is not presented for the purpose of creating an impression that frame construction is superior to all other types for all purposes. It does wish to show, however, and to show conclusively, that for the uses to which frame construction is now commonly put, it is the best form of construction. That is use wood where wood is best.

At the present time, however, even with the ratio of fires in frame buildings so much less than in other types, there are cases where frame construction is used for purposes for which it is totally unsuited—where, for instance, it accommodates occupancies that are serious fire hazards. But even under such conditions it has been more generally satisfactory than other types of buildings.

The methods of constructing supposedly fire-proof buildings have been constantly improved. It is true that the hazard of occupancies has become greater at the same time (though not at the same rate as improvements in methods have taken place). In the face of all this, the per capita fire loss has not been reduced. In fact it has steadily increased.

As far as reduction of losses is concerned the facts herein set forth clearly indicate that it is useless to replace wood where it is now used, with other materials. Attention should rather be given to ways of providing for the very hazardous occupancies and the carelessness of occupants. Attention to these matters will go further to reduce the great annual fire loss than all the efforts of those who are making such a strenuous attempt to replace wood with their pet materials.

Looking back over the years the degree of carelessness of the occupants of buildings seems to have increased in proportion to the added degree of fire protection. A residence built of materials that will not readily burn increases the occupant's negligence and general carelessness. In this connection, the opinion of one whose daily contact with the fire problem in a mid-western city should be interesting. Daniel F. Shire, Chief of the Fire Department at the Rock Island Arsenal, Rock Island, Ill., in a statement which appeared in the March, 1922, issue of “Fire and Water Engineering” said:

“The only persons who can prevent loss by fire are the owners and occupants of the premises—upon them rests the responsibility of loss in nearly every fire.”
The high esteem in which wood as a building material is held by those who have a thorough knowledge of the conditions, is shown in another statement by Mr. Shire in the same magazine. He says: "Fire-proof construction means nothing to you if it is not safe construction. I would rather go up against good safe mill construction than the so-called fire-proof building any time, and so would you."

The following summary based on figures appearing in the 1921 report of the Committee on Statistics and Origin of Fires of the National Board of Fire Underwriters, should be of interest to all those who have been bombarded with literature and other forms of propaganda, emanating from interests whose sole object seems to be to discredit frame construction:

Summary of Report.

<table>
<thead>
<tr>
<th>Type of Building</th>
<th>Number of each type in cities</th>
<th>Number of fires in each type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reinforced Concrete</td>
<td>2589</td>
<td>163</td>
</tr>
<tr>
<td>Fire Proof (Steel Frame)</td>
<td>3421</td>
<td>92</td>
</tr>
<tr>
<td>Brick and Stone</td>
<td>283432</td>
<td>6877</td>
</tr>
<tr>
<td>Iron-Clad</td>
<td>2809</td>
<td>136</td>
</tr>
<tr>
<td>FRAME</td>
<td>944494</td>
<td>15637</td>
</tr>
<tr>
<td>Concrete Block</td>
<td>5305</td>
<td>148</td>
</tr>
<tr>
<td>Buildings not classified</td>
<td>12112</td>
<td>336</td>
</tr>
</tbody>
</table>

Total Buildings                  | 1254192                       | Total Bldg. Fires             |
Total Other than Bldg. Fires      | 11108                         |                              |
Total Fires                       | 34497                         |                              |

75.3% of all buildings were frame.
1.65 fires per 100 frame Buildings.
2.43 fires per 100 brick and stone Buildings.
250 fires per 100 of all buildings other than frame.
330 fires extended to the adjoining building only.
70 fires extended beyond the adjoining building.
1.1% of all fires extended to the adjoining building.
.2% or 1/5 of 1% of all fires extended beyond the adjoining building.
98.7% of all fires were confined to the building or place or origin.
Ratio of frame buildings to brick and stone buildings 3.33 to 1.
Ratio of frame buildings to all buildings other than frame 3.27 to 1.
Total loss to buildings and contents..................................................$23,707,411
Loss caused by communicated fires—7.34 per cent of total............$1,741,108

NOTE.—Communicated fires include some fires that did not originate in buildings.
TILE WALL CONSTRUCTION NOT SAFE WHEN CELLS ARE VERTICALLY PLACED
By EDWARD GODFREY, C. E.

In your March issue Mr. Ross Wilton Edminson gives an account of the Knickerbocker Theater failure. Unfortunately, for your reader's information, the one great fault, or combination of faults, with the construction of that theater, and the one that is without doubt the sole cause of the disaster, was not mentioned.

I refer to the support of Main Truss T11, as shown in Mr. Edminson's plan in your March issue. This truss was supported on a wall having an inner shell of tile built with the cells vertical and an outer shell of brick. Ten years ago I called public attention to the error of this type of building walls carrying loads. It is faulty in two ways, as described in the following two paragraphs:

First, a tile wall cannot be commercially built strong when the cells are placed vertical. The reason is that there is no surface to receive the mortar for a horizontal joint. No tile layer is going to putter around laying mortar on the thin ribs of a tile. In any event these ribs may not "register" in two tiles placed one above the other. The workman will put on just enough mortar to steady the tile and furnish a joint on the face of the wall. If a close steel mesh were laid in each hori-
zontal joint, a good joint could be effected, but this is laboratory stuff.

Second, a combination of a yielding shell, such as the tile backing in a wall, and a rigid shell, such as the brick facing, does not make a proper wall for support of loads. Many cases of this have come under my observation. Some of the combinations are: Face brick with thin joints and common absorbent brick with thick joints (shrinkage in the thick mortar joints); cast or cut stone facing with thin joints and concrete or rubble stone backing; brick facing and tile backing. The improper character of the walls has manifested itself in bulging and in spalling or cracking of the outer shell, and in one case disastrous failure of the reinforced concrete construction supported by the piers and walls.

In the Knickerbocker Theater Main Truss T11 was supported on a wall (the Columbia Road curved wall) composed of an outer shell of unyielding brick and an inner shell of yielding tile, laid with the cells vertical. There is no doubt that this inner shell yielded enough to give the truss support a slope. This truss had only to work off laterally in order to become unseated, for there were no anchor bolts into the wall, and there was no connection of steel work near the end of the truss, as will be seen by reference to the plan.

Any jarring, as of street car traffic, and any expansion and contraction would help to move this truss off its sloping seat. The lateral motion would not crack the ceiling, for the ceiling was not attached to this truss. When the last jar occurred and the truss slipped off the wall, the great weight gave the wall a final shove, causing the cracks at the corners and the outward leaning of the wall.

There were no doubt other weak features in the design and construction, but weakness that causes such utter ruin must be more deep seated than merely relative weakness.

“TOO LATE,” THE SADDEST WORDS IN CITY BUILDING

A prominent real estate operator of Kansas City recently made the following timely utterance:

“The words “too late” are the saddest words in city building. Particularly in our small cities, of a hundred thousand to two hundred thousand, it is not too late to correct many of the abuses of the past. When you erect a light office building do you realize that the intensive use of automobiles today regulates the height of your building, or do you go ahead and build it as high as you can under the ordinance of your city? Do you realize that values are going to be rendered unstable in our cities if we continue to crowd buildings on the down-town streets making business conditions impossible? The automobile always selects a through street. It selects well paved streets, thereby increasing the expense on certain highways.

“It is in the haste of things that we plan only for today in our cities and forget the needs of tomorrow. For example, in Oakland they have been working on a plan for years of a municipal railway, and there had come up the matter of location of a large private shipbuilding plant that would block forever that city accomplishment, yet it was just as possible to place this plant at another point and not interfere with this municipal railway. It is the things done without thinking of tomorrow that injure our cities in the future.
CONCRETE BUILDING ERECTED WITHOUT FORMS OR SCAFFOLDING

The erection of a concrete building in a single afternoon by means of giant screw jacks that raise a solid wall at one time is accomplished through a scientific system of construction invented by Col. Robert H. Aiken of Washington, D. C., and executed by Messrs. Snowden Ashford and Carroll Beale of the same city. The work is completed without the use of forms and scaffolding, and without "pouring" the concrete in the customary way. This is how it is done, as explained in the March issue of Popular Science Monthly:

The basement floor is laid in the usual manner and finished smooth to a level. The hoisting-jacks and trusslike girders are aligned in front of this floor, and upon the girders loose planks are laid transversely, until a platform the size of a side wall has been built. All the windows and door frames are laid on the platform, and concrete is poured around them.

At the same time all the details of the completed wall are cast in place, either by nailing an insert or print-block to the platform, or by carving a design into it, according to whether the ornament is to project from the wall or not. The four walls of a concrete house of ordinary size can be molded in about two hours. The concrete on the platform for each wall is then allowed to set for three days, until it becomes thoroughly dry and hard.

Next comes the hoisting of the walls. By means of a common driving-shaft, all the jacks are connected with a low-power gasoline engine, and as this is started the platform and wall, pivoting on one edge, rise slowly into place without any risk of breaking during the ascent or of rising past the vertical and falling in the other direction. Such mishaps are made impossible by the careful designing of the jacks and guides.

Once erected, the walls are united at the corners by casting pillars of concrete at the joints.

With this method it is possible to raise an entire factory in a day, or to build an entire row of houses at one time. In the latter case, three or more fronts are raised one after another during one working day, with one crew using the same equipment.

APARTMENT HOUSES BEING EQUIPPED WITH RADIO PHONES

Several of the large real estate companies in New York report that so many requests have been received from tenants desiring to erect aerials that they are planning to wire a number of the larger houses along Park street and Fifth avenue and equip them with radio telephone service. It will be much less expensive and far more satisfactory to have one large aerial for the house than to have a number constructed by individual tenants.

The demand seems to be strongest where there are children, especially those of the high school age. Radio instructions are being given in all schools and undoubtedly wireless phones will become a household convenience in the near future.

Philadelphia also includes wireless equipment in its specifications for a number of new apartment buildings now under construction, and in San Francisco and Los Angeles, several architects are reported to have made provision for radio equipment in new buildings in course of study. In Piedmont the new High school, designed by Architect W. H. Weeks, is to have one of the most complete radio plants on the Coast.
CONSTRUCTION FEATURES OF HETCH HETCHY DAM

CONSTRUCTION is now well advanced on the Hetch Hetchy dam of the new water supply development of San Francisco.

The dam is to be of the gravity type, arched in plan, with the radius of the up-stream face at the crest 700 ft. The principal dimensions are as follows:

<table>
<thead>
<tr>
<th></th>
<th>Initial.</th>
<th>Ultimate.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total length on crest, in feet</td>
<td>600</td>
<td>900</td>
</tr>
<tr>
<td>Height of crest above stream level, in feet</td>
<td>226</td>
<td>312</td>
</tr>
<tr>
<td>Depth from stream level to bed-rock, at toe of dam, maximum, in feet</td>
<td>101</td>
<td>101</td>
</tr>
<tr>
<td>Total height of dam, above bed-rock, in feet</td>
<td>327</td>
<td>413</td>
</tr>
<tr>
<td>Width at top, in feet</td>
<td>15</td>
<td>25</td>
</tr>
<tr>
<td>Width at base, maximum, in feet</td>
<td>298</td>
<td>298</td>
</tr>
<tr>
<td>Volume of masonry, in cu. yd.</td>
<td>375,000</td>
<td>660,000</td>
</tr>
</tbody>
</table>

Most of the dam will be of 1:3:6 concrete embedded with large stones. For the concrete against the foundation, the cut-off trench, the up-stream face, and the down-stream face in the spillway section, a 1:2½:5 mixture is to be used to give greater impermeability.

The limiting working stresses in the design were as follows:

<table>
<thead>
<tr>
<th></th>
<th>Tons per sq. ft.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pressure normal to joint, up-stream toe:</td>
<td>25</td>
</tr>
<tr>
<td>Reservoir empty</td>
<td></td>
</tr>
<tr>
<td>Reservoir full</td>
<td>16</td>
</tr>
<tr>
<td>Maximum pressure in section, under worst combination of conditions and lasting for comparatively short periods of time</td>
<td>27.5</td>
</tr>
</tbody>
</table>

No tension was permitted in the concrete. On each joint, upward water pressure was considered as acting at the up-stream face with an intensity of two-thirds the total hydrostatic head and diminishing uniformly to zero at the down-stream face. On the foundation joint, an upward pressure of two-thirds the hydrostatic head due to the back-water was also considered.

The dam is to be penetrated by a system of inspection tunnels, inspection wells, and drainage wells. The inspection wells will be lined with dense concrete blocks and equipped with ladders. The drainage wells will be in porous concrete blocks and will be 15 in. square.

Radial contraction joints, sealed by bent copper waterstops, are provided at intervals of about 100 ft., measured along the up-stream face. Each contraction joint bisects an inspection well. The crest of the dam will be used as a roadway, in both the initial and ultimate developments.

The ultimate dam will have a spillway of the weir type, with a channel to carry the waste water around one end of the dam. A siphon spillway has been adopted for the initial dam, and will be in eighteen sections, staggered in elevation to obviate vacuum effects, with a total length of clear openings of 180 ft. 6 in. Each section will be 8 ft. high at the entrance, tapering to 4 ft. at the crest of the siphon, and will have two air vents, each 12 by 24 in.

There will be twelve outlet conduits, six of which will be each 5 ft. in diameter, and arranged in pairs at three levels. These will discharge water (in quantities up to 3,000 sec.-ft.) which under certain conditions of river flow is to be permitted to pass the dam for the use of irrigation districts in the lower reaches of the Tuolumne River. Each of the other six outlets will be 3 f. 6 in. in diameter, in two groups of three, and will discharge the water for the city supply. The smaller outlets will ultimately discharge directly into the aqueduct tunnel to be constructed in

*Old Mission Portland Cement used on this project.
connection with the future power development at Early Intake, whereas the water for irrigation may flow directly down the bed of the river.

The discharge in each conduit will be regulated by balanced needle-valves with the Larner-Johnson type of control. At the entrance to the conduit there will be a slide-gate with hydraulic cylinder operation. A heavy reinforced concrete shutter may be lowered through a slot in the wall of the outlet structure to close the opening on the up-stream side of the slide-gate, thus providing access to the gate for inspection or repairs.

The maximum measured flood flow of the Tuolumne River at the dam site, during the ten years for which records are available, was 12,700 sec.-ft., and the stream-control works were planned for approximately that quantity of water.
The river is by-passed around the dam site through a tunnel 23 ft. high, 25 ft. wide and 900 ft. long. The lower group of three 3 ft. 6 in. outlet conduits will be placed later in this tunnel.

The diversion dam is a rock-filled crib 321 ft. long, of 12 by 12 in. timbers. The up-stream face is sheathed with a double layer of 2 in. plank, with a layer of tarred burlap between. A maximum head of 13 ft. over the top of the tunnel was provided to dispose of the flood waters.

A concrete dam was built just up-stream from the lower portal of the diversion tunnel, to prevent water discharged through the tunnel from backing up into the dam site. This dam was founded on boulders and course gravel, and is 51 ft. long on top. Its foundation was grouted to secure water-tightness.
The contract for the construction of the initial development of the Hetch Hetchy dam was awarded on Aug. 1, 1919, to the Utah Construction Co., at a total estimated price of $5,447,972. The principal items were:

<table>
<thead>
<tr>
<th>Excavation in dam foundation: in cu. yds.</th>
<th>Below original stream bed</th>
<th>Above original stream bed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Earth and loose rock.......................... 65,000</td>
<td>$ 8.00</td>
<td>$ 1.50</td>
</tr>
<tr>
<td>Solid rock .................................... 100,000</td>
<td>11.20</td>
<td>3.00</td>
</tr>
<tr>
<td>Cyclopean masonry, 1:3:6; concrete with at least 10% of plumbs... 300,000</td>
<td>11.80</td>
<td>11.00</td>
</tr>
<tr>
<td>Mass concrete, 1:2½:5.......................... 75,000</td>
<td>15.00</td>
<td>14.30</td>
</tr>
</tbody>
</table>

A steam shovel was used for the greater part of the excavation in the dam site, loading directly into dump cars. When the space became too cramped to permit steam shovel operation, the final 20,000 yds. were
loaded into the skips by hand. The skips were emptied into trains running on trestles along the north and south walls of the gorge.

Excavation on the sidewalls and in the cutoff trench above the stream bed level was carried on by drilling with jack-hammers and shooting and barring down the material to the river bed, where it was loaded into trains of narrow gauge 4-yd. side-dump cars by a Marion No. 36 steam shovel on crawler treads. The trains were hauled by 18-ton saddle-tank locomotives to a waste bank near the crusher plant and the excavated material was dumped there, where it can be readily re-excavated to be screened and crushed for concrete aggregation.

On reaching the river bed level the steam shovel was used in excavating the foundation pit for a depth of 65 ft. to elevation 3,435. In the lower part of the steam shovel excavation, the trains operated on
a very steep incline, with a maximum grade of 20 per cent. The trains were worked on a counter-balanced system, the empty train entering the pit helping the loaded train up the steep grade.

The total excavation for foundations was 165,000 cu. yd., of which 100,000 cu. yd. was solid rock. The trains dumped the material on the floor of the valley and much of the dumped rock will be used for concrete aggregate. Large rock fragments and boulders were placed by derricks on convenient corners and ledges for storage until required for plumbs in the cyclopean masonry. The lowest point in the foundation is 118 ft. below the original stream bed.

Nearly all the surface rock in the foundation above the stream level was removed, leaving a newly broken granite surface to receive the concrete, but below that level, where the rock had not been exposed to weathering, the trimming covers a much smaller proportion of the whole surface. The underlying formation is very tight. The foundation below the former stream level is being prepared to receive the concrete, largely by sand blasting, which removes scale and soft pits satisfactorily and roughens the polished surfaces. Loose sand and dust are removed by washing and brushing with wire brushes.

Excavation to bed-rock was completed in August, 1921, and immediately afterward the pouring of the concrete was commenced. The dam is expected to be completed by March 1, 1922.

To handle the material from the deep excavation, one steel derrick with 100 ft. boom, one with 110 ft. boom, one wooden guy derrick with 70 ft. boom and one with 60 ft. boom were used overlapping to cover all points in the lower portion of the dam. In connection with the derricks a high railroad line was built on the south abutment at elevation 3,540, connecting with the valley railroad system by crossing on the diversion dam, and a railroad track was placed at the same elevation on the north abutment. Dumping platforms were arranged on these railroads, enabling the derricks to unload 3-yard skips directly into the dump cars. The derricks are now used in connection with the concrete work, to handle loaded skips of plumb rock from the flat cars to the cyclopean masonry without interfering with the pouring operations.

A 15-ton Lidgerwood cableway with a span of 903 ft. of 2 1/4 in. cable, supported on towers 528 ft. above the bottom of the foundation pit, and having a speed of 900 ft. per minute, is in use. The cableway is so placed as to permit handling the 5-ft. balanced valves on the face of the dam and the three-foot valves down the shaft to the diversion tunnel.

Machinery, industrial locomotives and other heavy equipment, lumber and timbers, etc., are handled by this cableway from cars standing on the track of the Hetch Hetchy R. R. to the narrow-gauge cars of the contractor's industrial railroad on the valley floor level. The drop from one track to the other is over 300 feet.

Employees quartered at the main camp are lowered to and raised from the work in a skip suspended from the cableway. It requires but four minutes time to transport 55 men from the foundation pit to the camp level.

A narrow-gauge valley railroad was built to haul the excavated material from the dam foundation to the dump in the valley, to bring sand and rock from natural deposits and from the dump and quarries to the crusher plant for washing, screening and crushing, and to haul the crushed rock and clean sand to the concrete mixing plant at the dam.
A rock crushing plant to produce aggregate for concrete has been erected on the valley floor. The material, ranging from sand up to boulders and rock fragments about 1 cu. ft. in volume, is brought to the plant in trains of 4-yd dump cars. It is passed over a grizzly with bars spaced six inches apart. The rock which does not fall through the grizzly is crushed by a 26 in. by 42 in. primary jaw crushe r.

From this crusher a 30-in. belt conveyor carries the crusher-run rock and the material that passes through the grizzly to a ¼ in. mesh revolving screen. The fine material or sand passing through this screen goes to a log washer, and the coarser material is run through a 2½ in. revolving screen, the rejects continuing to a No. 6 McCully gyratory crusher and a No. 49 gearless, belt driven Kennedy-Van Saun crusher, set for producing 2-in. rock. The re-crushed rock is carried to a revolving ¼ in. manganese steel screen into which jets of water under high pressure are sprayed, separating all crusher dust and diverting it to the sand washer.

After the final crushing of the rock and washing of the sand, these materials are elevated on belt conveyors to a trestle 38 ft. high and discharged into storage piles, one for rock and one for sand, under which are two trap tunnels with mining dump doors, spaced 14 ft. on centers. This storage has a capacity of 8,000 cu. yd. of sand and crushed rock. From the storage piles 4-yd. side dump cars are loaded with aggregates by gravity, the spacing of the trap doors permitting all the cars of a train to be loaded without moving the train.

The concrete mixing plant, with a capacity of 100 cu. yd. per hour, is located near the up-stream face of the dam on the south abutment, at 3,540 elevation, 158 feet above the lowest point in the foundation pit and 187 ft. below the crest of the dam.

This plant consists of two 2-yd motor-driven Ransome mixers, with a charging bin of 300 cu. yd. capacity elevated above the mixers. The sand and rock brought in the dinky trains from the crusher plant are dumped into small receiving bins and elevated by motor-driven belt conveyors to the charging bin. Immediately below the charging bin are measuring bins, with a fixed choke feed and inlet gates operated by hydraulic cylinders. The gates from the measuring bins are also operated by hydraulic cylinders, the mixer man manipulating a 3-way valve to move both gates. Adjacent to the receiving hoppers of the mixers are the cement measuring bins, which are filled from the weigher house, 180 ft. above, through two 8-in. riveted steel pipes. Water for the mixers is pumped from the river into a 10,000 gal. tank on the adjacent hillside and the quantity for each charge measured in a steel drum mounted on the mixer.

The spouting system is used for placing concrete. A four-compartment elevating tower, 10 ft. by 27 ft. in horizontal dimensions, and 150 ft. high, has been built of Oregon pine timber. Each compartment is equipped with a self-dumping 1-yd. steel skip. The skips are operated independently by single drum hoists driven by 75 h. p. motors and are capable of a speed of 300 ft. per minute. The tower is designed to have an ultimate height of 340 ft. It is built up of four 10 in. by 12 in. and four 10 in. by 10 in. timbers, thoroughly sway-braced, and guyed with ¾ in. cables at every 40 ft. of its height. The concrete will be distributed from the tower through two lines of 15-in. Insley chutes, with 50-ft. counter-balance sections.
All cement, except the relatively small quantity required for concrete blocks and miscellaneous small jobs, is delivered to the job in bulk. The box cars in which the cement is brought to the dam site over the Hetch Hetchy R. R. are emptied by means of an unloader consisting of a small motor driven winch which drags a flat board scraper. The cement falls from the car doorway into a hopper, from which a 12 in. screw conveyor takes it to a storage bin 150 ft. away, which bin is 60 ft. long, 32 ft. wide and 34 ft. deep, built with a V-shaped bottom, making the entire 13,000 bbl. capacity (about 60 carloads) live storage. From the bin a 12-in. screw conveyor 120 ft. in length carries the cement to a weigher house. This conveyor runs through a 4 ft. by 6 ft. tunnel beneath the storage bin. Slide trap doors are arranged along the sides of the tunnel to release the cement from the bin.

The weigher house is equipped with two 1,200 lb. capacity scales with automatic feed and cutoff arrangements. Electrically operated signals, consisting of flash lights and horn sounders, and an independent telephone line provide means of communication between the weigher house and the mixer house 180 ft. below. Two 8-in. steel pipes on a 1-to-1 slope carry the cement from the weigher house to the cement measuring bins near the mixers. The Hetch Hetchy Water Supply Department is being carried out under the direction of an engineering staff of which Mr. M. M. O'Shaughnessy, city engineer of San Francisco, is chief engineer, and N. A. Eckert is project engineer.

The foregoing article was prepared from a paper, “Construction Progress of Hetch Hetchy Water Supply,” by Mr. O'Shaughnessy, in the February Proceedings of the American Society of Civil Engineers, and from the annual report of the Bureau of Engineering of the Department of Public Works of the city and county of San Francisco, from Engineering and Contracting and from revisions by Mr. L. W. Stockes, assistant to Mr. O'Shaughnessy.

POMPEII CRAFT PRODUCED FINE ADAMS TYPE

From a study of Pompeii, which was made by Robert Adam during a tour of Italy made in 1754, is due the revival of interest in classic design brought about by him and by his brother, James Adam. Unlike other furniture designers of the Georgian period, the brothers Adam were architects and decorators, not cabinet makers, and it was through their architectural developments that the interest was evolved which gave to them a very definite place in the development of furniture design in England.

In the furniture which they designed to fit their houses rococo, Dutch and Chinese elements were completely abandoned. The cabriole leg was superseded by the straight, tapering leg, and lighter construction became the rule.

Carving when used was in low relief, and was rich in inlay of tulipwood, satinwood and ebony. Carving and inlay were in classic details—the urn, the laurel wreath, the oval sunburst, the acanthus leaf arabesques, ribbon bands, festoons and garlands. Painted decoration was utilized by them.
PAGEANTRY AND ITS RELATION TO ARCHITECTURE
By HOWARD GREENLEY

Presented to the New York Alumni of the University of Pennsylvania.

I HAVE always maintained the existence of a practical relationship between Architecture and the art of the theater in which pageantry must be included. If, in the opinion of the cognoscenti the productions of the architect may be considerably referred to as architecture we can then hopefully assume on my hypothesis that the architect is qualified to effect an easy transition into the realm of the theater and to develop his contact with pageantry, and, I further maintain, to the infinite advantage of both.

We are, therefore, gentlemen, attempting to develop the theme of the relation of one great art to another equally great art. If the definition of unity can be applied as a term in the final resolution of all the arts, then the relationship is at least theoretically established. Perhaps to establish this relationship of Pageantry to Architecture by indirection, I might say that Pageantry is directly what Architecture ought to be and too frequently, alas, is not, the art of self expression. And this is one of the great dangers associated with the profession of architecture that so many fall into; its conception merely as a study of archaeology translated into terms of expediency and with the harassing accompaniment of an eternal routine of difficulties to be resolved or of compromises to be anticipated.

I am consciously drawing the worst side of the picture so as to stimulate you to a revolt against a situation which some of you have experienced, and to prevent, if possible, others of you from experiencing by suggesting various alternatives of self expression as a remedy against discouragement.

For as Maeterlinck says in one of his plays—‘I think it is “Aglavaine and Selysette”’: “By dint of concealing that which is best in you from others you will end by not recognizing it yourself.”

Nothing that I know of contains a greater degree of truth than this observation and this is the theme which I want to discuss and develop as the remedy which I have referred to. You may wonder how I shall ultimately get away with it when I describe this remedy as being nothing more nor less than pageantry. Pageantry viewed in its broadest sense.

We have referred to pageantry as an art of self expression. Let us see if it be taken periodically in accordance with the capacity of the individual who accepts it as a remedy, whether it is practical in the sense of a mode of self expression. Will it furnish an outlet for that which is best in you; for all those stored up creative energies which are not only going to bring satisfaction and efficiency to you in your work but also a corresponding measure of joy and satisfaction within the larger circle of the community? Of course, what I have said is predicated on your inclination to do a day’s work. There is little advantage to be gained in talking to anyone who doesn’t regard it as a heaven sent opportunity or to the class who consider it vulgar. Let us proceed on the supposition that we do not belong to these classes and continue. It is a fact that all of you will average seven hours of leisure daily over and above office, meal and sleeping hours. Potentially there is a lot of energy going to waste in those seven hours if you do not use some of them creatively and constructively. For many of you, a part of the time is devoted to golf or riding or swimming, or dancing as the case may be—
excellent and essential activities to whatever extent indulged in, but super-
relatively valuable if you undertake them with mind and muscle consci-
ously co-ordinated toward the attainment of perfect style and form and
rhythmical action. Now put a little of this same effort and resultant
style into your work and see what happens as a result. More quality,
more speed and more time at your disposal.

What I am getting at is this; the greater and more varied your ac-
tivities, the more you can do, and the more opportunity you will have
to exercise your creative faculties along varied lines of self expression.
Some of the spare time you have unscheduled you can use to advantage
in discovering the latent talents and aspirations within yourselves and
developing them. That they will be along lines of artistic endeavor is
more than probable in view of the training and education you have been
privileged to receive.

Art has been described as the quality of being able to express an emo-
tion beautifully. Now if we get to the point of applying this principle
to as many of our activities as we can we become after awhile able to
inject beauty into our own lives and into the lives of others as well. We
become all of us potential figures in the pageant of the world's progress.
It makes no difference what we are doing, so long as we do it well and
understandingly, for without that understanding, we are little better
than slaves. Now all of this is preparatory to this subject of pageantry
and its architectural relation. If art is the quality in the individual of
being able to express an emotion beautifully, pageantry is nothing more,
nor less, than a collective expression of the same thing. The word
pageant comes from a late Latin word "pagina" meaning a stage, and
pageantry is described as a spectacle, or a kind of continuous perform-
ance.

Since Shakespere has said that all the world's a stage, he had a fairly
clear notion of pageantry. In the largest sense it is the theater of life, and
the theater is an all comprehensive art. It has by assimilating the inner
rhythms of many arts into the service of a new structure created new
beauty.

The applicability of the definition to architecture must be apparent
to you, and further examination will develop additional conformity. The
same elements enter into the structure of a stage production, or of a
pageant as in an architectural construction. Both must proceed with
a plan, call it a scenario or a program as you like; the plan must be de-

erived from it.

You have the periods of history covered by the Pageant parallel in
the historic style of your architectural design. The stage settings, em-
bellishments, accessories and properties required in the presentation of
a pageant, correspond to the decoration, the furnishings and other equip-
ment of a building, and furthermore are all architectural in source of
design. Again the composition of your pageant groups and the design
and color of the costumes are all reflected in the composition, ornamenta-
tion and color treatment of your building.

But you may accept this and still say that after all, architecture is
static as compared with the rhythmic movement and kaleidoscopic color
changes in your pageant. What then? Let me ask if you have ob-
erved what the life of the majority of buildings is in New York. Due
to changing conditions of zoning, trade centers, occupancy or of many
other demands one can say that twenty years is a fair average. Is there
not something of a passing spectacle or a fleeting show about this com-
parable to pageantry? But let us disregard this impermanency and look at it from another angle. Is there nothing rhythmic about a tremendous colonnade in the orderly spacing and dimensions of its columns and the swing and sweep of its soaring mass. Have none of you observed the color changes in a building under various conditions of light or of darkness or of other atmospheric effects? Of course you have, but you may never have been impressed by its relation to pageantry. A magnificent building is not only the background of a pageant; in itself it represents the pageant of architecture. Look at it not merely as a mass of stone and steel, but visualize it as living and filled with color. Observe the dramatic dominance of its scale, and then you get within your imagination something of the relation between these two expressions of pageantry and architecture, and something of its emotional appeal.

And no other group of men in the world today is so singularly well equipped as you architects. You are trained in all of the things which the art of the theater in the larger sense of pageantry implies. You have the knowledge of design, of composition and of color. You are susceptible to qualify of rhythm whether expressed musically or in the orderly sequence of architectural plan and elevation. You bring to bear on the subject resourcefulness, ingenuity and a systematic procedure into the working out of a project from its inception to its completion and in my own experience, gentlemen, I have found this my most valuable asset as compared with others outside of our profession who are engaged in this kind of work. And last but most important, you have the knowledge of suitability and of taste and of scale and there is where you are triumphant.

Now I do not tell you to all go out and become masters of pageantry or of decoration, but I do say this; that if there is anything I have told you that makes an appeal to your imagination go to it. Put in some of your spare hours thinking about these things. Put some of them in practice on any scale you may select. It is not necessarily a question of dimension. Spread the information. Carry the torch. You have had the advantage of education that many others have not enjoyed. Watch them absorb it. No other factor in the lives of individuals is as psychologically profound.

Grace of mind and of body go together and the desire for better things. And I have the firm conviction that any community or group of individuals which has watched or participated in pageantry production must react in a very definite way to the appeal to its beauty and formulate a creative desire to make its own surroundings approach the ideals which have been set before it in the pageant.—Pencil Points.

A DESIRABLE COLOR SCHEME FOR HOSPITALS

In one of its recent issues The Modern Hospital, replying to the query of an architect, states that the most desirable color scheme for walls and ceilings in a hospital appears to be a cream or buff shade or light green. In localities where there are many dark or rainy days, the light buff or cream for walls and ceilings is the most generally used.

HOME OUR BEST SECURITY FOR CIVILIZATION

The English statesman, Disraeli, said:

"I have always felt that the best security for civilization is in the dwelling; and that upon properly appointed and becoming dwellings depends more than anything else the improvement of mankind."
SOME HINTS ON PAINT MIXING
By E. O. JOHNSON, National Lead Co.

A FEW weeks ago, while in one of lower Broadway’s finest office buildings, some redecorating was going on in the big foyer and I stopped to chat with one of the men on the job.

As I stood there, my painter acquaintance removed the lid from a can of paint and started to stir.

“What are you doing?” I asked in amazement. “Can you mix up that paint that way?”

“Why, that’s the way I always do,” was the indifferent reply.

A week later, when I talked with the superintendent of the building, he pointed out to me the shiny spots here and there on that wall and I told him how the paint had been stirred up. The superintendent knew a good deal about painting himself and I didn’t have to tell him that the oil should have been poured off and mixed a little at a time into the paint which had settled; “boxing” the paint from one receptacle to the other and using every precaution to get a uniform and homogeneous mixture of paint and oil.

SHOULD HAVE BEEN THINNED

Not long after the incident just related, I stood watching a workman mixing paint for the window sashes of the new Cunard building a little further down the street. He had some light green paint and he had to match it to a darker green. He took a can of paste lampblack and dumped it in and began to stir. He pulled his paddle out of the paint and looked at it. The paint on it didn’t show much change, so in went some more lampblack. Still the same result. The painter didn’t stop to think that the black was lighter in weight than the green and so stayed at the top of the mixture, adding little depth to the tone—also probably in comparatively large particles.

Straining the paint would probably have mixed the color in, but it would have left it a different shade than the painter figured on. If he had thinned his color with some turps before putting it on the paints, the black would have mixed in and straining it would not have changed the shade from that desired.

Now these two instances may seem surprising, because painters are supposed to know how to mix paint as well as apply it. Some of them do. Some of them, however, do not even know how to properly stir up a prepared paint. I think that if I were a building superintendent or a boss painter, I’d give every painter in my employ a little course of lessons to be sure he understood the fundamentals.

TRICKS TO ALL TRADES

There are “tricks of the trade” for mixed paint and others for thinning paste to painting consistency.

Keg white-lead is a fairly heavy paste and the first thing that must be done therefore is to thin it with more of the pure linseed oil which has already been used to transform it from a powder to a paste.

Let us suppose that we have a hundred pounds of white-lead and we want to add to it two gallons of oil and two gallons of turpentine. If we should mix the oil and turpentine and then put the entire hundred pounds of paste in and try to stir it up in that quantity we would find that the paste would probably remain in lumps; stir as we would, it would not mix properly with the liquid.

Consequently, as every painter knows, we first pour into a receptacle a very little of the oil and then put in the paste white-lead. With a
strong wooden paddle stir and mix, thus working the paste lead and the oil together. A small quantity of oil added in this way softens the paste somewhat and when it has been thoroughly mixed and made uniform throughout we add a little more oil and stir again. We keep on adding oil a little at a time until the paste is sufficiently fluid to be easily stirred, but still is like a thin paste similar to colors in oil and not thin like a paint ready for application.

**COLOR TINTS**

If any tinting color is to be added, thin the tinting color to about the same consistency as the semi-paste described above by adding oil or turpentine as required and adding to the white-lead a little at a time, stirring each application in thoroughly. Different makes of colors differ in tinting strength, and if we were to add all the color at one time we might get our mixture too deep. It is far better to add a little at a time, bringing it up to the color gradually. If this is done a perfect match is not difficult. A good scheme is to dip out from the white mass a small quantity before adding the colors to be used to lighten the tint in case to much color has been added. This will save making too much paint.

**ADDING DRIER**

A favored practice is to add the drier next. As it is very essential that this be well mixed through the paste, the method used should be as in the case of the oil and colors—that is, a little at a time, each lot being well stirred in. After the drier has been added then add the turpentine by the same methods as already described. Bear in mind that drier acts only on oil and should be proportioned to the oil—not to the total volume of the paint, nor even to the volume of the oil and turpentine.

To test the color spread a drop of the mixture on a piece of clean glass, turn the glass over and look at the paint through the glass. The side of the paint film that is in contact with the glass will be perfectly smooth and may therefore be easily compared with another batch of paint by spreading a drop of the second batch alongside the sample from the first lot. The slightest difference between the two will be shown up by this method.

Paint is always improved by being allowed to stand a day before using. It should always be strained through a cheese cloth or a fine sieve shortly before it is needed for the job. This process eliminates the paint skins as well as any paint lumps or dirt that may have gotten into the mixture, and it also adds the final touch to a perfect job of mixing.

A good painter will follow these methods as a matter of habit. Good mixing is the foundation of any good paint job. Good work is impossible without good mixing. Keep in mind that turpentine is a thinner and evaporates—and that one quart of it in a batch of paint will thin the mixture about as much as two quarts of oil.

**TURPENTINE HAS TWO USES**

Turpentine in paint has two uses. First, it penetrates the pores of the wood or plaster much better than does the linseed oil and thus enables more of the pigment to be carried into the pores of the surface. That is why some turpentine is nearly always used in priming coats. Second, it is frequently desirable to have more pigment in a paint film than would be obtained in a workable mixture in which the only vehicle was the linseed oil. Turpentine serves as a very handy agent in this case because after the paint has been applied the turpentine evaporates out and leaves on the wall the desired proportion of pigment and oil.
THE SKYSCRAPER
By F. W. FITZPATRICK
Consulting Architect.

THE earliest aspiration heavenward for building in this country was in the mind of the real estate man who a couple of generations ago awoke to the great fact that a one story building had to pay all the ground rent or cost and that each additional story reduced that ground rent or cost just so much. Hungry for profits he naturally wanted to build upward rather than spread out upon the ground.

Of course, in ages far back they built a few things pretty well up in the air, monuments, pyramids, towers and what not, but for sentimental or monumental not economic reasons and most of them, reasons and towers, led but to confusion.

But to get back to the skyscraper—the American institution. Engineers and architects could not satisfy those early real estate cravings for height. The only way to build was with masonry walls and every story superposed required just that much greater thickness, so that a very tall building would mean pretty much all the ground space taken up with brick and stone and just a bit of a hole inside for use! The pyramids are such great masses surrounding a tomb.

Then came the elevator, which was the real creator of the skyscraper, a means of traveling upward, but no place to go. The machine was perfected and it was figured it could travel to a considerable height without necessarily breaking cables. That was quite a feat. That breaking business was no theory either. In 1881 I had the pleasure of coming down six stories in a run-away elevator (not a particularly pleasant sensation).

Well, the demand, the need, the hope for a tall building scheme existed and there was the elevator at hand, the means of making the topmost story as accessible as the ground floor. And no doubt many engineers and others dreamed dreams and perhaps talked about it, but you will find nothing printed nor any record of actual plans being made until 1883.

Early in 1884 I had the temerity—still being young and foolish—to publish the results of a lot of study and figuring and experimenting a Swedish engineer named Strom and I had been doing until we were finally convinced we could go up 25 stories. A scheme of cast iron columns and iron beams forming the skeleton frame of the building and each story’s outer wall, nothing but a shell or curtain wall to keep out the weather, supported on each story’s beams, bracketed out on the outer columns. There was a glorious anvil-chorus: we were crazy, we were dangerous young lunatics, no one with any sense would listen to us. But I was sure of the scheme and of Strom’s figures. As a mathematician I have never known his superior. Three things he could do well—a huge man with a fist on him like a sledge hammer. He could everlastingly figure, he could and did fight for his convictions—woe to him who said we were crazy in Strom’s hearing—and he could consume more red-eye than any human being I have ever known.

We were in Minneapolis, in a leading architect’s office, and we persuaded the latter and the Tribune folks to build, as we planned, a 16-story structure. All was well until the foundations were started and then the owners and the architect got cold feet. They used the scheme but went up only eight stories. The architect later on got some sort of patent, (his ethics were peculiar), and finally sued tall building owners right and left, but was eventually squelched. Meantime Colonel Janney
of Chicago, in 1885, had gotten the steel people to roll certain forms of steel beams and he actually put up a 12-story structure, the first bona fide skyscraper of which we have record. Then came the Masonic Temple in Chicago and hundreds of other buildings in New York and other big cities. The progress of the Art from that point on was rapid, refinement of parts, exactitude of details and endless improvements, but the old column and beam frame still remains the basic, fundamental form of construction, and its has become so sanctioned by usage that we may be justified in averring that the kids of '83 were on the right track anyway.

Today people think nothing of thirty and forty storied building. How quickly we grow accustomed to things that were deemed wonderful. Think of it, '83 is only forty years back. Why, as late as 1902, only twenty years ago, we were building the first tall building in Canada—the Security Bank in Montreal. As usual the terra cotta for the upper stories was completed before that for the first story—an intelligent habit building supply people have. So to save time I ordered the seventh story walls to be built first, each story, of course, being self supporting as to masonry. The building department looked cross-eyed at us, people in adjoining buildings protested, the police forbade us to go on in so dangerous a manner and finally the city enjoined us. The owners, however, backed us up, we gave bond and went on, but the police barricaded the street at the block and diverted traffic while a crow was always gaping—at a safe distance—waiting to see the whole contraption fall down, hoping undoubtedly to witness the mangled remains of the fool architect carried down with the debris.

There is an attraction about building up and a temptation, additional rents. One will walk up to a third story but object strenuously to four, so, presto, in a four story building one must have an elevator. But it seems too bad to be forced to put in an elevator for the one additional story. It will serve a seven storied building at but little added cost. So with the heating and other mechanical plants, the difference between what is needed for four stories and seven is trifling, likewise the upkeep, janitor and so on. There is no comparison between the cost of original installation for four and the extra for the upper three, so that a seven storied building is infinitely more profitable than a four, paying a far greater proportionate return on the additional investment. But after seven stories, more elevators are needed, more boiler, more janitor equipment, but if that is installed one might just as well go up to eleven, then fifteen, then seventeen, then twenty.

At twenty you get into a new order of things, almost a distinct class. You are beginning to wrestle with wind pressure, vibration, counterbalancing of elevators, all that sort of thing. Only in the larger cities, especially where some geographical or other barrier reduces the business section to a small area is one justified in going above that.

I have had much to do with the writing of building laws in our cities and though more or less of a crank on tall buildings I have always sought to keep the limit down to 20 except in a handful of our cities.

In Chicago there is a great temptation to run the "loop" buildings up, but it is only a sentiment, one that has gotten us into a fix with our transportation and such details, for we have unnecessarily crowded everything into the loop. Lately however, we notice a healthy tendency to spread the business district out beyond the loop.

It is in New York that the real demand exists for skyscrapers. In
Chicago we can grow in three directions; in New York but one. So the tendency is to put everything on that narrow strip "down town." Naturally, if you cannot spread laterally you try to go up or down. We do go down five and six stories in New York, easy enough, but there are difficulties on account of light, air, etc., so, perforce, we go up. There is a reasonable limit there too, in the thirty stories. The super skyscrapers, The Woolworth, for instance, a very beautiful tower, add some attraction to the sky-line, but are chiefly advertisement, so is the Wrigley tower of Chicago. When you climb to such great heights you are getting into complicated construction and so costly that the return in rental on those upper stories doesn't justify the expenditure.

Chicago has a limit of height generally to one and a half times the width of the street in front and nothing beyon 260 feet at that. There is an itch in European cities to break out and climb on upward, but so far the conservative element has been strong enough to fix the laws permitting eight and ten stories at most. But I expect London to break out of bonds within the next four years. Paris may come later. She is objecting officially just now; things American are in bad odor there—skyscrapers, American treaties, finance and all. In Berlin they have "projected" a skyscraper already, talking about putting it up near the Bourse or Stock Exchange. It is to be an American skyscraper all of thirteen or fourteen stories. But instead of having an American do it they have invited Berlin architects to compete. Heaven forgive them for calling the result reminiscent of American architecture. It is awful. German pre-war architecture was distressing, but this post-war effort is appalling.

New York has built upward so much that she has made her narrow streets veritable chasms, dark trenches. This is all wrong. It is harmful, affects the health and spirits of people, unhygienic, unjust to the citizens and complicates the traffic.

Some skyscrapers, for example, cast a shadow covering nearly eight acres. The Adams Express building, New York, which is 424 feet high, casts a shadow 875 feet in length; the Equitable building, which is 493 feet high, casts a shadow 1,018 feet in length; the Singer Tower, which is 540 feet high, casts a shadow 1,127 feet in length, and the Woolworth Tower, which is 791 feet high, casts a shadow 1,633 feet in length.

Some skyscrapers cast shadows from a sixth to a third of a mile in length, on surrounding property. Thus the Equitable building's shadow at noon on December 21st, is about one fifth of a mile in length; it completely envelopes an area of 7.59 acres. In some cases not a single window within 447 feet of the street level would receive a ray of direct sunshine.

Twenty years ago it was manifest that the tendency to go upward would result in just such a condition in time, but frankly I didn't think it would be for forty or fifty years, but began agitating in the engineering press a plan to permit one's going up as high as he wanted but doing it sanely and without injustice to neighbors, the streets and his own tenants. A simple enough plan, just stepping the building back from the streets at certain heights, making your tall buildings pyramidal so that the surrounding streets on each block would have light, sunshine, and abundance of air.

Engineers, architects, most everyone it seemed, took a fling at the idiotic notion, calling it wasteful of space, costly, ugly, etc., etc. But
a few converts were made and we kept everlastingly pounding, newspapers, propaganda, laboring with the city officers, the banks and other loan agents—and these were first to realize the general improvement to property it would be—and finally two years ago New York passed the desired regulation and all tall buildings since then conform to that stepping back notion, some mighty fine buildings too, such as the Cunard of twenty-five stories, Ambassador Hotel, Standard Oil, Hide & Leather and similar structures.

Just now certain architects and engineers are vieing with each other to see who will do the loudest shouting for the stepped-back building. They grow quite enthusiastic about it. Just a few days ago I noticed an effusion in a New York magazine, says the author:

“When the United States supports the 500,000,000 inhabitants predicted by statisticians, and our cities have become more vast and crowded than they are now, it will be more necessary than ever to build skyscrapers so that light and air can reach office-workers and people in the streets below.

“Already laws passed in some cities require that the upper stories of all such buildings shall have “set-backs” at an angle determined by each particular section of a city. This angle is found by drawing an imaginary line from the center of the street to the height allowed the first “terrace” in that building zone. All other stories added to the structure must not extend beyond that line. Suppose for instance, that the street is one hundred feet in width, the building laws require that no shall be higher than the street is wide, unless the front is terraced. Then the diagonal line of an imaginary triangle constructed with a base of fifty feet and a vertical leg of one hundred feet, would dictate the slope of the pyramidal front.

“It will be seen, therefore, that in cities having many high buildings, the latter will mount step by step, always receding from the street. These aerial terraces will suggest the construction of roof-gardens, tennis-courts in the clouds, open-air theaters, Greek temples in the sky, and green terraces encircling apartment houses. New York, Chicago, San Francisco, and other great cities will look like Babylon with its hanging gardens.

“Architects are now picturing the probability of each city block being taken up with an enormous pyramid of marble, granite, or terra cotta. In the immense buttresses at the corners, defining the lines of the edifice, would run escalators that would take the place of the usual elevators.

“These radical changes are not so far-fetched as they may at first seem. Equally as phenomenal architectural changes have come in the past twenty years. Scarcely a well-known building standing in New York today was here twenty years ago. Even modern skyscrapers are sacrificed to the movement of business, and a significant thing about twentieth century architecture in this country is that it is not meant to be permanent. “I believe that American cities will gain in architectural harmony and our business districts will be far more restful to the eye and nerves as a result of the uniform height of the terraced structures that I predict, will become familiar in every metropolis.”

How high can we go? Well, that’s something interesting for our younger engineers to figure out and dream about. I may not be as ventures as I was forty years ago, but here, one of the last years I
was in the Government Service at Washington, my chief assistant Lep-
per, (an engineer of splendid calibre, who has done wonders in ship-
building as well as terrestrial construction) and I were off on a bit of
a vacation. It rained most of the time so we played chess and figured
up wind strain, torsion, foundations and what not along a certain line
of progression and assuming certain what might be called standard con-
ditions of subsoil and all that. And we got a building up to 4000 feet,
400 stories about, on a base the size of an ordinary city block 384 feet
square, the base which would be a rock foundation.

But if it were in a land of earthquakes I'd want to be far, far away
from that town, when the shaking began. I put the result of our pro-
found cogitations into an article that was published first in the Popular
Science Monthly of December, 1917, and several other journals since,
much to the amusement and perhaps disgust of the same old conservative
element in our honored profession that formed the anvil-chorus in the
early '80's.

SOME NOTES ON INTERIOR DECORATION
By BERNARD C. JAKWAY

Extension Lecturer on Interior Decoration, University of California

TWENTY years ago the term Interior Decoration, newly arrived
from France and not yet naturalized, was to most Americans vague
and meaningless, while an interior decorator was a man who hung
wall papers or painted ceilings and friezes in a manner heavily Teutonic.
Today both terms are commonly employed and everywhere understood,
the one as comprehending the sum of all the processes by which a house
is made comfortable and beautiful to live in; the other as designating
an individual equipped by training and experience to initiate and carry
out those processes.

One may not like these terms—indeed, I heartily dislike them both
—but they are here; and they would not be here had not the ideas for
which they stand become within the last two decades tremendously im-
potent in American life.

It may be doubted whether any peaceful revolution has ever come
about so quickly as the revolutionary change in the general attitude of
our people toward their homes and toward the home-making processes.
The reasons for this change need not concern us here. The fact is
enough. And the fact is that we have all come to desire a greater mea-
sure of comfort, beauty and comeliness in our homes. In short, we all
want better homes.

It is clear that better homes demand better sites, better planning,
better construction, and a better equipment of those mechanical, labor
savers which now add so greatly to our comfort and convenience. These
factors are, however, of immediate concern only to those who are about
to build new homes. For most of us better homes mean better-furnished
homes, and these in turn mean homes in which the furnishings have
been so chosen and arranged as better to meet our needs, satisfy our
tastes and aspirations, and fit our purses. Interior decoration is a real
creative art, but it is in a peculiar sense an art of selection and arrange-
ment. We can make our homes better only by means of such things
as we can find in the shops and can afford to pay for.

Here we arrive at the great illusion of the layman, and the great
stumbling block in the way of better homes. The housewife thinks in
terms of individual decorative units, rather than in terms of the completed room as a unit. If she has a living room to furnish she thinks of the rug, the sofa, the chairs, lamps, tables and so on that she desires to use in it. When she goes to the stores to look for these things she finds that those individual pieces which seem particularly beautiful are also particularly costly. Quite naturally, she concludes that if she can afford to purchase these costly pieces her room will be beautiful, and that if she cannot afford to purchase them, but must content herself with cheaper things individually far less attractive, beauty will be beyond attainment.

These conclusions are, however, wholly false. It is, of course, a pleasant thing to be surrounded by elaborate and costly furnishings, provided that such furnishings fit one's house and accurately reflect one's way of living; but it is no less a pleasant thing to be surrounded by simple and inexpensive furnishings. So far as beauty, comfort and distinction are concerned, it does not matter whether the things we use are costly or cheap, or in what shop we buy them. All that really matters is the taste and artistic judgment with which these things, whatever their price, are chosen, combined, and arranged in a complete and perfect whole. Twenty Carusoes, singing different scores, would make an intolerable racket; but an artist can get music out of an accordion.

There is another great illusion, and a second stumbling block in the way of better homes. This is the idea that interior decoration is a sort of black art, or at any rate an art demanding faculties possessed by few, and employing processes esoteric and beyond rational explanation. It is true that work of the very highest order demands, here as in the other arts, that power of imagination and of vast artistic synthesis to which we give the name of genius, and that the ways of genius must remain forever hidden to the common man. But it is also true that interior decoration, apart from its masterpieces, is a matter of rational and essentially simple processes, based upon clearly established principles and definable general ideas. We can all learn these principles, and we can all go far toward mastering the processes based upon them. Once we have done so the question of a full or lean purse will cease to trouble us. We shall go to the shops that we desire to patronize, ask for the necessary guidance in technical matters, and then select, assuredly and with no fear of costly disappointment, such things as meet our needs and suit our tastes, and, properly combined, invest our rooms with comfort and with beauty. Here lies the way to better homes.

COMBINATION CHURCH AND MODERN HOTEL

A COMBINATION church and seventeen-story modern hotel is to be New York's latest novelty in buildings. The structure, providing Sunday-school space in the basement, a church in the first three floors and a missionary school on the roof, will be erected on the site of the Metropolitan tabernacle, Broadway and 104th street.

A strict censorship will be exercised over hotel guests and card playing and dancing will be prohibited. The estimated cost is $1,500,000.
Weakest Point of Modern Office Building

The recent big fire in the business section of Chicago demonstrated, according to engineers, that the window is the weakest point of the modern office building and that to retard the spread of fire in a structure of this class precautionary measures must be taken more efficient than heretofore. It appears that on two sides of the sixteen-story Chicago, Burlington and Quincy Railroad building, steel sash and wire glass were used on the windows while the street sides had wooden sash and plate glass except in front of the fire escapes. This alone was enough to condemn the building as a fire proof structure. No matter how fire resisting the floors or partitions, if windows and doors are left unprotected it is an easy matter for the flames to jump from one story to another which was apparently the case in the Chicago, Burlington & Quincy building.

According to investigators the fire seemed to leap from window to window. The Burlington building was not equipped with an automatic sprinkler system and experts maintain that sprinklers would have done much to save the contents of the upper floors. From the eighth floor up there was almost unbelievable destruction by fire, and this in a so-called "fire-proof" building constructed at a cost of $1,500,000!

Asking Bids from the Architect

The trustees of the Siskiyou Union High school district recently called for competitive bids from "pursuant to the provision of Article 1612 of the Political Code of the State of California." There may be some excuse for this isolated mountain community following an obsolete practice entirely out of keeping with modern business and professional ideas, but what of a progressive metropolitan community, like the city of Los Angeles, that does it?

Most architects are emphatically opposed to this sort of thing and it is a pity they are not all of the same opinion, thereby making it impossible for a public board to obtain competent architectural advise except through the recognized legitimate channels. The architect should not be placed in the same class as the contractor who secures his work through competitive bidding. Architects should be paid for services rendered just as other professional men are paid and he should not be asked to cut his fees.
Notes and Comments

Newspapers and Their Indifferent Attitude Towards the Architect

The American Contractor.

Newspapers, as a rule, have been slow to realize the possibilities in the construction industry as an advertising field. Perhaps the various elements in the construction industry are as much to blame for this as are the newspapers. Looking at it from the counting room, the building and construction activities of a modern city offer a greater source of advertising revenue than does the automobile industry. Almost every metropolitan newspaper donates columns of its space to automobile news. Most of this material has no news value. Much of it is foam and froth of the trade puff variety, yet because the automobile industry has the advertising habit also every newspaper in the country gives it free publicity without applying the rules of news to the material published.

Building and construction is more intimately connected with general prosperity and the welfare of the nation than is the automobile industry. A comparatively few papers open their columns to the real news of the building business on anything like the scale with which the automobile industry is favored. Perhaps the most conspicuous example of a newspaper that has come to realize the importance of the building field is the Philadelphia North American. It has been publishing for some time a Construction and Engineering Department, edited by J. A. Githens. Its exhibit during the conference of the National Federation of Construction Industries, in Chicago, was one of the most interesting displays on the convention floor. It was decidedly valuable advertising for Philadelphia and equally valuable for the construction interest of the east.

Architects feel that it is not ethical to pay for advertising. Architects do not object to free advertising. As a rule they rather like it. Engineers, pretty much, share this attitude. The contractor, material dealer, the real estate man and the manufacturer recognizes that his activities are straight business activities and advertising is an important adjunct to every modern business. More advertising in local newspapers is bound to stimulate the interest of that paper in the news developments in the building field; it is bound to open the way for publicity on the fundamental facts and conditions in the building business. That is most desirable.

Many city papers confine their news reports to the real estate field and handle building news from the contractors' point of view. It seems that the public viewpoint ought to be maintained by the newspapers and the various elements in the building field ought to encourage the newspaper that maintains that point of view.

Los Angeles Troubled With Irresponsible Contractors

Southwest Builder and Contractor.

Complaints of those who have been defrauded by irresponsible persons posing as building contractors are still common, despite the warnings issued to the public by the district attorney's office some time ago. These complaints not only cover losses sustained by owners by reason of self-styled "contractors" abandoning jobs with bills unpaid after receiving one or two payments, but also shoddy and careless construction.

Irresponsible persons who pose as building contractors are usually shrewd enough to keep within the law in fleecing the innocent and unsuspecting, and hence cannot be prosecuted. Under the law a "contractor" who pockets the payments received on a job and abandons it is guilty only of a breach of trust, and the person defrauded has no recourse except in the civil courts. A judgment may be secured and recorded, but this avails nothing if it cannot be satisfied; and these irresponsibles are careful not to have any tangible assets that can be attached. However, each case must rest on its own merits, and persons who have been defrauded should not hesitate to tell their stories to the district attorney's office. The cleverest rogue will sometimes slip, and the district attorney will gladly prosecute if grounds can be laid for it.

While the building industry may rightly disclaim responsibility for the "fly-by-night" contractor, it must suffer from the odium of his operations. Responsible builders cannot prevent unscrupulous persons trading on the good name of their business; nor can they alone suppress the "fly-by-night" contractor, but if all branches of the building industry co-operate they can make it so uncomfortable for him that he will not get very far in his operations. It may be contended that it is the owner's place to see that he lets his work to a responsible contractor; but, admitting that may be so, it is not a sufficient reason for the building industry falling to take cognizance of the fact that owners are imposed upon in the name of the contracting business.

A British View of American Architecture

Editorial in Concrete and Constructional Engineering, London.

Whether it was coincidence or fore-
thought—we suspect a combination of the two—that synchronized the exhibition of American architecture at the Royal Institute of British Architects with the disarmament conference at Washington, the incident affords a happy augury for future relationships between the great countries; a fact that Lady Astor, M. P., was quick to realize when, in the course of performing the opening ceremony, she said, "I think America and England should remember that it is taste that unites countries, not treaties." There is a very close parallel between the relationship of the American to the Englishman, and of American architecture to English architecture. It is no rare event for Americans of more thoughtful disposition to experience, on arriving in England for the first time, a strange feeling of kinship; the visit assumes the aspect of a familiar return rather than a new adventure. So, too, the American architect is at once aware that he is amongst the prototypes of his own great national architecture, so far as the French influence, that is now so marked in American architecture is a comparatively modern growth and dates from the World's Fair of 1893, from which date the great name of McKim emerges, and from thence onwards the influence of the Beaux Arts tradition becomes more prominent. America has assimilated the best from Europe, and, the intervention of the Atlantic giving just that distance of vision necessary for freedom from sentiment, has boldly and splendidly converted it to her own ends. Thus it is that we find in some of the smaller works of domestic architecture a delightful harmony between French and English elements that would be impossible in either of the countries of origin. The transplantation of Gothic, however, does not seem to have met with such success. The reason may be that the beauty of Gothic is so largely the result of its very definite structural limitations, and in its history the gradual surmounting of these limitations is to be traced. Today they have been entirely transcended, owing to the development of new materials, so that to build a Gothic structure, retaining these limitations, becomes an anachronism, to build and to ignore them is a sham.

The Englishman, visiting the exhibition, must have been impressed by the greatness of conception, by the scope, and by the opportunity; for architects are limited by the attitude of their age towards architecture. There is, it is true, a certain interaction; opportunities make architects, and architects make opportunities, nevertheless, it must not be overlooked that in America the commercial asset of a fine building is understood; moreover, there exists among the people what may be termed an architectural consciousness which is gradually being created in England, but the process is slow and laborious, and until it is effected we shall continue to have meanness and ugliness in our midst. Meanwhile, we look with envy and admiration at American work, we are astounded at its scale and its prodigality and at that elusive quality which applies equally to architecture as to mankind, and which, in the latter connection, is referred to as good form. An aspect of this quality is revealed in the extreme refinement of detail. Particularly is this noticeable in domestic work. Care is expended on such details as the exact texture of brickwork and in its pointing, in the moulding of the smallest architrave, and the graining of a door. Everything assumes a proper degree of importance and receives a proper degree of attention. It must not be assumed that the English and the French are the only European influences to be found in American work; often the inspiration can be traced directly to the source of the Italian Renaissance or, as in the Pennsylvania Railroad Station at New York, one of the greatest achievements of McKim, Mead & White, to Imperial Rome, and here and there Spanish elements are to be observed. The rich diversity of treatment is largely the result of climatic conditions which vary immensely in different parts of the country. It is difficult to appreciate the significance of this influence, accustomed as we are to our own so very limited variations, and viewing work gathered together from all quarters of half a vast continent within the confines of a small gallery.

Yet over all there is a spirit of modernity. The European elements are made to live again because they are synthesized into something new, virile and expressive of a great architecture-loving people. And this boldness of attack is not limited to the designs, but extends also to the handling of materials. No prejudices are allowed to stand in the way of the use of a material if its efficiency be proved. Architecture is, after all, subservient to humanity, and must therefore be subjected to a never-ceasing change. It cannot live in the past and serve the present. Thus we find that the American architect is quick to realize the possibilities of concrete as a material for every class of building, and quick to discover and exploit its aesthetic possibilities. Assuredly we have lessons to learn from America, and we shall be helped in our instruction by exhibitions such as the one recently displayed upon the walls of the Royal Institute of British Architects,—Engineering and Contracting.
Scottish Rite Cathedral
Messrs. Weeks and Day, architects in the California Commercial Union building, San Francisco, have been commissioned to prepare plans for the new Scottish Rite Cathedral to be built in San Francisco for the California Body, at an estimated cost of $900,000. Messrs. Weeks and Day have also been appointed architects for the new $500,000 market building to be erected on the block bounded by Market, Eighth and Mission streets, San Francisco. It will be the largest market building west of Chicago.

Salvation Army Building
A contract has been let by Architect Norman R. Coulter of San Francisco, to Vukicevich & Bagge, 180 Jessie street, San Francisco, to construct a nine-story reinforced concrete building for the Salvation Army on McAllister street, adjoining the Hibernia bank, for approximately $250,000. The same contractors have been awarded a contract to build a one-story Class "C" store building and undertaking establishment on California street, east of Polk, San Francisco, for Mr. B. Getz, from plans by Architects Morrow & Garren.

Oakland Physicians' Building
Plans are being completed by Architect Willis Lowe, Monadnock building, San Francisco, for a nine-story reinforced concrete physician's building for Dr. Robert Dunn and associates, at the corner of 19th and Franklin streets, Oakland. Ground will be broken June 1st and construction will be in charge of Mr. P. A. Palmer. Mr. Lowe is also making plans for a $10,000 home for himself in Lakeshore Highlands.

$100,000 Apartment House
Architect Albert Farr, San Francisco, is preparing plans for an apartment house, 123x127, to be built on Jackson street, between Broderick and Divisadero streets, San Francisco, for Mrs. James W. Ward of 2821 Jackson street.

Theatre Alterations
Extensive alterations are to be made this summer to the Portola theatre, San Francisco, and the plans are now in the hands of Architect Alfred Henry Jacobs, 110 Sutter street.

Apartments and Hotel
Architect Louis Mastropasqua, 580 Washington street, San Francisco, has completed plans for five residence apartments for Mrs. L. Liati on Larkin street, south of Greenwich, San Francisco. The estimated cost of the improvements is $40,000. Mr. Mastropasqua is also preparing drawings for a three-story brick hotel of forty rooms to be built in Pittsburgh, Contra Costa county, for S. Garusio & Bros.

Architect to Build Apartments
A three-story and basement concrete, frame and stucco apartment house is to be built at once on the north side of Sacramento street, between Franklin and Gough streets, San Francisco, for Mr. Milton Latham, San Francisco architect, from his own plans. The building which is to cost $50,000 will contain six residence apartments of six rooms each, two baths, servant's quarters and garage accommodations.

Designing Costly Homes
Three large residences varying in cost from $25,000 to $45,000 are being designed by Architect Louis M. Upton, 454 Montgomery street, San Francisco. One of these houses is for Margaret E. Wilson, whose home will occupy a marine-view lot on Lake street, San Francisco. A second house will be in Burlingame, and a third in Alameda county.

Richmond Architect Busy
New work in the office of Architect James T. Narbett, 910 MacDonald avenue, Richmond, includes a $35,000 addition to the Brentwood Grammar school, a memorial hall for the town of Brentwood, a memorial building costing $100,000 for the city of Richmond, and a bank building at Calistoga, Napa county, for the Bank of Calistoga.

San Jose Architect Busy
New work in the office of Chas. S. McKenzie, Bank of San Jose building, San Jose, includes a reinforced concrete store building at Mountain View to cost $20,000; an addition to the Cupertino Grammar school and residences, varying in cost from $8,000 to $15,000 for Messrs. Frank King, Dr. A. McMillan and Herbert Jones.
Architect W. H. Weeks Busy

New work in the office of Architect William H. Weeks, 369 Pine street, San Francisco, includes completion of working drawings for an addition to the Orleans High school, costing $60,000; addition to the First National Bank building, Exeter; shop building for the Willows High school; two-story brick high school building at Turlock to cost $175,000; a $50,000 addition to the Los Altos Grammar school; a two-story reinforced concrete high school building at Napa, to cost $300,000; a one-story reinforced concrete garage at Gilroy, for Mrs. Annabelle Ellis; a $20,000 auditorium for the Fruitvale Christian church; and a $12,000 addition to the Grace Methodist Episcopal church at Palo Alto. Architect Robert H. Orr of Los Angeles is associated with Mr. Weeks on the two last-named buildings.

Designs Many Buildings

Architect S. Heiman, 57 Post street, San Francisco, has recently completed plans for a number of new buildings to be erected in San Francisco, Oakland and Los Angeles, including a six-story department store for Dunn-Williams & Company, Los Angeles, to cost $550,000; a three-story apartment house on Scott street, north of Hayes, San Francisco, for Mr. H. Cohen, to cost $30,000; a one-story machine shop for Mr. Louis R. Lurie on Folsom street, San Francisco and a one-story brick store building for Mr. Emil E. Kahn on San Pablo avenue, Oakland.

Prof. Gregg Going Abroad

Professor John William Gregg, landscape architect and head of that division in the University of California, has just been granted sabbatical leave and will spend the year in travel through Europe for the purpose of studying old and new examples of landscape architecture, city and town planning. Professor Gregg is a member of the American Society of Landscape Architects, and besides being on the Faculty of the University of California is landscape architect for the California State land Settlement board and the designer of the two model agricultural towns at Delhi and Ballico, California.

Stanford University Buildings

Plans are being completed by Architects Bakewell & Brown of San Francisco for a reinforced concrete dormitory with accommodations for 120 students and a dining room of the same type of construction at Stanford University; the two to cost in the neighborhood of $500,000.

Will Travel Abroad

Architect John P. Krempel and Mr. Carl Leonardt, president of the southwestern Portland Cement Co., Los Angeles, have departed for an extended European tour. They will tour through England, France, Italy, Switzerland, Belgium, Germany and possibly other countries. They expect to return to Los Angeles in November.

Architects Move

Architect Elwin P. Norberg formerly of 6034 Hollywood boulevard, will move his offices immediately to 704 Union Bank building, Eighth and Hill streets, Los Angeles. In the new location, Mr. Norberg will have as his associate Charles E. Norberg, his father, who will move his office from Pasadena.

Opens Los Angeles Office

Mr. Joseph L. Roberts, one of the oldest practicing architects in California, has established an office at 702 South Spring street, Los Angeles. Mr. Roberts was formerly located in San Francisco and began the practice of architecture in that city in 1877. Mr. A. H. deWaar, formerly engineer for Wurster Construction Co., is associated with Mr. Roberts.

Personal

Mr. W. S. Hebbard, architect, formerly of San Diego, announces that he has resumed the practice of architecture after an absence of several years spent as assistant superintendent engineer U. S. Army Transport service and has opened offices at 664-5 I. W. Hellman building, Los Angeles.

Mr. William H. Wheeler will be associated with Mr. Hebbard.

Santa Rosa Elk's Building

Messrs. Will D. and Frank Shea, San Francisco architects, have been commissioned to prepare plans for a three-story reinforced concrete lodge and office building for the Santa Rosa Lodge of Elks. About $200,000 will be expended on the improvements.

Vallejo Lodge Building

Architect Chas. E. Perry of Vallejo, has been commissioned to prepare plans for a three-story store and lodge building for Somoset Tribe, No. 22, Order of Redmen. The estimated cost is $60,000.

Architectural Examination

Examinations for architectural designer, grade V, salary $285 to $350 a month, and grade IV, salary $225 to $280 a month, to be held at Los Angeles and San Francisco, May 27, are announced by the California State civil service commission.
Branch Bank Buildings

The American National Bank of San Francisco and Oakland, will build three branch bank buildings in Alameda county, one on Fruitvale avenue, Diamond; one on East 14th street, and one in Piedmont near the Key Route station. The plans for these buildings are being prepared by Architect Edward T. Fouke, Crocker building, San Francisco.

Bank and Office Building

Contracts have been let for the construction of a twelve-story class "A" bank and office building at Broadway and American avenue, Long Beach, for Mr. Edward John. Building will cost $850,000. Mr. W. Horace Austin is the architect.

Reedley High School

Plans are being completed by Architect Norman F. Marsh, Broadway Central Bank building, Los Angeles, for a group of high school buildings at Reedley, to cost $450,000.

Stockton Architect Busy

New work in the office of Architect Ralph P. Morrell, 41 South Sutter street, Stockton, includes a three-story frame apartment house for Julia O. Zerweck to cost $58,000; a frame residence for Dr. Nelson Katz to cost $9000; ward building at the county hospital to cost $85,000; an $18,000 residence for Mr. Thomas E. Connelly and a $15,000 house for Mr. Samuel Zimmermann.

Gas and Electric Building

Architects Bakewell & Brown of San Francisco, have been commissioned to prepare plans for the new office building of the Pacific Gas & Electric Company at Market and Beale streets, San Francisco. The structure will adjoin the new Matson building now under construction and will probably be sixteen stories in height. It will cost $1,250,000.

Federal Bank Building

Architect James W. Plachek of Berkeley is preparing plans for a two-story reinforced concrete bank building, 100x130, for the Federal Land Bank of the College City. It will be erected at the corner of Kittredge and Fulton streets, Berkeley, at an outlay of $100,000.

Crocker Oaks Residences

Three houses have been designed for Crocker Highlands and Crocker Oaks by Mr. A. Merrill Bowser, Hearst building, San Francisco. They will cost from $8500 to $15,000 each and are for Messrs. Irving Magnes, Albert Claassen and Dr. H. J. Samuels.

Returns From Abroad

Mr. Donald B. Parkinson, junior member of the firm of Messrs. John Parkinson and Donald B. Parkinson, architects, has returned from a European trip which was taken both as a wedding trip and for the purpose of studying architecture. Most of the time was spent in England, France, Italy, Sicily and Northern Africa. Mr. Parkinson was away seven months and brought back many water color drawings and sketches of interesting examples of European architecture.

Berkeley Parochial School

Plans have been completed by Architect J. O. Lofquist, 2149 Broadway, Oakland, for a two-story and basement frame and brick veneer parochial school for the Archbishop of San Francisco diocese. The building will be 60x150 feet and will contain auditorium, classrooms and library. Construction will be in charge of Mr. Henry McCullough, Berkeley contractor, and will cost $65,000.

Berkeley Fraternal Houses

Two new fraternity houses are to be constructed this spring in Berkeley, one on Piedmont avenue for the Kappa Sigma Fraternity, from plans by Architect C. C. Dukin, and the other on Durant street, near College avenue, for the Phi Mu Society, from plans by Architect W. H. Ratcliff, Jr.

Store and Loft Building

Two buildings have been designed by Architect A. G. Headman, Call building, San Francisco, for Mr. Mortimer S. Samuel. One will be built on Turk street, west of Taylor, and will contain stores, bowling alley and lofts, and the other will be a studio building on Sutter street.

Addition to Factory

Contract has been let to Lawton & Vezey to build a two-story reinforced concrete and brick addition, 200x60, to the Magnovox factory on East 14th street, Oakland. The production of this company has more than doubled since the radio came into popular use. The plans for the addition were made by Architect B. J. S. Cahill.

Pasadena Planning Commission

An ordinance creating a city planning commission for Pasadena has been passed, the commission to consist of twelve members, nine of which shall not be officers or employees of the city. Three are to be appointed by the board of directors from its own membership. The city engineer is authorized to attend and participate in the meetings of the commission but will not be entitled to a vote.
Engineer Declines Directorship
Mr. C. A. Heinze, former president of Los Angeles Chapter, American Association of Engineers, has withdrawn from the nomination for director of the national organization for the second district, comprising California and Nevada. Business duties prevent him accepting the position. Mr. Hubert P. Ferry, first vice-president of Los Angeles Chapter, has been nominated for national director, and members of the A. A. E. may write his name on the ballot which has been printed with a blank for the second district.

Hoover for Federal Development
Secretary of Commerce Herbert Hoover, is quoted as having said to Congressman Lineberger of California, that "If a Pacific Coast power company through James P. Girand, or anyone else, is able to persuade the Federal power commission to allow it to secure a permanent permit to develop Diamond creek, above Boulder Canyon, I think the time has come for me to resign as head of the commission. I am for government development of that project, and I always have been."

American Society of Civil Engineers
The proposed "Water and Power Act" which is to be submitted to the people of California at the November election was the topic for discussion at the regular meeting of Los Angeles Section, American Society of Civil Engineers, at the Los Angeles City Club, May 10. Mr. William Mulholland led the discussion in favor of the act and Mr. George F. Binckley led the discussion against it. Copies of the act are furnished through courtesy of the People's Economy League of all California Engineers.

Landscape Work
Mr. Emerson Knight, landscape architect, is preparing plans for Allen & Company for the gardens of four houses on Lake street, extending 240 feet from 29th to 30th avenues in Sea Cliff, San Francisco. Careful study is being made for a comprehensive and unified treatment of these places such as now characterizes the gardens of the three homes opposite for which the landscape work has just been completed by Mr. Knight.

Elected President
Honor recently was conferred upon a San Francisco architect, Mr. William Arthur Newman, by the Society of Constructors of Federal buildings in session at Washington, D. C. Mr. Newman being elected to the presidency of the Society by unanimous vote. Mr. Newman is assistant to Mr. J. W. Roberts, Superintendent of Construction and Repairs, U. S. Public buildings, San Francisco. An invitation has been extended to the National Society to hold its next convention in California.

Mr. Winslow the Architect
The full page half tone plate published on page 92 in the April number of The Architect and Engineer over the caption, "Entrance to Home in Monterey," was erroneously worded, being the entrance to the Adobe Flores in South Pasadena, an old restored adobe belonging to Mrs. C. E. Noyes. Mr. Carleton Monro Winslow of Los Angeles was the architect. It is a pleasure to give Mr. Winslow due credit for this very lovely picture.

The "Electric Towel"
One of the modern Electrical Appliances making rapid progress in new installations is "Airdry," the electric towel.
Press a pedal with the foot and warm air does the rest. That tells the story of "Airdry," an electrical appliance designed to eliminate towels in schools, hospitals, factories, public buildings, hotels, department stores, office buildings, etc. It consists of a white iron standard, containing a motor, a fan, heating element, and an adjustable nozzle for directing the flow of electrically heated air. The warm air discharged from the nozzle, causes evaporation and dries the skin thoroughly, preventing chapping. One of the greatest advantages to be found in the use of the "electric towel" is that one can touch what has been used by another.
"Airdry" thoroughly evaporates the water from the face or hands in twenty-eight to thirty-six seconds. It consumes 1 k. w. per hour, or per 100 operations. This is far less than the cost of towels of any description.
The "Airdry" is easily installed by providing a circuit of not smaller than No. 12 b. & s. Ga., wire to the nearest junction box. "Airdry" overcomes the unsightly condition of the laboratory floor being littered with used towels, and reduces the fire hazard and janitor service. It also eliminates the possibility of clogged waste pipes. There are two models, a pedestal, that is movable and a recess wall model for permanent installation.
The "electric towel" is manufactured by the Corona Airdry Corporation of Groton, N. Y., and is sold and distributed in California by the Airdry Co., of California, with offices at 155 Montgomery street, San Francisco.
Interlocking Device for Opera Chairs

An interlocking device for opera chairs has been invented by Mr. O. F. Wasmandorff of Lewistown Montana. Two photographs of models are shown, one being a general view and the other a detail picture. The new device is considered an improvement on present seating for auditorium, baseball park and moving picture theater chairs. Some of the advantages of the new device are given as follows:

To prevent pre-emption of aisle seats.
To prevent loss by undiscovered vacant seats in middle of audience.
To prevent annoyance of late comers squeezing past patrons already seated.
To prevent annoyance of those having witnessed performance squeezing past late comers in endeavoring to get out.
To turn up all vacant seats, making aisles of all vacant groups of seats.
To make all vacant seats readily visible and accessible.
To cut down number of ushers now necessary.
To increase seating capacity by re-arrangement of seats.
To make aisles of all rows of seats when audience arises.
To prevent accidents during possible panics which might have been caused by seats left down when unoccupied.

To facilitate sweeping out of auditorium as all seats are automatically turned up when not in use.
To prevent interference of incoming audiences with outgoing audiences.
To facilitate the emptying of theaters by new arrangement of aisles and exits suggested by the use of this device.
To cause the public to use certain aisles for entrance and certain other aisles for exit.

The model shown in the general view has been prepared to illustrate an interlocking hinge joint only. This picture does not present any particular style of chair, as any form of back or upholstered seat of any desired quality may be used with this interlocking device.

Points of interest in this picture are as follows: These chairs have been mounted on a base, the center standard being pushed back more than two inches from a straight line drawn between the two outer standards to demonstrate that this device will work perfectly where chairs are set on a radius as sharp as eight feet. The seat brackets are standard right and left brackets with a cam cast on each one to move an interlocking bolt as the chair is depressed. They are all interchangeable throughout the entire auditorium. Upper portion of the seat
bracket slides sideways, where seats are placed on a decided radius, as seat is depressed, but the slides shown in this model are built out from the seat because the seat selected by the model maker is curved veneer. Where straight bottom chairs are used with upholstery this slide is much simplified. The end of seats have the same kind of tubing for hinge center as intermediate seats, but are shorter and need not be slotted.

Tubing of hinge is fitted loosely into the main chair standard, and is held in place by two flush set screws on top which are difficult to see in this picture.

The detail picture shows a portion of the main standard. Note that the standard is thickened for the slotted tubing to slip through. Two flush set screws hold the pipe in place after insertion. The center hole in front is for the wing nut. The latter, shown below, is given one-half turn after controlling chair seat is depressed, when it is desired to hold interlocking bolt out to keep chair from locking when not in use. The lower hole shown in main standard need not be there in the finished product. Cams cast on seat brackets show plainly here, also travel of seat bracket on clip above is easily detected by wear of paint on clip. This travel occurs when chairs are set on very short radius only.

Tubing inserted through brackets and main standard, forms the main journal bearing of hinges and is unbreakable. The parts which travel inside the tubing are shown below, consisting of cotter pin, compression spring, interlocking bolt, rubber bumper to make bolt noiseless, and another cotter pin. To reverse action of chairs reverse order of inserting moveable parts; then the opposite chair will control.

National Board of Engineers Defines Future Policy

T HE national board of directors, American Association of Engineers, has issued a statement of policy which is to be pursued during the year. The declaration of the future policy of the board comes as a surprise and will undoubtedly be welcomed by every member of the California chapters. It is strictly in line with the policy which has been advocated for the past year by the local chapters.

The national board has struck upon a plan which, it is believed, will secure the unanimous approval and support of every chapter throughout the country.

The declaration follows:

The board of directors keenly appreciates the need of additional service on the part of the American Association of Engineers to its members and to the profession, and as such enlarged service can be obtained only by adopting and following a constructive program, therefore to this end the board of directors approves the following statement of policies:

(a) All employment service should be greatly extended and made more comprehensive and so organized that the benefits accruing therefrom may be more equitably distributed between the national headquarters and the districts or branches.

(b) A determined effort should be made to render real service not only to all members, but to large groups, such as railroad, Federal, practicing and in public service. The assistance extended to such groups should be from funds derived from fees and dues received from the entire membership.

(c) Continued efforts should be made to perfect the service of the local headquarters to the end that the number of even occasional mistakes may be still further reduced.

(d) An exhaustive and unbiased investigation should be made of the suggested plan for the formation of practically autonomous districts or assemblies with paid staffs under the authority of national headquarters, which districts or branches would handle most of the detail work. This investigation should be made in the hope that the plan will result in quicker and better service to the members.

(e) If financially feasible, several energetic and enthusiastic field representatives should be provided whose duties will be to help in the organization of new clubs, chapters and assemblies and to stimulate and help existing ones, to harmonize disputes, facilitate co-operation between national headquarters and the smaller units, and to gain for headquarters a true insight into conditions affecting the association in all parts of the country.

And further, under present conditions, chiefly those imposed by financial consideration, it has been impossible to engage to the extent desired in these various activities, therefore the executive committee is instructed to prepare and submit to the board of directors at its next meeting a plan and a budget for extended service in accordance with the above policies in the hope that the board may present to the Salt Lake convention plans satisfactory to the membership by which it may be possible to extend and initiate the service such as is the desire and wish of every member of the association.
No matter how fine the architecture may be, a garage is not a successful place to store an automobile unless the hardware allows the doors to open and close easily.

The advantages of Stanley Garage Hardware, in a set, are many; everything is included—each item is of the proper strength, design and finish.

Another advantage is the sturdy type of Ball Bearing Hinge, included in the sets. The Ball Bearings eliminate wear on the joints and make for easy operation of the doors.

The majority of Stanley Garage Hardware sets include a Stanley Garage Door Holder, a very necessary piece of hardware for any garage. Its purpose is to hold the doors open against the wind, preventing them from being blown closed—damaging the fenders and lamps.

Without doubt, the most important reason for advocating the use of Stanley Garage Hardware on your client’s garage is, he knows of the hardware and also of the kind of service it gives. You will not have to argue and unnecessarily explain the merits of Stanley Garage Hardware because it is well known for its dependable quality and well arranged sets.

Have you received a copy of the new Garage Hardware Catalog? If not, ask for AE-5.
THE BUILDING CODE SITUATION*

By DUDLEY F. HOLTMAN
Construction Engineer, National Lumber Manufacturers’ Association.

URING the past two years the National Lumber Manufacturers’ Association has made a thorough field survey of building code conditions in every city of any importance in the United States. Our field representatives have devoted all of their time to this work and we now have in our files in Washington up-to-date accurate information, relative to the status of building ordinance legislation in practically every city in the country, with a population of over 5,000. The information that we have obtained is kept up-to-date by means of a well-organized system of correspondence, so that our files show the current status of code activities in all of these cities.

Industries and building investment cannot proceed until all forms of cost inflation, which have loaded it with unnecessary capitalization charges, are removed. We must face the situation squarely. We must put aside all thoughts of special interest or privilege and prepare our building codes on the basis of a well-recognized minimum requirement.

A well prepared building law will do much to insure prompt investment in building. A poorly prepared building law, full of unwise and unnecessary restrictions, may so handicap building construction as to put a blight on the growth and prospects of the community. Every building law should be considered as a building service for the protection of the owners and occupants of buildings and as an assistance to builders, rather than as a restriction imposed upon them. It should serve as an infallible guide to the minimum expense consistent with safety and dependability of building construction. For this purpose it should be sufficiently flexible to allow for individuality and selection and for efficiency and for changing conditions. If this is done it will allow sufficient competition to keep costs at a minimum for all forms of construction.

The lack of ordinances regulating construction in the majority of the cities of this country is astonishing. There are 1478 cities in this country of ours with a population of 5,000 or more. Our information indicates that only 410, or 27%, have a building law, and in all probability twenty or more of these laws are included as a part of the original city charter. Other cities claiming codes have what is merely a set of restrictions specifying the area known as the “fire limits.” In the majority of cases, where fire limit restrictions only prevail, the ordinance merely specifies the area included within such limits and requires that the buildings erected there-in shall have incombustible walls and roofs. They make no restrictions as to the allowable height of buildings. They say nothing about maximum areas between fire walls nor do they mention the character of interior construction.

Any kind of a fire-trap interior may be constructed and it may cover any area as long as the exterior walls are masonry walls and the roofs supposedly incombustible. In all probability these kinds of laws are the only ones in effect in 65% of these 1478 cities.

There are 259 cities with a population of over 25,000 and only 228, or 88%, of these cities give evidence of having a building code. Thirteen of these cities have codes with no enforcing officer, while 23 cities have no code whatever, but do have a building inspector.

Of the 460 cities with a population of from 10,000 to 25,000, only 116, or 25% have a building law, and 26 of these have no officer to enforce it. Of the total of 739 cities with a population ranging between 5,000 and 10,000, only 81, or 9%, have building laws, and 25 of these cities have no means of enforcing the law.

A number of the cities which have codes have no copies available for the use of the public or for the use of contractors and architects. Some of these regulations are hidden away in the minutes of the council meetings. A man who erects a building, or who has the supervision of the construction of a building in hand, must delve through musty records to determine what regulations he is expected to comply with.

It is very evident that the preparation and enforcement of a building law is a specialty. It is a matter of such importance that the work should not be entrusted to any inexperienced or improperly constituted body. Experience during recent years indicates that building codes, in order to be most beneficial, must undergo frequent amendment and

*From an address, “Analysis of the Building Code Situation in the United States,” delivered by Mr. Holtman before the National Conference of the Construction Industry held under the auspices of The National Federation of Construction Industries at the Drake Hotel, Chicago, April 5, 1922.
SAN FRANCISCO STATE BUILDING—Architects: Bliss & Faville

ORNAMENTAL IRON

Stairs, Railings, Elevator-Fronts, Cast Iron Flag Pole Bases, Steel Sash and Doors in Boiler Room, etc.

Furnished By

Michel & Pfeffer
Iron Works

Tenth and Harrison Streets

Phone
Market 730

KENNEDY
The Standard Valve

The test of valve quality is the length of time the valve continues to render the most efficient service without giving trouble or entailing expense. There are Kennedy Valves of the long-time kind all over the United States and Canada doing good work in every variety of valve service.

You can be sure that every Kennedy Valve you install will be permanently satisfactory in every way. The Kennedy Catalog explains the details of design and construction that assure easy operation, low repair cost, negligible attendance and unusual durability. Send for a copy and use it to help make a selection of Kennedy Valves for trial.

THE KENNEDY VALVE
Mfg. Co., Elmira, N.Y.

Branches and Supply Depots:
NEW YORK, 95 John Street
BOSTON, 47 India Street
SAN FRANCISCO, 23-25 Minna Street
CHICAGO, 204-8 N. Jefferson Street

Sales Offices:
Philadelphia
Salt Lake City
Seattle
El Paso

When writing to Advertisers please mention this magazine.
addition. Methods and materials of construction and the uses to which buildings are put are constantly changing. New economic conditions bring about new kinds of buildings and in any case there are a great number of minor contingen-
cies for which it is impossible to provide in an ordinance. It has been found des-
sirable, therefore, that the official in charge of building legislation be given the power to formulate and publish rulings elaborating upon the building code as enacted by the legislative body of the city.

A building code is intended to be a statement of the economic requirements as to quality of materials, grade of workmanship and methods of design which are considered necessary to make build-

ings safe, durable and otherwise satisfactory. A building code should not be too definite and detailed in its provi-
sions lest it lose a part of its possibili-
ties for good and unduly hamper private initiative and enterprise. In effect, therefore, such an ordinance usually is a compromise between the necessity of telling the public what is required of it, and of having a brief, flexible docu-
ment for purposes of administration. Any building code represents this compromise at which its writers arrive at with re-
gard to these two questions.

The lumber industry welcomes open competition. With the aid of certain fire prevention enthusiasts, “substitute” ma-
terial manufacturers make an effort to legislate lumber out of markets where, as a material, it has a just claim for rec-
ognition. It is this kind of “competition by legislation” which the lumber indus-
try finds particularly obnoxious and which it intends to make every effort to have staved. Every material has its advantages and disadvantages and in the long run no propaganda can over-
come the truth.

In my judgment it is not necessary to tell intelligent people that wood will burn. It is also pretty generally known that any residence is liable to destruc-
tion by fire. There are many safeguards which can be used in all kinds of build-
ing construction and slow burning con-
struction is just as possible when wood is used as when other materials are used. There is a tendency, as a city grows, to enlarge the fire limits of that city until those limits extend way out into the suburban districts. The citi-
zens owning a lot anywhere within those limits must either build “fireproof” or not build at all. The result is a great deal of undeveloped property. We might just as well recognize the fact that cost is an important element entering into the calculations which any prospective home owner makes. He should be en-
couraged to improve his property and he should be given an opportunity to build any kind of a house that he wants to as long as it meets with the ideas which the community entertains with respect to fire hazards. Tests have been made and are being made by the lumber manu-
facturers of the country, in co-operation with other manufacturing interests, which clearly indicate that certain types of construction, of which wood is the frame work, offer a resistance to attack by fire quite sufficient to protect them from any ordinary exposure hazard. These constructions should be recog-
nized by city officials when they revise their codes.

The time has come when we must undertake to do everything that we can to encourage the salaried man to buil-
d and we must encourage him by offering him every inducement to “start some-
thing.” This we can do in large mea-
sure by revising those antiquated, obso-
lete building ordinances which require him—if he builds now—to build notin-
less than a “tomb” to meet all of the un-
necessary restrictions imposed upon him by those enthusiastic elements of so-
ociety whose battle cry is “fire.”

Division of Costs in Highway Construction

What part of the cost of a road goes into grading and structures which are more or less permanent and what part goes into the paving which may eventu-
ally wear out?

This question is answered fully by statistics compiled by the Bureau of Pub-
lic Roads of the U. S. Department of Agriculture on 1350 completed Federal-
aid road projects involving 7500 miles of roads at a total cost of $112,000,000. Of the total cost, 21.5 went into grading, 14% structures, 62% paving and 3% for en-
gineering. These are the average figures for the whole of the United States and there is considerable variation in differ-
ent sections.

In the Middle Atlantic States where grading is not heavy and paving must be built for heavy traffic the cost of the paving rises to 75% and the grading and structures amount to 15% and 9% respectively.

In the Mountain States the problem is very different much of the work being new construction with heavy grading and where the highest type of surface is not necessary. In this group of States the cost of grading amounted to 33% struc-
tures 21% and paving 41%. The percent-
age for California in 1922 will probably be somewhat less than 25% for paving only.
COLOR in ARCHITECTURE

Chromatic possibility in Terra Cotta is wider than in any other permanently enduring material. It offers a practically unlimited palette for:

(i) Color interest in monochrome. (2) Color interest in polychrome.

All buildings, whatever the material, necessarily present a color scheme. Rightly conceived color is the chromatic effect in the entire ensemble, whether polychrome or monochrome.

In the building illustrated the polychrome ornament ties with the pink mottled field of ashlar. Both are Terra Cotta; the effect is harmonious unity.

With unity assured in the consistent qualities of ceramic coloring, Terra Cotta safely achieves the fullest chromatic richness either in monochrome or polychrome treatment.

Send for our literature and information on Terra Cotta. Address: National Terra Cotta Society, 19 West 44th St., New York, N. Y.

TERRA COTTA

Permanent Beautiful Profitable
Building Wages and Cost of Living

The actual relation of wages now being paid in certain typical cities to the wages paid in the same cities in 1914, and also the relation which the present wages bear to the cost of living in December, 1920, are shown by diagrams recently published in the index of the Associated General Contractors. This cost of living has just been determined by the Department of Labor.

In some instances, where more than one wage rate was paid either in 1914 or in 1922, the average representing existing conditions was used.

In general it is evident that the percentage increases of certain wages over pre-war wages is by no means uniform in the different trades, nor is the general average of these increases uniform in the different cities as compared with the changes in the cost of living. It is clear that the wages now being received by some of the trades enable them to buy more of the good things of life than they could with the pre-war wages, while in other cases the present wage will purchase a considerably poorer living than the wage which ruled in 1914.

In Boston, out of thirteen trades, three are receiving slightly more than sufficient wages to compensate for the present cost of living as compared with that of 1914, four are receiving almost enough, and six decidedly less than sufficient to provide a scale of living equivalent to what could be bought under pre-war wages and conditions.

Workers in the building trades in Washington, D. C., have thus far been decidedly more successful than those in other cities in boosting their effective wages above the pre-war standard. Every one of twelve Washington trades are receiving wages which, in purchasing power, are considerably in excess of the wages prevailing in 1914.

Baltimore is one of the cities where building trades artisans are better off financially than they were before the war. All but one of the ten trades are now receiving wages having a purchasing power in excess of the wages received in 1914.

The present wages paid in Chicago are those established by the Landis Decision. In the case of nine trades at least it appears that the rates under the Landis Decision are in no case sufficient to procure as good a living on the basis of present costs as was purchaseable by the wages prevailing in 1914.

In San Francisco four of the nine trades considered are enjoying wage rates sufficient to more than compensate for the increase in the cost of living, and five are receiving less than that requirement.

In Los Angeles, eight out of twelve trades are receiving wages sufficient to
Entrance of Euclid Avenue Temple, Cleveland, Ohio. Lehman & Schmidt, Architects

The dignity of these arched portals is enhanced by the durability of the everlasting material employed and the way it has been utilized in working out the simple and beautiful details.

More Suggestions for Artistic Brickwork

The Portfolio of Architectural Details in Brickwork has now been enlarged to over one hundred de luxe half-tone plates, by the additions of Series II and III. Each series is assembled in an enclosed folder, with printed tab, ready for filing. The subjects cover a wide variety of details, both interior and exterior, and show many exquisite effects that the architect can secure by using standard sized brick in his designs.

A set of these folders will be sent to any architect requesting them on his office stationery, and his name will be placed on the list for future mailings.

AMERICAN FACE BRICK ASSOCIATION
1159 WESTMINSTER BUILDING • CHICAGO, ILLINOIS

When writing to Advertisers please mention this magazine.
substantially more than compensate for the present cost of living as compared with the pre-war cost. On the other hand, four of the trades, among them common labor, are receiving less than sufficient to compensate for the increased cost of living.

Planning New City

Mr. Charles H. Cheney, City Planning Expert, has been retained to assist in planning the Palos Verdes project in Southern California. Mr. Cheney recently went over the St. Francis Wood tract with Senator N. W. Thompson and Elvon Musick, as the restrictions, landscaping and general layout there are to be taken as a model in the new Southern city. Olmstead Bros., landscape architects, who subdivided and planted St. Francis Wood, will have charge of the same part of the work in the Los Angeles project.

Concrete Roads Discussed by Institute at Cleveland Convention

While it was something of an experiment for the American Concrete Institute to hold its eighteenth annual convention in Cleveland after a number of years it which it had built up a large local following in Chicago, the attendance at the convention held in the Hotel Winton, February 13-16 was surprisingly good, not only in number, but in sustained interest, especially in view of the fact that the convention was extended over four days instead of three as has been usual. The registered attendance was 286 in Cleveland as compared with 244 in Chicago the previous year.

The membership at the time of the Chicago convention in 1920 was 428; at the time of the Chicago convention in 1921, 627; and at the close of the 1922 convention, 873.
Sectional View of Wall Model

AIRDRY
Registered U.S. Patent Office.

The Electric Towel

100% Sanitation, 60% Direct Economy
Built Into the Job

AIRDRY, the Electric Towel, dries the hands and face Nature's way—by evaporating moisture with a soft warm breeze. AIRDRY is 100% sanitary; no towels necessary, no laundry expense. The drawing above depicts the neatness and simplicity of an AIRDRY Recessed Wall installation. Sanitation and economy are "built-in" with the job.

Over 600 of America's best-known Banks, Office Buildings, Stores and Universities are users of AIRDRY. Their figures show actual savings of more than 50%.

Specify AIRDRY and bring this everlasting sanitation and economy to your clients. Definite comparisons of costs and savings will be forwarded to interested Architects and Builders upon request.

Two Models—Pedestal and Wall

AIRDRY CO. OF CALIFORNIA
155 Montgomery Street, San Francisco

When writing to Advertisers please mention this magazine.
The committee on Concrete Roads and Pavements, Mr. Clifford Older, chairman, Mr. C. R. Ege, secretary, presented through Mr. Ege a discussion of the existing situation in which the concrete road builders find themselves unable to make definite recommendations as to changes in standards for concrete road construction owing to a number of important tests and investigations which are still incomplete. Revised standards are very much needed and this will probably loom as the big job for Committee S-6 in the present year.

Mr. George A. Sherron, presented excellent moving pictures of concrete road construction, showing modern plant methods and equipment.

Mr. A. B. Cohen, Chairman Committee S-2, Reinforced Concrete Highway Bridges and Culverts, selected for the subject matter of the committee’s report the problems of waterproofing, expansion joints, construction joints and drainage in connection with bridge work. The committee expressed the belief that the embodiment of good practice is not confined to theoretical economies based upon actual quantities of concrete, steel reinforcement and other materials, and that the surety of a positive water repellant protection, the development of an effective expansion joint, the determination and arrangement of construction joints that will not weaken the structure nor exceed the capacity of a plant layout commensurate with the magnitude of the work, and finally the distribution of a drainage system to downspouts, are subjects of equal importance.

Commenting on one phase of the convention “Concrete” says editorially:

There is almost overwhelming testimony from concrete building contractors that the proposal of the Joint Committee to permit the specification of concrete by strength is unworkable with our present knowledge and field control. There is also a seeming disregard of the predicament of the engineer who is trying to design a building economically and safely, when he can’t rely within 500 to 1000 lbs., upon the contractor’s ability to deliver a building whose structural members may not test up to requirements.

There are unquestionably matters of the economical field control of concrete proportioning, mixing, placing and curing which would put the builder under a severe handicap, making lawsuits almost a certainty, if he had to guarantee say 2000 lbs. strength on twenty-eight day tests. The contractors point to thousands of their buildings which are entirely satisfactory and rest their case largely on that and the fact that the results from test cylinders under test
INTRODUCING

Richmond Rug Brick

The Richmond Pressed Brick Company is now manufacturing Rug Brick at its Richmond plant. These have been classified into two groups or colors, but they may be had in individual shades and colors, to meet the particular requirements of Architects and Owners.

Richmond Red Rugs
The texture of Richmond Red Rug Brick overcomes the objection of many people to the red brick of the past and affords a beautiful color and tone, yet subdued and restful.

Richmond Buff Rugs
For light Grey or Buff effects, there is just enough variation in shade to relieve the monotony. Various colors and effects can be produced by the selection and mingling of individual shades.

The texture of Richmond Rug Brick is such that a wall of these brick is not unlike an oriental rug in which the colors blend but change as the light strikes it from various angles.

Richmond Rug Brick should appeal to Architects and Owners desiring “something different” from the ordinary run of face brick, and we will appreciate an opportunity of submitting samples.

Richmond Pressed Brick Co.
Manufacturers
Sharon Bldg., San Francisco, Cal.

United Materials Company
Distributors
Sharon Bldg., San Francisco, Cal.
conditions imposed are not truly indicative of strength in the building.

The fundamental situation remains the same; what is the use of accurate design which is to be executed by inaccurate construction? A kind of keynote in the discussion, which lasted all through the last day of the Institute’s Cleveland convention, was sounded by Ernest Ashton when he put the matter up to the contractors like this:

“I note that most of those who have discussed this matter view with considerable alarm and apprehension the great variation existing in concrete test special; I wonder whether the same alarm and apprehension the concrete that they now have in structures—where there was very little or no control?”

Rural Landscapes Futuristic Nightmare

Speaking of advertising signs along highways, Mr. A. R. Hirst, State Highway Engineer of Wisconsin says: “Heaven knows there are enough avenues of publicity open to those who wish to sell their goods without making our rural landscapes a futuristic nightmare.”

The State and counties, by legislation, can keep advertising signs off the highways rights of way, but only public opinion, probably, can stop the desecration of the landscape. If an outraged public would boycott advertisers who persist in disfiguring nature with commercial display, the practice would soon cease. Protection of natural beauty should be inculcated at schools so the next generation will be possessed of an aesthetic sense that will refuse to countenance such practices.

Unsightly Bill Boards

Vigorous protest against further marring the beauty of American highways and interfering with the safety of motor travel by obstructing the view of the tracks in the vicinity of grade crossings with large advertising signs was voiced in a resolution adopted at the late convention of the Asphalt Association, the national organization of paving producers and contractors.

Bearing in mind a severe criticism of the dangerously narrow width of American roads uttered by Mr. Joseph D. Draney, president of the Association, in his annual address, the convention also adopted a resolution urging a minimum width for highways serving large cities of twenty-four feet so as to afford more room for the increasing traffic. “I have ridden over more dangerous roads in the vicinity of New York,” said Mr. Draney, “than one will find, for instance, in the whole of England.”
WILSON
Standard for Forty-Six Years
Sectionfold and Rolling PARTITIONS
"One Room Into Many—Many into One"
FOR CHURCHES, SCHOOLS, OFFICES, Y. M. C. A. BUILDINGS, HOTELS, CLUBS AND OTHER PUBLIC INSTITUTIONS
Easy and instant subdivision of large rooms. Harmonize perfectly with interior decorations. Prices reduced.
Specifications in Sweet's Catalogues
Write for Illustrated Booklets
THE J. G. WILSON CORPORATION
Pacific Coast Office and Factory
621 North Broadway, Los Angeles, Calif.

When writing to Advertisers please mention this magazine.
SECO D. F. PUSH
BUTTON PANEL BOARDS
AND SWITCHES

A high class installation for theaters and public buildings that means efficiency in electrical control.

Photograph shows switchboard with door and trim removed

Also Manufacturers of

safety Panels, Safety Controls, Cut Outs, Cabinets, Knife Switches, Switch Parts, Electric Appliances and Specialties

Safety Electric Company
Samuel H. Taylor, Proprietor

SECO

59 Columbia Square
San Francisco

Kewanee Boiler Company Establishes Factory Branch

The Kewanee Boiler Company, manufacturers of Kewanee boilers built for thirty-five years have established direct San Francisco and Los Angeles factory branches in order to better serve their customers. The San Francisco office is at 216 Pine street (Exposition building) and is in charge of Mr. C. U. Martin who has been selling Kewanee products in California for twenty years or more. Mr. Martin also has full supervision of the Los Angeles office which is at 420 East Third street. Until recently Mr. Martin was actively interested in the management of the California Hydraulic Engineering & Supply Company, in fact he is still vice-president of the company.

During twenty-two months of the War the Kewanee Boiler Company shipped to the Government alone over 22,000 boilers, tank heaters and garbage burners, all of their own manufacture, and although this increase in business necessitated large extensions of the plant, which now occupies over 32 acres, their recovery from the after war depression in business has been really remarkable. Recent advices from the factory are that the plant is working full time with over 1100 men on the pay roll.

The Kewanee plant is the largest plant devoted exclusively to the manufacture of steel boilers and radiators in the United States. They commenced building steel boilers thirty-five years ago, and have grown to their present size by specializing on steel heating boilers.

Takes New Name

The Wayne Tank & Pump Company is the name under which the Wayne Oil Tank & Pump Company will operate in the future, according to an announcement of Mr. Chas. E. Pask, advertising manager of the company. The change in name was found advisable in view of the recent purchase of the Barromite Company of America by the Wayne Oil Tank & Pump Company, Port Wayne, Indiana.

Phone Douglas 3775

United Alloy
Steel Corporation
STARK DIVION
Canton, Ohio

Black and Galvanized Sheets
in San Francisco Warehouse

S. F. SALES OFFICE:
Carl Schulz  Sales Engineer
Santa Fe Building  San Francisco
An Attractive New Wall Bed

With the return to San Francisco of Mr. Gordon F. Cane, president and general manager of the California Wall Bed Company, formerly the American Automatic Lock & Lift Company, announcement is made that the firm intends to broaden its scope of operation to include the entire United States and Canada. Mr. Cane believes that with the improvements that have been made to California Wall Beds, the future of his company is most promising. Agencies are now being established in all the principal cities in the United States and Canadian territory and besides the San Francisco factory, arrangements have been made with the Simmons Bed Company of Kenosha, Wisconsin, to manufacture the beds to take care of the Eastern business.

One great advantage of the “California” bed is the comparatively small space required for its installation. But sixteen inches depth of closet room is required for the bed, and when the bed is up there are two very handsome French doors which add beauty and spaciousness to the room. These French doors are pivoted in the center and may be swung around at the slightest touch. When the bed swings into the room there is an opening of sixteen inches to the closet. The closet may be entered when the bed is down by moving the latter to one side or to the other. All attachments are under-slung. There is nothing to catch or tear mattresses or bed clothing. The bed is equipped with both head and foot frames which give it the appearance of a real piece of furniture when down. When the bed is closed these frames are brought over the bed clothing and act as a tie instead of the old-fashioned steel clamps which tear and muss the bed clothing. The “California” offers a great variety of styles in both square and round tubing which please both architect and client. Many methods of installing beds may be seen at their showrooms, where both architect and client are welcome.

The company’s main office and salesrooms are at 714 Market street, San Francisco, with salesroom and factory at 165 13th street, Oakland. Officers of the company are: President and manager, Gordon F. Cane; vice-president, A. V. Clark of N. Clark & Sons, secretary and treasurer, George Bennett, formerly of Bennett Bros. Hardware Company.

State of California,
County of San Francisco,

ss.

Before me, a Notary in and for the State and county aforesaid, personally appeared W. J. L. Kierulf, who, having been duly sworn according to law, deposes and says that he is the manager of THE ARCHITECT AND ENGINEER, Inc., and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management (and if a daily newspaper publication, the circulation), etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in section 443, Postal Laws and Regulations, printed on the reverse of this form, to wit:

1. That the names and addresses of the publisher, editor, managing editor, and business managers are:
   Name of Post Office Address
   Publisher: W. J. L. Kierulf, 627 Foxcroft Bldg., San Francisco.
   Editor: F. W. Jones, 627 Foxcroft Bldg., San Francisco.
   Business Manager: W. J. L. Kierulf, 627 Foxcroft Bldg., San Francisco.

2. That the owners are: (Give names and addresses of individual owners, or, if a corporation, give its name and the names and addresses of stockholders owning or holding 1 per cent or more of the total amount of stock.)
   W. J. L. Kierulf, 627 Foxcroft Bldg., San Francisco.
   F. W. Jones, 627 Foxcroft Bldg., San Francisco.
   L. B. Penhorwood, 627 Foxcroft Bldg., San Francisco.

3. That the well known bondholders, mortgagees, and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages, or other securities are: (If there are none, so state.)
   None.

4. That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by him.

5. That the average number of copies of each issue of this publication sold or distributed, through the mails or otherwise, to paid subscribers during the six months preceding the date shown above is 1,300.
   (This information is required from daily publications only.)
   W. J. L. KIERULFF, President.

Sworn to and subscribed before me this 25th day of March, 1922.

A. W. HEALEY,
Notary Public in and for the City and County of San Francisco, State of California.

My Commission expires August 29, 1923.

When writing to Advertisers please mention this magazine.
QUALITY FIRST!

The Hajoca Label has and always will be a symbol of quality ware. Under no circumstances will we ever sell "seconds".

Haines, Jones & Cadbury Co.
Makers of Plumbing Supplies
857-859 Folsom Street, San Francisco
Philadelphia-New York-Richmond, Va.-Savannah
Jacksonville-Charlotte

When writing to Advertisers please mention this magazine.
Builders

ARE you in the market for WIRE NAILS?

It will pay you to submit your specifications to us.

We are carrying a large warehouse stock and can quote for mill shipment.

Inquirers will receive prompt attention

EDW. L. SOULE CO.
RIALTO BUILDING
SAN FRANCISCO

What Does It Mean to You
—when a manufacturer trade marks his product?

It means this—

He is maintaining QUALITY standards—standing squarely behind his products—protecting you and himself from inferior merchandise.

When specifying hardwood, say

"BATAAN" MAHOGANY

THE MARK BATAAN OF QUALITY

Lumber, Veneers, Plywood Panel
Hardwood Flooring

CADWALLADER-GIBSON COMPANY
234 Steuart Street
San Francisco, Calif.

Kewanee Boilers—built for 35 years—

Insure Your Building

Against Loss From

Insufficient Heat

They are conservatively rated and guaranteed for heavy overload

Interrupted Heating Service

They are All Seel, riveted throughout, no sections to break

Excessive Fuel Bills

They are 75 to 81% efficient

Tabasco All-Steel Water Heaters

Built like High Pressure Boilers
For Domestic Hot Water and for Heating Residences and Green Houses

For your service KEWANEE BRANCHES now at

San Francisco
216 Pine Street
Kewanee Boiler Company
Los Angeles
420 East 3rd Street

When writing to Advertisers please mention this magazine.
You Can Help End This Needless Waste!

Anyone having anything to do with installation of plate glass in store fronts should be appalled by the figures which show how many millions of dollars are paid out yearly because of breakage. The greater part of plate glass breakage is due to faulty setting. There would be some excuse for this needless waste if there were no remedy. But plate glass breakage may be largely avoided by making the following a part of all store front specifications:

Glazing Specification

All Metal Sash, Corner Bars, Division Bars and Self-Adjusting Setting Blocks Used in Store Fronts Must Be Listed by the Underwriters’ Laboratories

How much longer must insurance companies—and the store owners, too—be made to pay for faulty construction? It is partly up to you to decide—the remedy rests largely in your hands.

All Zouri Key-Set Sash, Corner Division Bars and Self-Adjusting Setting Blocks have been listed by the Underwriters’ Laboratories.

Ask either of the firms listed below for full particulars of Zouri Construction

COBBLEDICK-KIBBE GLASS COMPANY
Oakland and San Francisco

CALIFORNIA PAINT & GLASS CO.
Los Angeles, California

Zouri Drawn Metals Company
Factory and General Office
1632 EAST END AVENUE CHICAGO HEIGHTS, ILLINOIS

When writing to Advertisers please mention this magazine.
BOOK REVIEWS
Edited by AUGUST G. HEADMAN, Architect

COMMUNITY BUILDINGS FOR INDUSTRIAL TOWNS—Community Service, One Madison Avenue, New York, price 75c. A series of twelve Bullets devoted to discussions of the various phases of the Memorial Building Movement are available through Community Service without charge.

The industrial center club building is not a new idea either in this country or in Europe, but there are strong present day tendencies in such buildings which are a definite post-war development. How marked these tendencies have become may be observed by a study of "Community Buildings for Industrial Towns," a publication just issued "to meet the needs of a large number of industrial organizations, individuals and communities."

This publication, the result of studies of the whole field made during 1921, is largely a discussion of some carefully chosen examples of such buildings from the standpoint of architecture, administration and scope of activities. There are conclusions to be drawn from it which cannot fail to interest the local architect. Notably; there is a large and steadily increasing demand for industrial center buildings; these buildings, even when financed solely by the industry, must be broadly democratic in their appeal; they must be so planned as to interest people of all ages and of both sexes.

Even the earliest forms of "welfare clubs" provided within industrial establishments are found to have gradually become democratic in their control, and are being remodeled, enlarged, or replaced often by the workers or by an intra-works organization representing the employers and the employed. The latter, no less than the former, have "come to realize more fully the significance of recreational activities which identify the worker with community life. The community house, where the worker in his leisure hours meets the people of the neighborhood who may or may not be associated with him in the industry, helps to provide an outlet, for the normal instincts of sociability and companionship."

Those responsible for the newest and most distinctive developments in industrial center social buildings have been noticeably alert in incorporating into them just those features which have contributed most to the success of the memorial community buildings of the country. While nothing approximating a standard of community house architecture has developed to date, a study of the World War "memorials of democracy" the country over will show that there is a well defined minimum of requirements for the building of a given type. These requirements, adapted to the situation under discussion, are admirably set forth in "Community Buildings for Industrial Towns" in the form of full floor plans for three buildings ranging in price from $45,000 to $275,000. (Jallade, Lindsay and Warren, architets, 129 Lexington avenue, New York).

It goes without saying that the local situation demands of the architect as well as of the industrial heads or of the local building committee, a knowledge of the most modern developments in social buildings. It may be added, that it demands as well at least some degree of social mindedness on the part of the architect if these buildings in the aggregate are going to develop into something really fine, into a genuine contribution to the social life of America. If the auditorium, for instance, is successful as a gymnasium, it will inevitably develop an enthusiasm for indoor sports which will demand exclusive gymnastic facilities. Bowling alleys, a swimming pool, a running track. "To whom but to the architect would it occur that even the choice of the building site should be such as to permit of additions to the building or future excavation for a basement floor?"
From Coast to Coast
WESTERN
VENETIAN BLINDS
are satisfactorily serving hundreds of modern banks, office buildings, schools, etc.

Let us send you illustrated booklets and general details and specifications
Phone Sutter 2646
Builders' Exchange, San Francisco
Quarries, Rocklin and Porterville
Main Office: Rocklin, Placer Co., Cal.
Telephone Main 82

RALPH E. DODGE
CIVIL ENGINEER.
Bridges and Special Structures of Reinforced Concrete and Steel
Structural Designs for Buildings
Supervision of Construction.
Telephone Kearny 1783 San Francisco, Calif. 251 Kearny Street

CHAS. STOCKHOLM & SONS
GENERAL CONTRACTORS
849 MONADNOCK BUILDING Phone DOUGLAS 4637 SAN FRANCISCO

Hot Water Electrically
ALL YOU WANT
ALL THE TIME
THERM-ELECT WATER HEATER for APARTMENT HOUSES
ELECTRIC SALES SERVICE COMPANY
2532 Sixth Street, BERKELEY
Phone Berkeley 3070

JOHN M. BARTLETT
GENERAL CONTRACTOR
Office Phone Lakeside 8750
357 - 12th ST. OAKLAND Res. Phone Berkeley 6884W

LARSEN-SIEGRIST CO., Inc.
BUILDING CONSTRUCTION
807 Claus Spreckels Building SAN FRANCISCO

LAWTON & VEZEY
CONTRACTORS AND BUILDERS
332 CALL BUILDING 306 PLAZA BUILDING
SAN FRANCISCO OAKLAND

L. J. RUEGG J. B. RUEGG
RUEGG BROS.
CONTRACTORS AND BUILDERS
Phone Douglas 1599 California Commercial Union Bldg., San Francisco

When writing to Advertisers please mention this magazine.
Hibernia National Bank Building
New Orleans, La.
Architects,
Favrot & Livaudais
Builders,
George A. Fuller Company
New York
Metal Windows and Skylights of "Armco" Ingot Iron

Only iron that is pure should be specified for

1. Outside sheet-metal work
2. Interior sheet-metal work, such as heating and ventilating ducts
3. Metal lath and partitions
4. Window frames and rolling doors

Pure iron resists rust, while iron or steel containing impurities rusts quickly. "Armco" Ingot Iron is as near a pure iron as can be manufactured in commercial quantities. The impurities which in steel promote corrosion are almost completely eliminated. "Armco" Ingot Iron contains less than one-fifth of one per cent of these impurities.

Our bulletin, "On the Necessity for Pure Iron in Certain Applications," should be in every architect's files. We shall be glad to send it to you upon request.

THE AMERICAN ROLLING MILL CO., Middletown, Ohio

Pacific Coast Sales Office, Tenth and Bryant streets, San Francisco. Other branch offices in New York, Chicago, Pittsburg, Cleveland, Detroit, St. Louis, Cincinnati, Atlanta, Washington, D. C., and Buffalo.

ARMCO INGOT IRON

When writing to Advertisers please mention this magazine.
A Lesson in Economy

After the failure of the original wheel hangers
Reliance-Grant Ball-Bearing Elevator Door Hangers were placed in the following buildings:

Wells Fargo National Bank Bldg. San Francisco
Orient Bldg. San Francisco
First Natl. Bank Bldg. San Francisco
Wiltshire Hotel San Francisco
I. Magnin Bros. San Francisco
Gantner & Mattern Bldg. San Francisco
Kohl Bldg. San Francisco
Realty Syndicate Bldg. Oakland

In all of these cases the saving of a few dollars in the cost of the original installation by the use of an inferior product proved in the end to have been a loss.

Manufactured by

Reliance-Grant Elevator Equipment Corporation
Park Avenue and 40th Street, New York
PACIFIC COAST AGENTS

Look for this Trademark And if it's there don't worry any more about your Valves and Fittings

Specify and insist upon having

The Kelly & Jones Co. Valves and Fittings
Byers Genuine Wrought Iron Pipe
Republic Steel Pipe

California Steam & Plumbing Supply Co.
671-679 Fifth Street, Corner Bluxome
SAN FRANCISCO CALIFORNIA
AEROPLANE VIEW OF SHELL OIL COMPANY'S EMPLOYEES' COTTAGES
AT MARTINEZ, CONTRA COSTA COUNTY

HOOSIER CABINETS

and Peerless Built-In-Furniture

were specified and used in these model California homes

Hoosier Cabinets and Peerless Built-in-Furniture saves space, time, money and worry.

THE HOOSIER STORE

O. K. BROWN

Pacific Building, San Francisco

When writing to Advertisers please mention this magazine.
THE TORMEY CO.

General Painters
Phone Franklin 5-5-9-8
1042 Larkin St., San Francisco, Cal.

Alvaline, Cementoline
and other
Jones-Duncan Products
MAGNER BROTHERS
PAINT MAKERS
Telephone: Market 113
414-424 Ninth St. San Francisco

HEATING-PLUMBING
COMPLETE PLUMBING AND
HEATING SYSTEMS INSTALLED IN ALL CLASSES OF
BUILDINGS—ALSO POWER PLANTS
GILLEY-SCHMID CO., Inc.
198 OTIS ST., SAN FRANCISCO
Tel. MARKET 965

"BLAZING" THE TRAIL
We've been doing it for many years—
giving the Sportsman Better Value for
Quality than he ever before received.
"Value at a Fair Price" in everything for
the Sportsman.

Phone Douglas 3224

Hunter & Hudson
ENGINEERS
Designers of Heating, Ventilating
and Wiring Systems, Mechanical
and Electrical Equipment of
Buildings
703 Rialto Bldg., San Francisco, Cal.

BEAVER BLACKBOARD
BEAVER GREENBOARD
SCHOOL FURNITURE
AND SUPPLIES—
OFFICE, BANK AND
COURTHOUSE FURNITURE—
THEATRE AND
AUDITORIUM SEATING
Rucker-Fuller Desk Co.
677 Mission St., SAN FRANCISCO, CAL.
432 - 14th Street - OAKLAND, CAL.

Pittsburg
It Insures
Instant
Hot Water
Service
PITTSBURG WATER HEATER COMPANY
478 Sutter S., San Francisco
Phone Sutter 5025

RUSSWIN
BUILDERS' HARDWARE
JOOST BROS., Inc.
SAN FRANCISCO AGENTS
We Carry Complete Stock:
Fishing Tackle—Guns—Mechanics' Tools—
Paints—Crockery and Glassware—Stoves—
Household Goods. Telephone Market 891.

NO BRANCH STORE
Mazda Lamps Electric Goods
This TRADE MARK means much to the conscientious Architect and Builder

It is a guarantee that the client will be satisfied

HOLBROOK, MERRILL & STETSON
HIGH-GRADE PLUMBING FIXTURES

64 Sutter Street
San Francisco

WHY?
The increased demand for these fittings during the past several months, prove that the leading Architects ask for them in their specifications on new buildings.

Approved by Boards of Health in Leading Cities

Victory Manufacturing Co.
Monadnock Bldg.
SAN FRANCISCO, CALIF.
Factory:
NILES, CALIF.
A. D. COLEMAN

COLLMAN AND SPEIDEL
GENERAL CONTRACTING
Telephone SUTTER 4858
MONADNOCK BUILDING, SAN FRANCISCO

I. R. KISSEL
Decorator, Painter and Paperhanger
1747 SACRAMENTO ST., Bet. Polk St. and Van Ness Ave., SAN FRANCISCO

ROBERT TROST
General Building Contractor
PHONE MISSION 2209
We Specialize in High Grade Work and Employ Skilled Labor in every Branch of the Building Industry.
26th and Howard Streets
SAN FRANCISCO

P. A. PALMER
Contracting Engineer
782-796 Monadnock Building
SAN FRANCISCO, CAL.

LOUIS FONTANELLA, Phone Mission 8923
MARK TEZA, Phone Valencia 1623
FONTANELLA & TEZA
General Contractors
Telephone West 1285
1682 Eddy Street, San Francisco

MONSON BROS.
Building Construction
Yard
Mariposa and Bryant Streets
Phone Market 2963
251 Kearny Street, San Francisco
Telephone Douglas 6619

UNIT CONSTRUCTION COMPANY
(INCORPORATED)
ENGINEERING AND CONSTRUCTION
Telephone Kearny 28
429-36 Phelan Building, SAN FRANCISCO

J. D. HANNAH
Contractor and Builder
Office: 142 Sansome Street
San Francisco, Cal.
BUILDERS EXCHANGE, 180 JESSIE STREET
Telephone Douglas 3885

When writing to Advertisers please mention this magazine.
Advise your clients to purchase their rugs and carpets from us.

They will thank you for the advice.

Our rugs and carpets are of the very best quality, and our prices are guaranteed to be the lowest in San Francisco.

EDW. J. MARGETT
Wholesale Jobber
61 Ellis Street
Phone Douglas 2253
Opposite Century Theater

CLINTON
WELDED WIRE FABRIC and LATH
L. A. NORRIS CO.
140 Townsend Street
Phone Kearny 5375 San Francisco

ROBERTS MFG. CO.
Lighting Fixtures
Electric Appliances
Incandescent Lamps

THOMAS DAY CO.
Lighting Fixtures
SAN FRANCISCO
OAKLAND
LOS ANGELES
SACRAMENTO
SALT LAKE CITY

WILLYS FARM LIGHTING AND POWER PLANTS
663 Mission Street San Francisco

When writing to Advertisers please mention this magazine.
245 Market St.  
Standard Fence Co.  
WIRE AND IRON WORKS
316 12th Street, OAKLAND  
Tel. Oakland 475
DESIGNERS—BUILDERS  
HOME AND ESTATE FENCE  
AVIARY and TENNIS COURT FENCE  
320 North Los Angeles Street, Los Angeles, Cal.  
WIRE GRILL WORK—WIRE SCREEN  
FLEXIBLE WIRE CONVEYOR BELT  
WIRE SPECIALTIES  
Phone 67188

Steel Bars  
FOR CONCRETE REINFORCEMENT  
Cut to Length, Fabricated, Installed  
Tel. Douglas 3466  
BADT-FALK & CO.  
346 Call-Post Bldg., 74 New Montgomery St., San Francisco

THE HERMANN SAFE CO.  
Manufacturers of Fire and Burglar Proof Safes, Vaults and Safe Deposit Boxes  
Also Representatives for the YORK SAFE & LOCK CO. OF YORK, PA.  
216-224 Fremont Street, San Francisco, Cal.

MARTEN & FREDERICK  
UNITED WORK SHOPS  
Designers, Makers and Contractors of  
FINE FURNITURE, DRAPERIES and COMPLETE INTERIORS  
Phone FRANKLIN 689  
1374 SUTTER STREET, SAN FRANCISCO

GRIFFIN SHEET METAL WORKS  
1720 H STREET, FRESNO, CALIFORNIA  
Heating and Ventilating Contractors  
STEAM TABLES AND KITCHEN EQUIPMENT

Res. Tel. Merritt 3660  
HERBERT BECKWITH  
Building Construction  
Formerly with ARTHUR ARLETT  
Everson Building  
OAKLAND

D. ZELINSKY & SONS  
PAINTERS AND DECORATORS  
420 TURK STREET, SAN FRANCISCO

CHARLES T. PHILLIPS  
CONSULTING ENGINEER  
PACIFIC BUILDING  
HEATING, VENTILATION, WIRING, ILLUMINATION
PACIFIC HEATING COMPANY
Geo. T. Fletcher
Geo. P. Schmitt
E. L. Fletcher

Heating, Ventilating and Sheet Metal Work
Coal, Wood, Oil and Gas Heaters to Meet all Requirements
We Repair All Makes of Heating Appliances
WORK GUARANTEED
Oakland 388  Corner Second and Grove Streets, OAKLAND CALIF.

Atlas Heating and Ventilating Co., Inc.
ENGINEERS and CONTRACTORS
STEAM AND HOT WATER HEATING, FANS, BLOWERS
FURNACES, POWER PLANTS—SHEET METAL WORK
Phone Douglas 378
Fourth and Freelon Sts., Bet. Bryant & Brannan, SAN FRANCISCO

CLARENCE DRUCKER
LAWSON & DRUCKER
PLUMBING—HEATING—CONTRACTORS
450 HAYES STREET
TELEPHONE MARKET 275
SAN FRANCISCO, CAL.

FLOOR AND WALL TILING
SCOTT CO., INC.
243 MINNA STREET
SAN FRANCISCO

ALEX COLEMAN
CONTRACTING PLUMBER
706 ELLIS STREET, SAN FRANCISCO
Phone FRANKLIN 1006

WM. F. WILSON COMPANY
MODERN SANITARY APPLIANCES
Special Systems of Plumbing for Residences, Hotels, Schools, Colleges, Office Buildings, Etc.
Phone Sutter 357
328-330 Mason Street, San Francisco

W. H. PICARD
Picard & Edwards
Heating, Ventilating and Power Plants
5664 College Avenue  Piedmont 7522  Oakland, Calif.
5662 Keith Avenue

CARL T. DOELL
PLUMBING
467 21st Street, Oakland, California
Heating
Telephone Oakland 3324

When writing to Advertisers please mention this magazine.
VENTILATION, COOLING, DRYING AND HEATING

requires not only correct type of air equipment, but must be properly applied.
Our Engineering Department will gladly submit recommendations for the solution of your problems without obligating you in any way.

Western Representatives:

ILG ELECTRIC VENTILATING CO.

Tiltz Engineering & Equipment Co.

SAN FRANCISCO
479 Monadnock Building
Phone Sutter 2348

LOS ANGELES
512 Wright & Callender Bldg.
Phone Automatic 66464

CAST IRON STAIRS AND STORE FRONTS

Bank and Office Railings, Elevator
Enclosures and Fire Escapes

C. J. HILLARD & CO., Inc.

Nineteenth and Minnesota Streets
Telephone Mission 1763
SAN FRANCISCO, CAL.

George S. MacGruer / Members of Builders Exchange
Robert M. Simpson

MacGruer & Simpson

CONTRACTING PLASTERERS
PLAIN AND ORNAMENTAL

Cement, Stucco and Artificial Stone

Phone Garfield 512
266 Tehama Street, San Francisco

When writing to Advertisers please mention this magazine.
Passenger and Freight Elevators
Made in San Francisco
Factory and Office: 166-180 Seventh Street
SAN FRANCISCO
Phones: Market 1534 and 1535

JAS. I. KRUEGER
Representing
Illinois Engineering Company, Chicago
Eureka Brass Works, Cincinnati

Manufacturers of
Vacuum and Vapor Steam Heating Materials, Power Plant Equipment
Standard Radiator and Gate Valves, Pumps for Vacuum Systems of Heating

557-559 Pacific Building, San Francisco
Telephone Sutter 7037

RAYMOND GRANITE COMPANY, Inc.
Owning and operating at Knowles, Madera County, the largest Quarry in the world
CONTRACTORS FOR STONE WORK

Designers and Manufacturers of Exclusive Monuments and Mausoleums
Main Office and Yard: No. 1 and 3 Potrero Avenue, San Francisco, California
Also at 1850 Palmetto Street, Los Angeles

CYCLOPS IRON WORKS
ICE MAKING and REFRIGERATING MACHINERY, TRAVELING CRANES
Office and Works: SAN FRANCISCO, CAL.
837-847 FOLSOM ST.
Telephone: SUTTER 3030

GRINNELL AUTOMATIC SPRINKLER
GRINNELL COMPANY
OF THE PACIFIC
VALVES
ENGINEERS AND CONTRACTORS
PIPE and FITTINGS
453 Mission Street, San Francisco
CHEMICAL FIRE
EXTINGUISHERS
and FIRE ENGINES
Marshall & Stearns Portal Wall Beds will help keep down the cost where limited space is a building factor in Apartments and Residences.

Conserve Space

Marshall & Stearns Co.
Wall Beds
Highest Awards Always
SAN FRANCISCO    OAKLAND

Carey
BUILT-UP ROOFING

The Jones Brothers Asbestos Supply Company, Inc., have been appointed Distributors for the Philip Carey Company of Cincinnati, Ohio, for California and Nevada.
PIPE AND BOILER COVERINGS
ASBESTOS ROOFING
ELASTITE EXPANSION JOINTS
CAREY FIBRE ROOF COATING
ASFALTS/SLATE SHINGLES

A Complete Stock of All Asbestos and Magnesia Products Carried in San Francisco

JONES BROTHERS ASBESTOS SUPPLY COMPANY, INC.
512 Second Street, San Francisco
Telephone, Garfield 156

When writing to Advertisers please mention this magazine.
POSITIVE ELECTRIC INTERLOCK
(BAR LOCK TYPE)
Prevents Elevator Accidents Occurring at the Entrance Door
Approved by National Underwriters Laboratories—Meets requirements of Elevator
Safety Orders of Industrial Accident Commission, State of California

ELEVATOR SUPPLIES COMPANY, Inc.
186 FIFTH STREET
SAN FRANCISCO

Capital $2,000,000
CALIFORNIA DEPARTMENT
Surplus $2,250,000

THE FIDELITY AND CASUALTY COMPANY OF NEW YORK
Prompt Service for
BONDS AND CASUALTY INSURANCE
BALFOUR BUILDING
SAN FRANCISCO, CAL.

National Surety Company of New York
The World's Largest Surety Company
Assets over $20,000,000
Pacific Coast Department: 105 MONTGOMERY ST., SAN FRANCISCO, CAL.
Frank L. Gilbert, Vice-President
Phone, Sutter 2636

PACIFIC DEPARTMENT
GLOBE INDEMNITY COMPANY
Bonds and Casualty Insurance for Contractors
FRANK M. HALL, formerly Robertson & Hall, Mgr.
444 California Street
Phone Sutter 2280
SAN FRANCISCO

PHONE DOUGLAS 2370

R. McLERAN & CO.
GENERAL CONTRACTORS
HEARST BUILDING
SAN FRANCISCO, CAL.

Phone Sutter 1533

ALFRED H. VOGT
GENERAL CONTRACTOR
CONCRETE CONSTRUCTION
185 Stevenson Street, San Francisco

J. F. WAYNE
Phone Fillmore 1856

Wayne & Williams
PAINTERS and DECORATORS
PHONE MARKET 3427
1621 EDDY STREET
SAN FRANCISCO

R. C. WILLIAMS
Phone Market 3427

PACIFIC ELECTRIC CLOCK CO.
J. J. Estabrook
Manufacturers and distributors of Electric Clock Systems and Time Keeping
Devices for Schools, Public and Private Buildings. Plans and Specifications
prepared by competent engineers without charge.
711, 717 WELLS FARGO BLDG.
SAN FRANCISCO, CALIF.
The Elevator Floor

Whether in Office Building, Hotel or Department Store, is subjected to a great deal of wear and tear.

—Specify—
INTERLOCKING RUBBER TILING

And you've provided your client's building with a durable, economical, practical material that is sure to give satisfaction. Twenty tons installed in the Standard Oil Building, San Francisco.

Stock on hand for immediate delivery.

NEW YORK BELTING AND PACKING CO.
NEW YORK
San Francisco Branch 519 MISSION ST. Phone Douglas 1837
Small booklet of designs mailed on request

Specify BOWSER

The latest Bowser Piston-Type Measuring Pump (illustrated) is either hand or air-driven and exemplifies the high standard of service set by Bowser Equipment.

The motive power being air, the usual fire hazard in handling gasoline by power is eliminated.

Bowser Equipment accurately, economically and safely meets all requirements for gasoline and oil storage and service.

Whether it is in a garage, railroad, factory or dry cleaning plant, you are best serving your clients when you specify Bowser Equipment.

Write for Illustrated Booklet A-03

S.F. BOWSER & COMPANY, Inc.

1303 CREIGHTON AVE., FORT WAYNE, INDIANA
Sales Offices (with Service Departments) throughout the United States and in Principal cities of the World.

612 Howard Street
San Francisco, Calif.

1225 So. Olive Street,
Los Angeles, Calif.

LONDON PARIS HAVANA SYDNEY

When writing to Advertisers please mention this magazine.
MORTENSON CONSTRUCTION CO.
CONTRACTORS FOR STRUCTURAL STEEL AND IRON
H. MORTENSON, President
Office and Shops: Corner 19th and Indiana Streets
Phone: Mission 5033
SAN FRANCISCO, CAL.

JUDSON MANUFACTURING COMPANY
Main Office: 
817-821 FOLSOM STREET
Telephone Sutter 6820
SAN FRANCISCO

Federal Ornamental Iron & Bronze Co.
Bank Counter Screens and Grille Work Our Specialty
Most Modern Equipment Throughout
Recent Contracts: BANK OF ITALY, FIRST NATIONAL BANK
16th Street and San Bruno Avenue, San Francisco
Phone Market 1011

S. S. HERRICK CO.
STRUCTURAL STEEL
BUILDINGS :: BRIDGES :: TOWERS
Office and Works
Foot of Adeline Street
Oakland, Calif.
Telephone Lakeside 1160

CENTRAL IRON WORKS, Inc.
STRUCTURAL STEEL
Office 2050 BRYANT STREET
SAN FRANCISCO, CAL.

C. S. HOFFMAN
L. W. FLIEGNER
Golden Gate Iron Works
STRUCTURAL STEEL AND ORNAMENTAL IRON CONTRACTORS
Howard and 11th Streets
San Francisco

SCHRADER IRON WORKS, Inc.
STRUCTURAL STEEL CONTRACTORS
Fire Escapes, Waterproof Trap Doors, Ornamental Iron Work
1247-1249 HARRISON STREET
Bet. 8th and 9th
SAN FRANCISCO, CAL.
Telephone Market 337

When writing to Advertisers please mention this magazine.
Arden Plaster

Now available in any quantity desired for immediate delivery

For further information call on your dealer

Manufactured by

United States Gypsum Co.

SCHOOL
FURNITURE
AUDITORIUM
SEATING

MAPS
GLOBES
ATLAS

C. F. WEBER & CO.
985 Market Street
SAN FRANCISCO
222-224 S. Los Angeles St.
LOS ANGELES
RENO, NEVADA
PHOENIX, ARIZONA

Make Your CRANE Visit Part of the Plan

The complete resources of CRANE Branches and Exhibit Rooms the country over are at your disposal when you need equipment for any phase of plumbing, sanitation, heating or kindred service.

We are manufacturers of about 20,000 articles including valves, pipe fittings and steam specialties made of brass, iron, ferrosteel, cast steel and forged steel, in all sizes, for all pressures and all purposes, and are distributors through the trade, of pipe, heating and plumbing materials.

CRANE CO.
Plumbing Supplies
Second and Brannan Sts. 348 Ninth Street
San Francisco Oakland

THE HYLOPLATE BLACKBOARD

When writing to Advertisers please mention this magazine.
Western Safety Switches
Manufactured by
Western Safety Man'fg Co., Inc.
Enclosed Externally Operated Safety Switches, Knife Switches, Metal Switch and Cut Out Boxes, Safety Switch Boards
Office, 247 Minna Street
SAN FRANCISCO
Telephone, Sutter 3008

Telephone DOUGLAS 2046
CHARLES FELIX BUTTE
BUTTE ELECTRICAL EQUIPMENT COMPANY
Trade Mark BEECO Registered
ELECTRICAL CONTRACTORS AND ENGINEERS
530 FOLSOM STREET
SAN FRANCISCO

L. SIEBERT
Drendell Electrical & Mfg. Co.
Incorporated
SWITCHBOARDS, PANEL BOARDS, KNIFE SWITCHES,
CABINETS, THEATRE INSTALLATIONS,
PROTECTIVE POWER PLANTS
1345-1353 Howard St., San Francisco
Telephone Market 1753

MEYERS SAFETY SWITCH CO.
MANUFACTURERS OF
Enclosed Externally Operated "Safety" Switches
and Electrical Sheet Metal Products
575 HOWARD ST., SAN FRANCISCO
Telephone Sutter 4213

When writing to Advertisers please mention this magazine.
BUTTE ELECTRIC & MFG. CO.
DOUGLAS 145
RADIO INSTALLATIONS
WIRING FOR BUILDINGS
534 FOLSOM ST., SAN FRANCISCO

H. S. TITTLE
CONTRACTING ELECTRICAL ENGINEER
766 FOLSOM ST., SAN FRANCISCO
Phone SUTTER 1278

To Be "Low Bidder" Not Always Our Aim
"QUALITY AND SERVICE ALWAYS"
Our nation-wide organization and large experience in this field assure you always of fair estimates and absolute satisfaction.

F. E. NEWBERRY ELECTRIC CO.
Office and Show Rooms 359 Sutter St., San Francisco
Phone Sutter 521

San Francisco, Cal. Oakland, Cal. Los Angeles, Cal.

Ne PAGE, McKENNY CO.
Electrical Engineers and Contractors
Phone Sutter 2369
589 Howard St., San Francisco, Cal.

Phone Market 2541

GLOBE ELECTRIC WORKS
Estimates Furnished on Everything Electrical
ELECTRIC SUPPLIES
1959 Mission Street, bet. 15th and 16th
SAN FRANCISCO

Browne-Langlais Electrical Construction Co.
Agents for
ROBBINS and MYERS MOTORS, PACKARD MAZDA LAMPS
313 FIFTH STREET, SAN FRANCISCO
Telephone Douglas 976

ROLPH, MILLS & CO.
SUTTER 1100

149 CALIFORNIA ST.
SAN FRANCISCO

GLASS—Wholesale Only—GLASS

Motors Lighting Fixtures Construction
Bought, Sold, Rented, Repaired Manufactured Maintenance Supplies
SPOTT ELECTRICAL CO.
16TH and CLAY STREETS OAKLAND, CALIFORNIA
MOTT PLUMBING FIXTURES

Architects and their clients are invited to visit our Showrooms, 553-555 Mission Street, San Francisco; D. H. Gulick, Sales Agent. Los Angeles Office, 603 Central Building; J. R. Mayhew, Sales Agent.

MOTT COMPANY OF CALIFORNIA

MUELLER.....
BRASS GOODS

Recognized as the Standard of excellence in plumbing. It pays to use them, and other Mueller Brass Goods. The first cost is practically their last cost.

635 MISSION STREET, SAN FRANCISCO, CAL.

SPECIFY
STORM KING AND
AMERICAN WARM
AIR FURNACES

FURNACE FITTINGS AND REPAIRS

Montague Range and Furnace Company
327-329 JESSIE STREET Phone Garfield 1422
SAN FRANCISCO, CALIF.

Modern Heating Plants...


JAMES A. NELSON
Heating and Ventilating Contractor

Phone, GARFIELD 1959 517-519 SIXTH ST., SAN FRANCISCO

When writing to Advertisers please mention this magazine.
ACORN BRAND OAK FLOORING
for discriminating Architects and Builders, and characteristically
a Tennessee product in every way, from the excellence of the
wood itself to the superior millwork and careful grading.

Strable Hardwood Co. HARDWOOD
LUMBER
PHONE OAKLAND 245
511-545 FIRST STREET OAKLAND, CALIFORNIA

NO GERMS HERE
HAWS IMPROVED SANITARY DRINKING
FAUCET eliminates all possibility of con-
tracting disease from dirty bulbs or unsanitary
bowls. Provided with an overhead cowl, the
drinker's lips never touch the source of supply.
A slanting stream throws the water from right
to left and away from the bubbler, instead of
straight up to fall back over the fountain head.
Recommended for Schools and Public Playgrounds.
A type used extensively by the U. S. Government.
Manufactured by
Haws Sanitary Drinking Faucet Co., Inc.
1808 Harmon Street, Berkeley,
Phone Piedmont 3742

OPEN HEARTH
REINFORCING STEEL BARS
Square Deformed—Immediate Shipment—Cut to required lengths
PACIFIC COAST STEEL COMPANY
Sales Office, Rialto Building SAN FRANCISCO Phone Sutter 1564

"MPCO"
STONE SHINGLES
LIGHT WEIGHT FIREPROOF EVERLASTING
McCLENAHAN PRODUCTS COMPANY INC.
112 Kearny Street

When writing to Advertisers please mention this magazine.
MILLER FOLDING IRONING BOARD
ELIMINATES WALL CABINET—IS INSTALLED IN KITCHEN CUPBOARD
NO PLASTER GROUNDS SAVES WALL SPACE AND LABOR
CASING OR PAINTING TIME AND MATERIAL
Exhibited at LANNOM BROS. MFG. CO
and sold by 362 Magnolia St., Oakland, Calif.

MILLWORK Manufactured and Delivered Anywhere
Plans or Lists sent us for Estimates will have Careful and Immediate Attention
Jno. Dudfield, Pres.
and Manager DUDFIELD LUMBER COMPANY Joseph A. Jury,
Secretary & Mill Supt.
MAIN OFFICE, YARD AND PLANING MILL—PALO ALTO, CALIFORNIA

SCHOOL AND THEATRE
STAGES AND EQUIPMENT
EDWIN H. FLAGG
SCENIC COMPANY, Inc.
400 Pantages Bldg., San Francisco, Cal.
Studios, 1873 Mission Street, San Francisco
1638 Long Beach Ave., Los Angeles, Cal.

A. C. SCHINDLER, President
CHAS. F. STAUFFACHER, Secretary
THE FINK & SCHINDLER CO.
Manufacturers of INTERIOR WOODWORK AND FIXTURES
SPECIAL FURNITURE
218-228 THIRTEENTH STREET
Bet. Mission and Howard Sts.
SAN FRANCISCO, CAL.
Telephone: Market 474

O. BAMANN, President
ERNEST HELD, Vice-President
HOME MANUFACTURING CO.
BANK, STORE AND OFFICE FITTINGS
FURNITURE AND HARDWOOD INTERIORS
CABINET WORK OF EVERY DESCRIPTION
543 and 545 BRANNAN ST. Phone Kearny 1514
San Francisco, Cal.

Mullen Manufacturing Co.
BANK, STORE AND OFFICE FIXTURES—CABINET WORK OF
GUARANTEED QUALITY—CHURCH SEATING
Telephone Market 8692 Office and Factory:
64 Rausch St., Bet. 7th and 8th Sts. San Francisco

JAMES L. McLAUGHLIN
GENERAL CONTRACTOR
Phones Douglas 6645—6646 251 KEARNY STREET, SAN FRANCISCO

Dolan Wrecking & Construction Co.
(D. J. DOLAN)
Lumber, Lath, Nails, Shingles, Doors, Windows
and Plumbing Supplies, New and Second Hand
Phone Market 4264 Office and Yard, 1607-1639 MARKET ST., SAN FRANCISCO

When writing to Advertisers please mention this magazine.
United States
Steel Products Co.

Rialto Bldg., San Francisco


MANUFACTURERS OF
Structural Steel for Every Purpose—Bridges, Railway and Highway—“Triangle Mesh” Wire Concrete Reinforcement—Plain and Twisted Reinforcing Bars—Plates, Shapes and Sheets of Every Description—Rails, Splice Bars, Bolts, Nuts, etc. — Wrought Pipe, Trolley Poles — Frogs, Switches and Crossings for Steam Railway and Street Railway — “Shelby” Seamless Boiler Tubes and Mechanical Tubing—“Americore” and “Globe” Rubber Covered Wire and Cables—“Reliance” Weatherproof Copper and Iron Line Wire—“American” Wire Rope, Rail Bonds, Springs, Woven Wire Fencing and Poultry Netting—Tramways, etc.

United States Steel Products Co.

OFFICES AND WAREHOUSES AT
San Francisco  Los Angeles  Portland  Seattle
OTIS ELEVATORS

The Architect or Engineer can specify "Otis Elevators," assured that the responsibility of the Otis Elevator Company extends beyond satisfactory installation. Buildings equipped with Otis Elevators enjoy the advantage of the prompt service and careful inspection rendered by any of our hundred offices. Such service means your clients' gratitude.

Otis Elevator Company

Offices in all principal cities of the world
2300 Stockton Street
San Francisco, Cal.
One of our dominating monthly newspaper advertisements

Get the best!
The highest quality and the most beautiful designs—guaranteed forever against any defects in workmanship or materials.
Prices no higher than other reputable brands.

Specify
PACIFIC
PLUMBING FIXTURES
FOR SALE BY ALL PLUMBERS

Main Office: 67 New Montgomery Street, San Francisco
Factories: Richmond and San Pablo, California

Look for this trademark on every fixture—it guarantees quality
NATIONAL LEAD CO'S
New Carter Lead Unit
OAKLAND, CAL.
covered with a

PABCO 10 Year Roof

Because of their records of long service, dependability and low cost per year of service—under the most severe climatic conditions, PABCO 10 and 20 Year Roofs are the choice of Western architects, engineers, and industrial concerns. Pabco Roofs are rapidly displacing the old style felt and gravel roofs. Their recognized superiority is due largely to the following outstanding advantages:

1. A complete and definite specification
2. Superior wearing qualities
3. Greater tensile strength
4. Highest grade materials
5. A proved method of construction
6. Low maintenance cost

A $11,500,000.00 concern, and thirty-seven years of experience are behind every PABCO Roof.

Write for specifications, samples and complete details

THE PARAFFINE COMPANIES, Inc.
Seattle, Portland, San Francisco, Los Angeles
Accordian and Folding Partitions have proven their advantage in the subdivision of large rooms. Arrange the partitions as you may desire and we can furnish the hangers to operate them.

Our Accordian type is applied where a half door is used at the jamb—the doors are centrally hung.

Our No. 402 and 405 folding types are applied where all doors are the same width—hangers are applied at the edge of the doors.

WRITE FOR OUR SET OF DETAILS NO. 4C

The McCabe Hanger Mfg. Company

W. H. Steel, Agent
Los Angeles, Calif.

425 W. 25th St.
New York City

General Machinery & Supply Co.
OFFICES and STORE: 39-51 STEVENSON STREET

TELEPHONE—Private Exchange—SUTTER 6750

—AGENTS FOR—

EVERLASTING BLOW-OFF VALVES

WM. Powell Co'S

White Star Valves—Model Star Valves
Union Composite Disc Valves
and Pilot Gate Valves

Yale & Towne:—Chain Hoists
Fisher and Swartwout Steam Specialties

ENGINEERS', MACHINISTS' and STEAM FITTERS' SUPPLIES
Pipe, Pipe-Fittings, Valves, Belting, Packing and Hose

Transmission and Conveying Machinery

SEND US YOUR INQUIRIES

When writing to Advertisers please mention this magazine.
Stone-Tile is Economical

Stone-Tile hollow concrete brick meets the prevailing demand for economy in building. Masonry construction at practically the same cost as frame construction and one-third less than ordinary brick is now made possible with this new building unit.

Stone-Tile combines fire and weather-proof qualities with attractive appearance and is especially suitable for homes, schools, churches, garages, warehouses and factories. It is adaptable to the structural characteristics of the average building, to arches, jambs, lintels, etc., without special fitting, and can be used without the necessity of special plans.

Of uniform high quality Stone-Tile has met the exacting requirements of the engineering division of one of America's largest trans-continental railroads and has been adopted by them for the construction of depots, warehouses, etc.

Write for special folder, "Stone-Tile Is Adaptable," showing the application of Stone-Tile to various building requirements.

National Stone-Tile Corporation
625 Market Street, San Francisco, California
Marble Fronts

give new value to the old building and make the new what it should be. They speak of stability and prosperity. They attract the kind of business that is worth having. They do away with repairs and the worry of rebuilding. Best of all they are proof against fire.

Vermont Marble Company
Proctor, Vermont
San Francisco
Tacoma

PROMETHEUS

The Electric Food and Plate Warmer
Wherever meals are cooked and served, in apartments, residences and institutions, Prometheus is a highly valued asset. The wireless heating units placed independently of the shelves keep food hot and tasty until ready to serve and cannot injure the finest china.

Write for information and list of installations
The Prometheus Electric Co.
Manufacurers
511 West 42d Street, New York
Showroom M. E. HAMMOND
Mezzanine Floor Pacific Bldg., San Francisco

DEPENDABILITY

“Since 1858”
LINOLELEUMS
WINDOW SHADIES

Carpets
Draperies
Rugs

Estimates furnished

D. N. & E.
Walter & Co.
562-572 Mission Street
SAN FRANCISCO
Los Angeles Portland Seattle

“Standard”

THIRTY-SIX years’ experience manufacturing and installing Electric Time Keeping Systems. Helpful engineering data cheerfully furnished architects, engineers and school boards insuring satisfactory results, and a direct factory branch office completely equipped to render immediate service.

The Standard
Electric Time Company
461 Market St., San Francisco, Cal.
Telephone Sutter 241
The fellow who rocks the boat may be lucky enough to avoid upsetting it.

And the man who saves a few dollars by eliminating the Von Duprin latches from the specifications may also be lucky; he may never have a fire or a panic in his building.

But the fact remains that the man who gambles with human lives is guilty of gross negligence, even though, through sheer luck, he escapes the consequences.

The adequate protection of those within a building includes not only fireproof construction, but also the installation of Von Duprin Self-Releasing Fire Exit latches. In case of fire or panic, the mere touch of hand or body on any of the Von Duprins immediately opens the way to safety.

We suggest the wisdom of insisting that your clients play safe in a matter so vitally important.

See complete specifications in "Sweet's," pages 1212-1216, or ask us for Catalog 12-L.
E. B. Noble, President
A. E. Wilkins, Vice-Pres.

Beam, Angle, Channels, and Universal Mill Plates for immediate shipment from stock

Pacific Rolling Mill Co.
SUPPLIERS OF
FABRICATED STRUCTURAL STEEL, Forgings
Bolts, Rivets, Frogs, Switches, Cast Iron Castings

General Office and Works
17th and MISSISSIPPI STS., SAN FRANCISCO
Telephone Market 215


Western Iron Works
STRUCTURAL IRON AND STEEL CONTRACTORS

Steel Wheel-barrows in Stock
141-147 Beale St. and 132-148 Main St. SAN FRANCISCO
Phones: GARFIELD 2575—2576

Steel Frame, California State Building, Civic Center, San Francisco.
FABRICATED BY
THE PALM IRON AND BRIDGE WORKS (Incorporated)
15th and R Streets, Sacramento

Bliss & Faville, Architects

UNION CONSTRUCTION CO.
CONTRACTORS AND ENGINEERS
Steel for All Types of Building Construction and Bridges
All Classes of General Machinery Tank and Pipe Work
Gold Dredges and Their Equipment
BALFOUR BLDG.
San Francisco Sutter 2790
Key Route Basin Oakland Lakeside 6300

When writing to Advertisers please mention this magazine.
Architects’ Specification Index
(For Index to Advertisements, see next page)

ASBESTOS MATERIALS
Johns-Manville Inc., of California, 500 Post street, San Francisco.

ART METAL
Federal Ornamental Iron and Bronze Co., 16th St., and San Bruno Ave., San Francisco.
Michelle & Pfeffer Iron Works, 1415 Harrison St., San Francisco.
California Artistic Metal & Wire Co., 349 Seventh street, San Francisco.

ARCHITECTURAL TERRA COTTA
Gladding, McBean & Company, Crocker Bldg., San Francisco.
Tropico Pottery, Inc., Glendale, Cal.

AUTOMOBILES
W. L. Hughes Co., Geary St., at Van Ness Ave., San Francisco.

BANK FIXTURES AND INTERIORS
Fink & Schindler, 218 13th St., San Francisco.
Home Mfg. Co., 543 Brannan St., San Francisco.
Mullen Manufacturing Co., 64 Rausch St., San Francisco.
Rucker-Fuller Desk Co., 677 Mission St., San Francisco.
Pacific Manufacturing Company, San Francisco, Los Angeles, Oakland and Santa Clara.

BEDS—WALL
California Wall Bed Co., 714 Market St., San Francisco.
Leverett T. Spaulding, 1041 Mission St., San Francisco.

BELTING AND PACKING
New York Beltling and Packing Company, 519 Mission St., San Francisco.
H. N. Cook Beltling Co., 401 Howard St., San Francisco.
Smith-Booth-Usher Co., San Francisco and Los Angeles.

BLACKBOARDS
Beaver Blackboards and Greenboards—Coast Agents, Rucker-Fuller Desk Company, 677 Mission St., San Francisco; also Oakland and Los Angeles.
Stuart Sales Co., 247 Rialto Building, San Francisco.

BLINDS—VENETIAN AND DIFFUSELITE

BOILERS
Kewance Boiler Company, Factory Branch, Exhibition Building, San Francisco.
Kewance Water Supply System, Simonds Machinery Co., 117 New Montgomery St., San Francisco.

BONDS FOR CONTRACTORS
Bonding Company of America, Kohl Bldg., San Francisco.
Globe Indemnity Co., 444 California St., San Francisco.
Fidelity & Casualty Co. of New York, Balfour Bldg., San Francisco.
National Surety Co. of New York, 163 Montgomery St., San Francisco.
William Healey & Son, 268 Crocker Building, San Francisco.

BRASS GOODS, CASTINGS, ETC.
H. Mueller Manufacturing Co., 635 Mission St., San Francisco.

BRICK, PRESSED, COMMON, ETC.
Richmond Pressed Brick Co., Sharon Bldg., San Francisco. Plant at Richmond, Cal.
Cannon & Co., Sacramento; and 77 O'Farrell St., San Francisco.

BRICK & CEMENT COATING
Armorite and Concreta, manufactured by W. P. Fuller & Co., all principal Coast cities.
The Paraffine Companies, Inc., 34 First St., San Francisco.

BRICK STAINS
Armorite and Concreta, manufactured by W. P. Fuller & Co., all principal Coast cities.

BUILDERS’ HARDWARE
Jost Bros., agents for Russell & Erwin Hardware, 1035 Market St., San Francisco.
Palace Hardware Company, Agents Corbin goods, 581 Market St., San Francisco.

BUILDING MATERIALS, SUPPLIES, ETC.
Abel-Jensen Co., Call Bldg., San Francisco.
Waterhouse-Wilcox Co., 523 Market St., San Francisco.

RALSTON IRON WORKS, INC.
ESTABLISHED 1876
20th and Indiana Streets
SAN FRANCISCO
Phone Mission 5230

Representing
Pauly Jail Building Co.

When writing to Advertisers please mention this magazine.
NASON’S OPAQUE FLAT FINISH A VALUABLE OIL PAINT FOR WALLS, CEILINGS, ETC. Made in California to stand Pacific Coast climate condition

R. N. Nason & Co., Paint Makers
PORTLAND 151 Potrero Ave.—SAN FRANCISCO—436 Market St. SEATTLE

ARCHITECTS’ SPECIFICATION INDEX—Continued

BUILDING PAPER
The Paraflame Companies, Inc., San Francisco, Los Angeles, Portland and Seattle.

CABINET MAKERS
Home Manufacturing Company, 543 Brannan St., San Francisco.
Fink & Schindler Co., 218-12th St., San Francisco.
Mullen Manufacturing Company, 61 Rausch St., San Francisco.

CARPETs
John Breuner Co., 281 Geary St., San Francisco.
D. N. & E. Walter, Mission near Second St., San Francisco.
W. & J. Shoane, 216-228 Sutter St., San Francisco.
Edward J. Margrett, 81 Ellis St., San Francisco.

CASEMENT WINDOW HARDWARE

CASTINGS

CEMENT
Atlas Portland Cement Co., agencies in all principal Coast cities.
Mt. Diablo, sold by Henry Cowell Lime & Cement Co., 2 Market St., San Francisco.

CEMENT EXTERIOR WATERPROOF PAINT
Armorite, sold by W. P. Fuller & Co., all principal Coastal cities.

CEMENT TESTS—CHEMICAL ENGINEERS
Robert W. Hunt & Co., 251 Kearny St., San Francisco.

CLAY PRODUCTS
Cannon & Co., Sacramento, Cal.
Gladding, McBean & Co., Crocker Bldg., San Francisco.
Los Angeles Pressed Brick Co., Frost Bldg., Los Angeles.
Tropic Potteries, Inc., Glendale, Cal.
S. & S. Tile Company, San Jose, Calif.

CLOCKS—ELECTRIC TIME
Pacific Electric Clock Co., 711 Wells-Fargo Bldg., San Francisco.

Standard Electric Time Co., 161 Market St., San Francisco.

COLD STORAGE PLANTS
T. E. Jarvis Crude Oil Burning Co., 275 Congress St., San Francisco.
Cyclops Iron Works, 837 Folsom St., San Francisco.

COMPOSITION FLOORS
“Linotol” plastic flooring, Hill, Hubbell & Co., 115 Davis St., San Francisco; 110 San Fernando Bldg., Los Angeles.

CONCRETE BUILDING ACCESSORIES

CONCRETE OR CEMENT HARDENER
Gunn, Carle & Co., Inc., 441 Market St., San Francisco.

CONCRETE MIXERS
Foote and Jaeger mixers sold by Edward R. Bacon Co., 51 Minna St., San Francisco, also Los Angeles.
Ransome mixers sold by the Garfield Co., Hearst Bldg., San Francisco.

CONCRETE REINFORCEMENT
United States Steel Products Co., San Francisco, Los Angeles, Portland and Seattle.
Clinton Welded Wire Fabric, Wickwire Spencer Steel Corporation, 111 Townsend St., San Francisco.
Pacific Coast Steel Company, Rialto Bldg., San Francisco.
Truscon Steel Co., 327 Tenth St., San Francisco.
Badi-Falk Co., Cal-Post Bldg., San Francisco.

CONDUTS
Garnett, Young & Co., 612 Howard St., San Francisco.

CONTRACTORS, GENERAL
Barrett & Hilp, 918 Harrison St., San Francisco.
Larsen-Siegert Co., Inc., 897 Claus Spreckels Bldg., San Francisco.
R. W. Littlefield, 357-12th St., Oakland.
K. E. Parker Co., Inc., Clunie Bldg., San Francisco.
Dinwiddie Construction Co., Crocker Bldg., San Francisco.
Roege Bros., California Commercial Union Bldg., San Francisco.

Satinette White Enamel
Flatline Cabinet Finish
Elastica Interior and Elastica Exterior

Standard Varnish Works
55 Stevenson Street
San Francisco

When writing to Advertisers please mention this magazine.
The Pneumatic Painting Machine Co.
G. H. GRENVILLE, Manager
1046 Monadnock Building, San Francisco
Phone Sutter 471

ARCHITECTS' SPECIFICATION INDEX—Continued

John M. Bartlett, 517 Twelfth St., Oakland.
Chas. Stockholm & Son, Monadnock Bldg., San Francisco.
Herbert Beckwith, Everson Bldg., Oakland.
Collman & Spieidel, 546 Monadnock Bldg., San Francisco.
Clinton Construction Company, 140 Townsend St., San Francisco.
McLeran & Co., 251 Kearny St., San Francisco.
Fontanella & Teza, 1682 Eddy St., San Francisco.
G. Wagner, 251 Kearny St., San Francisco.
T. B. Goodwin, 180 Jessie St., San Francisco.
Robert Trost, 26th and Howard Sts., San Francisco.
J. M. Sommer, 401 Balboa Bldg., San Francisco.
Jas. L. McLoughlin, 251 Kearny St., San Francisco.
Alfred H. Vogt, 185 Stevenson St., San Francisco.
CONTRACTORS' EQUIPMENT
Edward R. Bacon Co., 51 Minna St., San Francisco, and Los Angeles.
Garfield & Co., Hearst Bldg., San Francisco.
Smith, Folsom-Usher Co., 60 Fremont St., San Francisco; 228 Central Ave., Los Angeles.
CONVEYING MACHINERY
Messe & Gottfried, San Francisco, Los Angeles, Portland and Seattle.
CONVENIENCE OUTLETS
Harvey Hubbell, Inc., Bridgeport, Conn., represented in San Francisco by Garnett Young & Co., 612 Howard St.
CORK TILE
David E. Kennedy, Inc., 305 Crocker Bldg., San Francisco.
Van Fleet-Freear Co., Sharon Bldg., San Francisco.
CRUSHED ROCK
Coast Rock & Gravel Co., Call-Post Bldg., San Francisco.
CURTAIN—STEEL, ROLLING, FIREPROOF
DAMP-PROOFING AND WATERPROOFING
"Papco" Damp-Prooﬁng Compound, sold by the Parafﬁne Companies, Inc., San Francisco, Los Angeles, Portland and Seattle.
DOOR HANGERS
McCabe Door Hanger Company, leading hardware stores.
Stanley Works, New Britain, Conn., Monadnock Bldg., San Francisco.
DRAIN PIPE AND FITTINGS
Pacific Foundry Co., Harrison and 18th Sts., San Francisco.
DRINKING FOUNTAINS
Crane Company, San Francisco, Oakland, and Los Angeles.
Pacific Porcelain Ware Co., 67 New Montgomery St., San Francisco.
Haines, Jones & Cadbury Co., 857 Folsom St., San Francisco.
DUMB WAITERS
Spencer Elevator Company, 166-7th St., San Francisco.
San Francisco Elevator Company, Inc., 869 Folsom St., San Francisco.
ELECTRICAL CONTRACTORS
Butte Electrical Equipment Company, 530 Folsom St., San Francisco.
Butte Electric & Manufacturing Co., 534 Folsom St., San Francisco.
Brown-Langlais Electrical Construction Co., 313 5th St., San Francisco.
Central Electric Company, 185 Stevenson St., San Francisco.
Neff & Co., 589 Howard St., San Francisco.
Newbery Electrical Co., 359 Sutter St., San Francisco.
Pacific Fire Extinguisher Co., 424 Howard St., San Francisco.
Globe Electric Works, 1559 Mission St., San Francisco.
M. E. Ryan, Redwood City, and 520 Clunie Bldg., San Francisco.
H. S. Tittle, 764 Folsom St., San Francisco.
ELECTRIC PLATE WARMER
The Prometheus Electric Plate Warmer for residences, clubs, hotels, etc. Sold by M. E. Hammond, Pacific Bldg., San Francisco.
ELECTRIC TOWEL
The AIRDY Electric Towel for clubs, office buildings, hotels, schools, etc., represented on Pacific Coast by Airdry Co., of California, 155 Montgomery St., San Francisco.
ARCHITECTS’ SPECIFICATION INDEX—Continued

FLOORS—Mastic—Floor Covering
Ruhl-Hebbell & Company, 112 Davis St., San Francisco.
The Paraffine Companies, Inc., San Francisco, Los Angeles, Portland and Seattle.

FUEL OIL SYSTEMS
S. T. Johnson Co., 1337 Mission St., San Francisco.
S. E. Bowser & Co., Inc. 612 Howard St., San Francisco.
Wayne Tank and Oil Co., 631 Howard St., San Francisco.

FURNACES—Warm Air
Mangrum & Otter, 827 Mission St., San Francisco.
Montague Range and Furnace Co., 826 Mission St., San Francisco.
Pacific Heating Company, Second and Grove Sts., Oakland.

FURNITURE—Built-in
Hoosier Kitchen Cabinet Store, Pacific Bldg., San Francisco.

FURNITURE—School, Church, Etc.
Home Manufacturing Company, 543 Brannan St., San Francisco.
Rucker-Fuller Desk Co., 677 Mission St., San Francisco.
F. W. Wentworth & Co., 539 Market St., San Francisco.
W. & J. Sloane, 216 Sutter St., San Francisco.

GARAGE HARDWARE
The Stanley Works, New Britain, Conn., Coast sales office, San Francisco, Los Angeles and Seattle, Wash.

GLASS
American Window Glass Co., represented by L. H. Butcher Co., 562 Mission St., San Francisco.
Cobbledick-Kibbe Glass Co., 175 Jessie St., San Francisco.
Fuller & Goep, 32 Page St., San Francisco, and Syndicate Bldg., Oakland.
W. P. Fuller & Company, principal Coast cities.

GRADING, WRECKING, ETC.
Dolan Wrecking & Construction Co., 1607 Market St., San Francisco.

GRANITE
California Granite Co., Builders’ Exchange, San Francisco.
Raymond Granite Co., Potrero Ave., and Division St., San Francisco.

GRAVEL AND SAND
Coast Rock & Gravel Co., Call-Post Bldg., San Francisco.

Del Monte White Sand, sold by Del Monte Properties Co., Crocker Bldg., San Francisco.

GYMNASIUM EQUIPMENT
Ellery Arms Co., 583 Market St., San Francisco.

HARDWARE
Joost Bros., agents for Russell & Erwin Hardware, 1053 Market St., San Francisco.
The Stanley Works, New Britain, Conn.; Coast sales offices, San Francisco, Los Angeles, and Seattle, Wash.
Corbin hardware, sold by Palace Hardware Co., 581 Market St., San Francisco.
Vonnegut hardware, sold by Abeel-Jensen Co., Call Bldg., San Francisco.

HARDWOOD LUMBER—FINISH, ETC.
Parrott & Co., 320 California St., San Francisco.
Stable Hardwood Company, First St., near Broadway, Oakland.
E. L. Bruce Company, American oak flooring, Memphis, Tenn.

HEATERS—Automatic, Gas, Electric
Pittsburgh Water Heater Co., 475 Sutter St., San Francisco.
Pure Air Gas Heating Co., 401 Battery St., San Francisco.
Ra-Do Fumeless Gas Heater, sold by Baird-Bailhache Company, 478 Sutter St., San Francisco.

HEATING AND VENTILATING CONTRACTORS’ EQUIPMENT, ETC.
Alexander Coleman, 706 Ellis St., San Francisco.
Gilley-Schmid Company, 198 Otis St., San Francisco.
Hateley & Hateley, Mitau Bldg., Sacramento.
Mangrum & Otter, 827-831 Mission St., San Francisco.
Lawson & Drucker, 430 Hayes St., San Francisco.
Carl T. Doell, 467 21st St., Oakland.
F. L. Warner, 2206 San Pablo Ave., Oakland.
Luppen, Hawley & Thing, 986 7th St., Sacramento.
James A. Nelson, 317 Sixth St., San Francisco.
William F. Wilson Co., 325 Mason St., San Francisco.
Pacific Fire Extinguisher Co., 424 Howard St., San Francisco.
Scott Company, 243 Minna St., San Francisco.
ARCHITECTS' SPECIFICATION INDEX—Continued

Tiltz Engineering & Equipment Co., 479 Moadnock Bldg., San Francisco.
HOLLOW TILE BLOCKS
Cannon & Co., plant at Sacramento; 770 O'Farrell St., San Francisco.
Cneider, McBean & Co., San Francisco, Los Angeles, Oakland and Sacramento.
Los Angeles Pressed Brick Co., Frost Bldg., Los Angeles.
HOSPITAL FIXTURES
Mott Company of California, 553 Mission St., San Francisco.
HOSPITAL SIGNAL SYSTEM
Chicago Signal Co., represented by Garnett Young & Co., 612 Howard St., San Francisco.
HOTELS
St. Francis Hotel, Powell, Geary and Post Sts., San Francisco.
ICE MAKING MACHINERY
Cyclops Iron Works, 537 Folsom St., San Francisco.
INGOT IRON
"Armco" brand, manufactured by American Rolling Mill Company, Middletown, Ohio, and 10th and Bryant Sts., San Francisco.
INSPECTIONS AND TESTS
Robert W. Hunt & Co., 251 Kearny St., San Francisco.
INSULATION—CORK
Van Fleet-Freear Co., Sharon Bldg., San Francisco.
INSURANCE BROKERS
William Healey & Son, Crocker Bldg., San Francisco.
INTERIOR DECORATORS
Martin & Frederick, 1374 Sutter St., San Francisco.
The Tormey Co., 1042 Larkin St., San Francisco.
A. Quandt & Son, 374 Guerrero St., San Francisco.
JAIL EQUIPMENT
Rolston Iron Works, 26th and Indiana Sts., San Francisco.
KITCHEN CABINETS
Hoosier Kitchen Cabinet Store (O. K. Brown, Mgr.), Pacific Bldg., San Francisco.
KITCHEN EQUIPMENT
Griffin Sheet Metal Works, Fresno.
LAMP POSTS, ELECTROLIERS, ETC.
J. L. Mott Iron Works, 553 Mission St., San Francisco.
LANDSCAPE ARCHITECT
Emerson Knight, 704 Market St., San Francisco.
LANDSCAPE GARDENERS
MacRorie-McLaren Co., 514-516 Phelan Bldg., San Francisco.
LATHING AND PLASTERING
McGuer & Simpson, 228 Tehama St., San Francisco.
A. Knowles, Call-Post Bldg., San Francisco.
LATHING MATERIAL—WIRE, ETC.
Pacific Materials Co., 525 Market St., San Francisco.
Truscon Steel Co., Tenth St., near Bryant, San Francisco.
Wiekwire Spencer Steel Corporation, 111 Townsend St., San Francisco.
LIGHT, HEAT AND POWER
Great Western Power Company, Stockton St., near Sutter, San Francisco.
Pacific Gas & Electric Co., Sutter St., San Francisco.
LIGHTING FIXTURES
Thomas Day Company, Mission, near Third St., San Francisco, and Oakland.
Roberts Mfg. Co., 663 Mission St., San Francisco.
Electric Appliance Co., 807 Mission St., San Francisco.
LIME
Henry Cowell Lime & Cement Co., 2 Market St., San Francisco.
LINOLEUM
D. N. & E. Walter & Co., 562 Mission St., San Francisco.
The Paraflne Companies, factory in Oakland; office, 34 First St., near Market, San Francisco.
W. & J. Sloan, 216 Sutter St., San Francisco.
David E. Kennedy, Inc., Crocker Bldg., San Francisco.
LUMBER
Dudfield Lumber Co., Palo Alto, Cal.
Hart-Wood Lumber Co., Fifth and Berry Sts., San Francisco.
Pope & Talbot, foot of Third St., San Francisco.
Santa Fe Lumber Co., 16 California St., San Francisco.
Sunset Lumber Company, First and Oak Sts., Oakland.
MAGNESITE FLOORING, STUCCO, ETC.
Dorite Mfg. Co., 116 Utah St., San Francisco; Metropolitan Bldg., Los Angeles.
MAIL CHUTES
American Mailing Device Corp., represented on Pacific Coast by Waterhouse-Wilcox Co., 523 Market St., San Francisco.

RAY COOK MARBLE CO.
IMPORTED AND DOMESTIC MARBLES
For Building Construction
Factory and Office, foot of Powell St., Oakland
Phone Piedmont 1009

When writing to Advertisers please mention this magazine.
MANTELS—WOOD, TILE, ETC.
Mangrum & Otter, 827-831 Mission St., San Francisco.
Pink & Schindler, 218-12th St., San Francisco.

MACHINERY AND TRAINEE EQUIPMENT
Smith-Booth-Usher Co., San Francisco and Los Angeles.

MARBLE
American Marble and Mosaic Co., 25 Columbus Square, San Francisco.
Bay Cook Marble Company, foot of Powell St., Oakland.
Joseph Musto Sons, Keenan Co., 355 N. Point St., San Francisco.
Vermer Marble Co., Coast branches, San Francisco, Portland and Tacoma.
Tompkins-Kiel Marble Company, 565 Fifth Ave., New York; also Chicago, Philadelphia and San Francisco.

METAL DOORS AND WINDOWS
Fire Protection Products Co., 3117-20th St., San Francisco.
Waterhouse-Wilcox Co., Inc., 523 Market St., San Francisco.
U. S. Metal Products Co., 330 Tenth St., San Francisco.

METAL FURNITURE
Forderer Cornice Works, 289 Potrero Ave., San Francisco.

METAL TOILET—PARTITIONS

MILL WORK
Dudfield Lumber Co., Palo Alto, Calif.
Pacific Manufacturing Company, San Francisco, Los Angeles, Oakland and Santa Clara.
National Mill and Lumber Co., San Francisco and Oakland.
The Fink & Schindler Co., 218-13th St., San Francisco.

NOTARY PUBLIC
William Healey & Son, 298 Crocker Bldg., San Francisco.

OIL BURNERS
Coco, Inc., 112 Market St., San Francisco.
Fess System Co., 220 Natoma St., San Francisco.
S. T. Johnson Co., 1337 Mission St., San Francisco.
G. E. Witt Co., 862 Howard St., San Francisco.
W. S. Ray Manufacturing Co., 29 Spear St., San Francisco.
F. H. Ward, 456-20th St., Oakland.

OIL STORAGE AND DISTRIBUTING STATIONS
S. F. Bowser & Co., Inc., 612 Howard St., San Francisco.
S. T. Johnson Co., 1337 Mission St., San Francisco.
Wayne Oil Tank & Pump Co., 631 Howard St., San Francisco; 330 S. Los Angeles St., Los Angeles.

ORNAMENTAL IRON AND BRONZE
California Artistic Metal and Wire Co., 349 Seventh St., San Francisco.
Federal Ornamental Iron and Bronze Co., 16th St., and San Bruno Ave., San Francisco.
Michel & Pfeffer Iron Works, 1415 Harrison St., San Francisco.
Palm Iron & Bridge Works, Sacramento.

Schrader Iron Works, Inc., 1247 Harrison St., San Francisco.

OVERHEAD CARRYING SYSTEMS
California Hydraulic Engineering & Supply Co., 79-72 Fremont St., San Francisco.

PANIC DOORS
Vonneget hardware, sold by Abel-Jensen Co., Call Bldg., San Francisco.

PAINT FOR STEEL STRUCTURES, BRIDGES, ETC.
The Paraffine Companies, Inc., 34 First St., San Francisco.
Hill, Hubbell & Company, 115 Davis St., San Francisco.

PAINTING—SPRAY EQUIPMENT
Pneumatic Painting Machinery Co., 1046 Madrono Bldg., San Francisco.

PAINTING, TINTING, ETC.
I. R. Kissel, 1747 Sacramento St., San Francisco.
D. Zelinsky & Sons, San Francisco and Los Angeles.
The Torrey Co., 681 Geary St., San Francisco.
A. Quaundt & Son, 374 Guerrero St., San Francisco.

PAINTS, OILS, ETC.
Magurn Bros., 414-424 Ninth St., San Francisco.
Bass-Hueber Paint Co., Mission, near Fourth St., San Francisco and all principal Coast cities.
W. P. Fuller & Co., all principal Coast cities.
Satinette,” Standard Varnish Works, 53 Stevenson St., San Francisco.
The Paraffine Companies, Inc., San Francisco, Los Angeles, Portland and Seattle.

PARTITIONS—FOLDING AND ROLLING

PIPE—STEEL AND WROUGHT IRON
Western Pipe & Steel Co., 444 Market St., San Francisco; 1558 N. Broadway, Los Angeles.

PIPE FITTINGS

PLASTERING CONTRACTORS
A. Knowles, Call Bldg., San Francisco.
MacGruer & Simpson, 266 Tehama St., San Francisco.

PLUMBING CONTRACTORS
Aless Coleman, 786 Ellis St., San Francisco.
Gilley-Schmid Company, 198 Otis St., San Francisco.
Dowell, Carl T., 467 21st St., Oakland.
Hately & Hately, Mitau Bldg., Sacramento.
Scott Co., Inc., 243 Minna St., San Francisco.
Wm. F. Wilson Co., 328 Mason St., San Francisco.
W. H. Picard, 5656 College Ave., Oakland.
Luppen, Hawley & Thing, 906 7th St., Sacramento.

PLUMBING FIXTURES, MATERIALS, ETC.
California Steam & Plumbing Supply Co., 671 Fifth St., San Francisco.
Crane Co., San Francisco, Oakland, Los Angeles.
Gilley-Schmid Company, 198 Otis St., San Francisco.
Cook Metal Works, Haines, Jones & Cadbury Co., 837 Folsom St., San Francisco.

When writing to Advertisers please mention this magazine.
POLES AND PILING
OIL RIG AND SHIP TIMBERS
SAGINAW SPECIAL SHINGLES
16 California Street

SAN FRANCISCO, CALIF.

Pine and Redwood Lumber
SASH DOORS AND MILL WORK

SUNSET LUMBER COMPANY
MANUFACTURERS — WHOLESALE AND RETAIL
Main Office and Yards:
FIRST AND OAK STREETS, OAKLAND

Phone Oakland 1820

POPE & TALBOT
Manufacturers, Exporters and Dealers in
Lumber, Timber, Piles, Spars, Etc.
Office, Yards and Planing Mills
859-869 THIRD STREET, SAN FRANCISCO, CAL.
Mills: Port Gamble, Port Ludlow and Utsalady, Washington

PACIFIC MANUFACTURING COMPANY
MILLWORK, SASH AND DOORS
Hardwood Interior Trim a Specialty
Main Office:
SANTA CLARA, CALIFORNIA
SAN FRANCISCO, 177 Stevenson Street
OAKLAND, 1001 Franklin Street

LOS ANGELES, 998 Washington Building
SAN JOSE, 16 North First Street

When writing to Advertisers please mention this magazine.
ARCHITECTS' SPECIFICATION INDEX—Continued

BLACKBOARDS
First Grade Natural Slate Green or Black Composition Board
Estimates Given for Complete Installations School Furniture and Supplies
STEWART SALES CO.
247 Rialto Building San Francisco, Cal.

ARCHITECTS' SPECIFICATION INDEX—Continued

H. Mueller Manufacturing Company, 635 Mission St., San Francisco.
Holbrook, Merrill & Stetson, 64 Sutter St., San Francisco.
J. L. Mott Iron Works, D. H. Gulick, selling agent, 553 Mission St., San Francisco.
Pacific Sanitary Manufacturing Co., 67 New Montgomery St., San Francisco.
West Coast Porcelain Manufacturers, Oceanic Bldg., San Francisco.
POLES AND PLUNGING
Santa Fe Lumber Co., 16 California St., San Francisco.

POWER TRANSMITTING MACHINERY
Meese & Gottfried, San Francisco, Los Angeles, Portland, Ore., and Seattle, Wash.
PRELIMINARY ESTIMATES, VALUATIONS

PUMPS
Chicago Pump Co., represented by Garnett, Young & Co., 612 Howard St., San Francisco.
California Hydraulic Engineering & Supply Co., 70 Fremont St., San Francisco.
Simonds Machinery Co., 117 New Montgomery St., San Francisco.
Ocean Shore Iron Works, 558 Eighth St., San Francisco.

PUMPS—HAND OR POWER
Pelton Waterwheel Co., 2022 Harrison St., San Francisco.
S. F. Bowser & Co., Inc., 612 Howard St., San Francisco.
S. T. Johnson Co., 1337 Mission St., San Francisco.
Wayne Tank & Pump Co., 631 Howard St., San Francisco; 530 S. Los Angeles St., Los Angeles.

QUANTITY SURVEYOR FOR CONTRACTORS

RADIATORS—ELECTRIC STEAM
William J. Schwerin, 217 Rialto Bldg., San Francisco.

REINFORCING STEEL
Edward L. Soule, Rialto Bldg., San Francisco.
Badi-Falk & Co., Call Bldg., San Francisco.
Judson Iron Works, San Francisco and Oakland.
Gunn, Carle & Co., Inc., 444 Market St., San Francisco.
Pacific Coast Steel Co., Rialto Bldg., San Francisco.
Truscon Steel Co., 527-10th St., San Francisco.

REFRIGERATORS
McCray Refrigerator Company San Francisco office, 765 Mission St.

ROCK AND GRAVEL
Coast Rock & Gravel Co., Call Bldg., San Francisco.

ROOFING AND ROOFING MATERIALS
"Malthead" and "Ruberoid," also "Pabco" ten and twenty year roofs, manufactured by the Paraffine Companies, Inc., San Francisco.
H. H. Robertson Co., Hobart Bldg., San Francisco.
Jones Brothers Asbestos Supply Co., 512 Second St., San Francisco.
Johns-Manville Inc., of California, 500 Post St., San Francisco.

RUBBER TILING
New York Belting and Packing Company, 518 Mission St., San Francisco.

RUGS & CARPETS
Edw. J. Margrett, 61 Ellis St., San Francisco.
W. & J. Sloane, 216 Sutter St., San Francisco.

SAFETY TREADS
Pacific Materials Co., 525 Market St., San Francisco.

SAND
Coast Rock & Gravel Co., Call Bldg., San Francisco.
Dele Monte White Sand, Del Monte Properties Co., 401 Crocker Bldg., San Francisco.

SASH AND CABLE CHAINS
Smith & Egge Mfg. Co., Bridgeport, Conn.
Coast agents, Rawlins & Smith, San Francisco and Los Angeles.

SAFES AND VAULTS
Hermann Safe Company, 216 Fremont St., San Francisco.

SCREWFASTENING—DROP CURTAINS, ETC.
The Edw. H. Flagg Scene Co., 1638 Long Beach Ave., Los Angeles, and 17th and Mission Sts., San Francisco.

SHEATHING AND SOUND DEADENING
The Paraffine Companies, Inc., 31 First St., San Francisco.

SHEET METAL WORK
Forderer Cornice Works, 269 Potrore Ave, San Francisco.
Griffin Sheet Metal Works, Fresno, Cal.
Pacific Heating Company, Second and Grove Sts., Oakland.
U. S. Metal Products Co., 330-10th St., San Francisco.
Fire Protection Products Co., 3117-29th St., San Francisco.

ARE YOU INTERESTED IN INSURANCE?

PHONE K.E.A.R.N.

WM. HEALEY & SON
INSURANCE BROKERS
208 CROCKER BLDG., SAN FRANCISCO

W. W. Healey, Notary Public

When writing to Advertisers please mention this magazine.
ARCHITECTS’ SPECIFICATION INDEX—Continued

SHINGLE STAINS
Bass-Hueber Paint Company, all principal Coast cities.
Cahot’s Creosote Stains, sold by Pacific Bldg., Materials Co., 325 Market St., San Francisco.
Fuller’s Pioneer Shingle Stains, made by W. P. Fuller & Co., San Francisco.
SHINGLES—COMPOSITION, UNIT AND STRIP
The Paraffine Companies, Inc., San Francisco, Los Angeles, Portland and Seattle.
SHUTTERS—ROLLING, FIRE, STEEL, WOOD
J. G. Wilson Corp., 621 North Broadway, Los Angeles.
SINKS—COMPOSITION
SKYLIGHTS
H. H. Robertson Co., 1067 Hobart Bldg., San Francisco.
STEEL HEATING BOILERS
Kewanee Boiler, factory branch, Exposition Building, San Francisco.
STEEL TANKS, PIPE, ETC.
Ocean Shore Iron Works, 55 Eighth St., San Francisco.
S. T. Johnson Co., 1337 Mission St., San Francisco.
Western Pipe and Steel Co., 444 Market street, San Francisco.
STEEL AND IRON—STRUCTURAL
Central Iron Works, 621 Florida St., San Francisco.
Michel & Pfeffer Iron Works, 1415 Harrison street, San Francisco.
Mortenson Construction Co., 19th and Indiana Sts., San Francisco.
Pacific Rolling Mills, 17th and Mississippi Sts., San Francisco.
Pfifer Iron & Bridge Works, Sacramento.
U. S. Steel Products Co., Kialto Bldg., San Francisco.
Ralston Iron Works, 20th and Indiana streets, San Francisco.
Schrader Iron Works, Inc., 1247 Harrison St., San Francisco.
Union Construction Co., 604 Mission street, San Francisco and Key Route Feli, Oakland.
Western Iron Works, 141 Beale St., San Francisco.
STEEL ROLLING DOORS
Kinneary Rolling Steel Doors, sold by Pacific Building Materials Co., Underwood Bldg., San Francisco.

Wilson Rolling Steel Doors, the J. G. Wilson Corporation, 621 North Broadway, Los Angeles and Waterhouse-Wilcox Co., 523 Market St., San Francisco.

STEEL SASH
Bayley-Springfield solid steel sash, sold by Pacific Materials Co., 525 Market St., San Francisco.
Michel & Pfeffer Iron Works, 1415 Harrison street, San Francisco.
U. S. Metal Products Company, 330 Tenth St., San Francisco.
Truscon Steel Company, 527 Tenth street, San Francisco.

STORE FRONTS

STUCCO AND STUCCO BASE

STUDDING—FIREPROOF STEEL
Steel Studding Company, 1216 Folsom St., San Francisco.

SWITCHES AND SWITCHBOARDS
Safety Electric Co., 59 Columbia Square, San Francisco.
Western Electric Safety Switch Co., Inc., 247 Minna street, San Francisco.
Meyer’s Safety Switch Co., 575 Howard Street, San Francisco.

TELEPHONE SYSTEMS
“Connecticut” Intercommunicating Telephones, Myers & Schwartz, 71 New Montgomery St., San Francisco.

THEATER AND OPERA CHAIRS
Bucker-Fuller Desk Co., 677 Mission street, San Francisco.

THERMOSTATS FOR HEAT REGULATION
Johnson Service, Kialto Bldg., San Francisco.

TILE FOR ROOFS, MANTELS, ETC.
Cannon & Co., Sacramento; and 77 O’Farrell St. San Francisco.
Gladding, McBean & Co., Crocker Bldg., San Francisco.
S. & S. Tile Co., 4th and Carrie streets, San Jose.

LINOLEUMS
WINDOW SHADERS
CARPETs
FURNITURE

W. & J. SLOANE
216-228 SUTTER STREET
SAN FRANCISCO
Phone: GARFIELD 2838

When writing to Advertisers please mention this magazine.
ARCHITECTS' SPECIFICATION INDEX—Continued

TILE—STONE—CEMENT

TRANSMISSION MACHINERY
Meese & Gottfried Co., San Francisco, Los Angeles, Portland and Seattle.

TRAVELING CRANES
Cycolops Iron Works, 537 Folsom St., San Francisco.

VALVES—PIPES AND FITTINGS
Crane Radiator Valves, manufactured by Crane Co., Second and Brannan Sts., San Francisco.
Grinnell Co., 453 Mission St., San Francisco.
O. M. Simmons Co., 115 Mission St., San Francisco.

VALVE PACKING
N. H. Cook Belting Co., 317 Howard St., San Francisco.

VARNISHES
W. P. Fuller Co., all principal Coast cities.
Standard Varnish Works, 55 Stevenson St., San Francisco.
Supreme Varnish and Enamel Co., Sharon Bldg., San Francisco.

VENTILATORS
H. H. Robertson Co., 1907 Hobart Bldg., San Francisco.

VITREOUS CHINAWARE
Pacific Porcelain Ware Company, 67 New Montgomery St., San Francisco.
West Coast Porcelain Manufacturers, 424 Oceanic Bldg., San Francisco.

WALL BEDS—SEATS, ETC. (See Beds)

WALL BOARD

WALL PAINT

WALL PAPER AND DRAPERIES
The Tormey Co., 681 Geary St., San Francisco.
W. & J. Sloane, 216-228 Sutter St., San Francisco.
Uhl Bros., San Francisco.

WATERPROOFING (see Damp-proofing)
WATER SUPPLY SYSTEMS
Kewanee Water Supply System—Simonds Machinery Co., agents, 117 New Montgomery St., San Francisco.
Smith-Booth-Usher Co., San Francisco and Los Angeles.

WHEELBARROWS—STEEL
Western Iron Works, Beale and Main Sts., San Francisco.

WHITE ENAMEL
"Gold Seal," manufactured and sold by Bass-Hueter Paint Co. All principal Coast cities.
The Paraffine Companies, Inc., 34 First St., San Francisco, Los Angeles, Portland and Seattle.

WINDOw SASH CHAIN

WINDOW SHADES
W. & J. Sloane, 216 Sutter street, San Francisco.
D. N. & E. Walfer, 562 Mission street, San Francisco.

WINDOWS, REVERSIBLE, CASEMENT, ETC.
Crittall Casement Window Co., Detroit; Waterhouse & Wilcox, San Francisco, representatives.
Hauser Window Co., 157 Minna St., San Francisco.

WIRE FENCE
Standard Fence Co., 215 Market street, San Francisco; and 310 12th street, Oakland.

---

GLOBE AUTOMATIC SPRINKLERS
Will protect your building and business from destruction by fire and reduce your Insurance Rate. Write for estimates.

Pacific Fire Extinguisher Company
FIRE PROTECTION ENGINEERS
424-440 Howard Street, San Francisco
Manufacturing Plant, 298 Fremont St.

When writing to Advertisers please mention this magazine.
Help Protect American Homes

Japanese Oak Flooring, of very poor quality, is occasionally substituted for the American, either as being "just as good" or because of lower price. Sometimes it is sold as American-grown.

The foreign product betrays its inferiority to the expert by its porous, brashy nature, its dull, dead appearance, its tendency to "spot" and its total lack of the beautiful grain which marks the American. Many cases are reported where Japanese Oak Flooring has had to be ripped up and replaced by the American, at great expense.

We know that you will co-operate with us to protect the public against this costly experiment.

Our free booklets, in colors, containing accurate and authoritative information on genuine American Oak Flooring, should be in your files. Mailed on request.

OAK FLOOR ADVERTISING BUREAU
1036 Ashland Block Chicago, Ill.

"Simple--Strong--Efficient"

Stewart Mixer with Loader and Tank Sizes
4 cu. ft. and 7 cu. ft. of mixed concrete

That's what users say of the STEWART Tilting Drum CONCRETE MIXERS with Hercules Engine drive.

And there's one thing more to add—they're Reasonably Priced

For sale by

Smith-Booth-Usher Co.
CONTRACTORS AND INDUSTRIAL EQUIPMENT
SAN FRANCISCO
50-60 Fremont Street

LOS ANGELES
228-238 Central Avenue

Everything OPENLY PRICED in our Illustrated Priced Stock Bulletin

Steel Water Tanks
For High Buildings
For High Pressure Water Systems, Automatic Fire Sprinklers, etc.

ALSO:
Designers, Fabricators and Erectors of General Plate Work, including Hydro-Pneumatic Pressure Tanks, Hemispherical Bottom Tanks and Towers, Oil and Water Tanks, Pipe Lines, Etc. "Western" Corrugated Culvert Pipe

Western Pipe and Steel Company
OF CALIFORNIA
444 MARKET STREET
SAN FRANCISCO

1758 NORTH BROADWAY
LOS ANGELES

When writing to Advertisers please mention this magazine.
In specifying and laying "WOLVERINE" Maple Flooring in this building, the architect and builder have given this Community an economical, sanitary and lasting floor.

In public buildings, under heavy wear, "WOLVERINE" Maple Flooring gives satisfying results.

STRABLE HARDWOOD COMPANY
DISTRIBUTORS
STRABLEWOOD QUALITY HARDWOODS

When writing to Advertisers please mention this magazine.
English Casements and Windows
for banks, offices, schools, hospitals, etc.

for artistic residences and other substantial buildings
Made in varied designs to meet all conditions

CRITTALL
Steel Casements
CRITTALL CASEMENT WINDOW COMPANY
Manufacturers Detroit Michigan

Lupton Steel Sash Products

Lupton Steel Sash Products represent more than so many square feet of windows at moderate cost.
They represent an idea—the idea of health, good workmanship and efficiency, due to ample fresh air and light.
Let us tell you about the different types of Lupton Steel Sash Products and how they may be used.

Represented by
WATERHOUSE-WILCOX CO.
San Francisco Los Angeles San Diego
*J. McCRAKEN CO. H. G. LANAHAN & CO. F. T. CROWE CO.
Portland Spokane Seattle Tacoma

* In Warehouse Stock.

When writing to Advertisers please mention this magazine.
THREE-QUARTERS of a century has passed since the founding of W. P. Fuller & Co. in Sacramento in 1849. These years have been auspicious, for they have witnessed the steady growth and expansion of W. P. Fuller & Co. from a small beginning of one store to the present 20 co-ordinated branches located at strategic points on the Western Coast.

Small wonder that the entire paint and varnish products on these two model Sacramento school buildings should bear the label of W. P. Fuller & Co.

W. P. FULLER & CO.
Steam Heating
and Ventilating
For Commercial and Public Buildings
Furnace Heating for the Home

Mangrum & Otter, Inc.
827-831 Mission Street
San Francisco, Cal.
Phone Kearny 3155

S. & S. TILE CO.  A. L. SOLON and E.P.SCHEMMEL
MANUFACTURERS OF
HAND-MADE TILES FOR WALLS AND FLOORS.
REPRODUCTIONS OF OLD SPANISH AND
MOORISH GLAZED TILES.
Factory, 4th and Carrie Sts.  San Jose, Cal.

SASH CHAIN

Made of
“Giant Metal,” “Red Metal” and Steel

Further information on request
See page 943 Sweet's Catalog

THE SMITH & EGGE MFG. CO.
Bridgeport, Connecticut, U. S. A.

RAWLINS & SMITH, Coast Agents

507 Mission St., San Francisco
515 I. W. Hellman Bldg., Los Angeles

GLADDING, McBEAN & CO.
MANUFACTURERS
CLAY PRODUCTS

CROCKER BUILDING  SAN FRANCISCO
WORKS, LINCOLN, CAL.

When writing to Advertisers please mention this magazine.
The Residence of Mr. Herbert Hoover

SECRETARY Hoover’s California residence is a fitting tribute to the structural possibilities of Medusa White Cement Stucco.

Specifying Medusa Waterproofed White Cement means the safeguarding of ornamental concrete work against unsightly streaking and discoloration. Such work, if properly prepared and applied, will retain its original texture and color indefinitely, and may readily be scrubbed free from any surface deposits of dust or soot.

Medusa Waterproofing in concrete, added as an integral part of the cement, lines the tubes or pores throughout the mass with a water-repellent film that resists dampness permanently. Best results can be had by specifying Medusa Waterproofed Cements, either White or Gray. We are sole manufacturers of Waterproofed White Cement—ask for booklets.

Medusa White Cement and Medusa Waterproofing are carried in stock and sold by leading building-supply dealers in California, Oregon and Washington.

THE SANDUSKY CEMENT COMPANY
Department P
Cleveland, Ohio
Manufacturers of Medusa Stainless White Cement (Plain and Waterproofed), Medusa Gray Cement (Plain and Waterproofed), and Medusa Waterproofing (Powder or Paste).
The Ford car unfailingly answers the needs of the man who desires economical and dependable motor transportation.

The Ford is a valuable ally of the business concern and indispensable to the salesman or the sales force that wishes to cover an extensive territory at the least cost and with the greatest speed.

For eighteen years, we have catered to the needs of the Ford buying public. In our new location and our new building at 11th and Market streets we are in a better position than ever to serve.

Visit our new sales and service quarters. Night service in the garage.

William L. Hughson Co.

Since 1903

Market at 11th Street, San Francisco

Park 4380

Seattle Portland Oakland Los Angeles San Diego
TRULY a wonderful example of what an interested manufacturer may accomplish in collaboration with an architect. Those who have seen this marvelous color blend in Roman brick, one and one-half by twelve by three and one-half inches, have unhesitatingly pronounced it an advanced step in California craftsmanship and color. Here we daringly combined variegated buffs and browns with deep wine colors, all of rough texture. Joints were raked and brick laid as without tools. The composite color and texture scintillate with life, gripping every beholder where he lives.

Wouldn't you like to secure some new colors and ideas in brick work?

You are invited to visit our exhibit at 77 O’Farrell Street, San Francisco, after July First.

CANNON & COMPANY

Executive Offices and Works, Sacramento, Calif. 77 O’Farrell St., San Francisco
Send a sketch of your client's requirements and McCray engineers will gladly submit, without obligation, plans for specially built refrigeration equipment to meet particular needs. We carry in stock, for prompt shipment, refrigerators of all sizes and types. Get the latest McCray catalogs for your files.

No. 95—for Residences  
No. 61—for Markets  
No. 72—for Grocers  
No. 55—for Hotels and Institutions

McCRAy REFRIGERATOR CO.  
2261 LAKE STREET  
KENDALLVILLE, IND.

For large residences

The General Fireproofing Company
Manufacturers of
Herringbone Rigid Metal Lath, Corner Bead, Self Sentering, Peds, Diamond Mesh Lath, and waterproofing materials for Concrete

Write for booklet describing, and answering every possible question you may ask concerning the use of fireproof and waterproof materials

No. 20 Beale Street  
San Francisco

Telephone Douglas 6616  Piedmont 4955-W

The GOLD MEDAL MAIL CHUTE
INSTALLED IN
THE NEW
SAN FRANCISCO
CITY HALL
AND THE
WHITE MARBLE
MERRITT
BUILDING
LOS ANGELES

Given highest award at Panama-Pacific International Exposition 1915

Waterhouse-Wilcox Co.  
California  
Representatives
523 MARKET Street  
SAN FRANCISCO  
331 E. 4th STREET  
LOS ANGELES

F. T. CROWE & CO.  
Seattle, Wash.

The J. McCracken Co.  
Portland, Ore.

American Mailing Device Corporation

NOT ONLY MIXERS  
but a full line of nationally-known equipment, as well.
We have prepared for a brisk building season.

"Get it from BACON"

Edward R. Bacon Company
51-61 Minna Street, San Francisco
165 E. Jefferson St.  
Los Angeles

When writing to Advertisers please mention this magazine.
Soft Water at a Fractional Cost

Your client who desires complete comfort in his home will appreciate the satisfaction of having soft water at all times and at an almost negligible cost.

Wayne Rapid-Rate Water Softening Systems reduce hard water to absolute softness. These Systems require very little attention and occupy only a small space. No storage tanks. Made in domestic and industrial sizes.

Wayne engineers will gladly cooperate with you in working out any of your problems.

Wayne Tank & Pump Company
861 Canal Street
San Francisco Office: 534 Rialto Bldg.
Phone: Douglas 6397

Fort Wayne, Ind.
Los Angeles Office: 3311 West Temple St.
Phone: Wilshire 6401

Wayne
WATER SOFTENING SYSTEMS
Rapid-Rate

Fuller & Goepp
32 Page Street, San Francisco
Telephone Market 498

MANUFACTURERS OF
ART AND LEADED GLASS MIRRORS
Dealers in WHITE Glass for Table Tops, Counter Tops, Sink Backs, Etc. Complete Stock—Prompt Deliveries

Oakland Office, Jackson at 11th Tel. Lakeside 7272

When writing to Advertisers please mention this magazine.
Test Our Mettle

It's been the difficult jobs and the jobs done against the clock that have proved our capacity to FURNISH AND INSTALL

Steel Bars

Let us cite you the economy-erection figures accomplished on recent jobs in co-operation with architects and engineers.

444 Market Street
Phone Sutter 2720

STEEL BARS

Largest Stock of
Reinforcing Bars and
Fire Proof Material
on the Pacific Coast

TRUSCON DAYLIGHT SASH
All Sizes Carried in Stock
SAN FRANCISCO WAREHOUSE
TRUSCON STEEL COMPANY

CHAS. HOLLOWAY, JR., Branch Manager
527 Tenth Street, San Francisco

When writing to Advertisers please mention this magazine.
There is an old saying that "imitation is the sincerest form of flattery." Surely we, as manufacturers of 'Slidetite' should feel flattered for it has many imitators.

Unless an article possesses distinctive merit, there is no occasion for imitation. "Slidetite" does possess that sort of merit, and you will find it always gives genuine satisfaction. You'll never make a mistake by specifying "Slidetite" garage door hardware.

Write today for Catalog F-22

Sewage Ejectors Bilge Pumps
Condensation Pumps and Receivers
Return Line Vacuum Pumps
Horizontal Centrifugal Pumps

CHICAGO PUMP COMPANY
Telephone: Douglas 4220

GARNETT YOUNG and COMPANY
612 Howard Street, San Francisco

SEATTLE LOS ANGELES PORTLAND

When writing to Advertisers please mention this magazine.
The window glass throughout the splendid new Webster Hotel in Chicago is the product of the American Window Glass Company.

Distinctly a quality product, American Window Glass meets exacting requirements in double or single strength. Its evenness and freedom from imperfections invariably win it preference.

The American Window Glass Co.

General Offices, PITTSBURGH, PA.

Branches in leading cities as listed in Sweet's Catalog.

When writing to Advertisers please mention this magazine.
“Brands” vs. “Specifications”

A recent survey made by the McGraw Hill Publications of New York show that

Industrial Buyers of Paint Use in Their Painting
93% MANUFACTURERS’ BRAND

They have come to recognize the superiority of standard ready mixed paints over paints mixed on the job.

Bass-Hueter Paints and Varnishes are manufactured by the most approved methods under the supervision of the best chemists and paint experts in the country. They are products you are safe in specifying against paints for which you would have to write specifications.

So that you may readily recognize Bass-Hueter products which you have specified, we have adopted this trademark.

This is appearing on all Bass-Hueter Paint and Varnish labels. A few products which we particularly recommend are:

- Gold Seal Enamel
- Gold Seal Undercoat
- Satin Egg-Shell Interior Finish for Walls and Woodwork
- Concrete Wall Coating
- Flow-Lite Mill White
- Columbian Floor Varnish
- Interior Durable Wood Finish

Bass-Hueter Paint Company
SAN FRANCISCO

LOS ANGELES
PORTLAND

FRESNO
TACOMA

OAKLAND
SEATTLE

When writing to Advertisers please mention this magazine.
THE ARCHITECT AND ENGINEER

John Traynor

Charles Harcourt

OCEAN SHORE IRON WORKS

Manufacturers of
BOILERS, STEEL TANKS, STEEL PLATE SPECIALTIES
Dealers in
BOILERS, TANKS, PUMPS, ENGINES
GENERAL MACHINERY, ETC.

Office and Works: 550-558 EIGHTH STREET
Phones Market 462 and 463
SAN FRANCISCO, CAL.

MAGNESITE STUCCO
AND FLOORING

MAGNESITE WATERPROOF FINISH

DORITE
MANUFACTURED BY THE
DORITE MANUFACTURING CO.
116 UTAH STREET, SAN FRANCISCO

AGENCIES:
METROPOLITAN BLDG., LOS ANGELES 301 5TH AVENUE, N. Y.

CONTRACTOR’S MACHINERY

OSHKOSH PAVERS  OSHKOSH MIXERS
INSLEY GRAVITY PLANTS
OSHKOSH EVEREADY SAW RIGS  INSLEY STEEL CARS and TRACK
HOISTING BUCKETS, HOPPERS, GATES, ETC.
STEAM AND ELECTRIC HOISTS
EVERYTHING USED BY CONTRACTORS
CARRIED IN STOCK BY
GARFIELD & CO.
HEARST BUILDING, SAN FRANCISCO  PHONE SUTTER 1036

ALL CAST IRON—3 Sizes (3, 5, and 7 Sections)
RA-DO FUMELESS GAS RADIATORS
The Ideal “Year-Round” Heating System
For The Home—New or Old
Easiest and Cheapest to Install
Lowest Operating Cost

BAIRD-BALHACHE COMPANY
MANUFACTURERS
478 Sutter St., San Francisco  Phone Sutter 6858

When writing to Advertisers please mention this magazine.
Each shipment of "OLD MISSION" Portland Cement is guaranteed not only to equal but to surpass all requirements of the standard specifications for Portland Cement as adopted by the U. S. Government and by the American Society for Testing Materials. A Guarantee Certificate is mailed with the bill of lading of each car, giving number of car, date packed, and number of barrels, over the signature of the chief chemist.

SALES OFFICE:
MILLS BLDG., SAN FRANCISCO
PHONE SUTTER 3075

SALE:
SAN JUAN, CAL.
Safeguard your building — be it Factory, Warehouse or Power Plant — against spread of flames by specifying

 FYER-WALL
 ALL METAL DOORS & SHUTTERS

FIRE PROTECTION PRODUCTS COMPANY
FIRE DOORS—KALAMEIN—GENERAL SHEET METAL WORK
3117-3119 Twentieth Street, San Francisco

Metprodco Reversible Vents with Screens
are superior to all others, where economy, utility and service are factors.
Installed in our stock sash units. Can be operated with ease from any floor height without the use of mechanical appliances.

Manufactured by
United States Metal Products Co.
330 TENTH STREET
San Francisco, Calif.

HAUSER REVERSIBLE WINDOWS

BUSINESS COLLEGE, OAKLAND
Chas. W. McCall, Architect

EASILY OPERATED
PROVIDES SPLENDID
VENTILATION
MODERATE COST

WINDOWS IN THIS BUILDING
Manufactured and installed by

HAUSER WINDOW COMPANY
157 Minna Street, San Francisco

When writing to Advertisers please mention this magazine.
St. Genevieve
Clair—
A rich, light cream buff monotone marble. Taking a beautiful high polish — sound in texture.

SECURITY BANK, ST. LOUIS, MO.
(Entrance Vestibule)
Marble — Onondago

St. Genevieve
Golden Vein—
A dark cream buff marble with rich 'golden veining. A really beautiful marble of the highest grade.

CHAPEL, ST. LOUIS, MO.
(Halls and Corridor)
Marble — Onondago

Samples furnished on request

Tompkins-Kiel Marble Company
505 Fifth Avenue New York City
Chicago Philadelphia San Francisco
QUALITY HARDWARE

CORBIN

Locks and Builders' Hardware

PALACE HARDWARE CO.

"San Francisco's Leading Hardware Store"

581 Market Street, Sutter 6060

Kewanee Water System

Maintain your own Plant,
Small Operating Expense.
A Perfect Water Supply to
Country Homes, Hotels, and Parks.

Simonds Machinery Co.

117-121 New Montgomery St.
San Francisco
Phone Kearny 1457

UHL BROS.

San Francisco
Oakland
Seattle
Los Angeles
Portland

Pacific Coast Distributors
Murphy Varnishes and Enamels

For
Hotels
Apartment Houses
Hospitals
Factories
Etc.

Pack your Radiator Valves with
Palmetto Twist Packing

It can be unstranded to fit any
size Valve. It does not get hard

H. N. COOK BELTING CO.

401-433 Howard St., San Francisco, Cal.

When writing to Advertisers please mention this magazine.
The Latest Country House Color-schemes

An especially appropriate and harmonious exterior color-treatment has been developed for the dignified and beautiful type of country-house.

**Cabot’s Old Virginia White,**
for the walls

**Cabot’s Creosote Stains in greens or dark gray,** for the roofs

Walls finished with Cabot’s Old Virginia White
Roof finished with No. 346 Dark Gray Creosote Stain

WALTER BOSCHEN, Architect, St. Joseph, Mo.

The soft, brilliant "whitewash white" of the Old Virginia White is particularly suitable for this type of house, and the rich greens and velvety dark gray stains harmonize perfectly for the roof, with the old New England dark green blinds.


 Cabot’s Creosote Stains, Waterproof Cement, and Brick Stain
 “Quilt” Conserva Wood Preservative, Dampproofing
 Protective Paints, Waterproofing, etc.

Pacific Materials Co., San Francisco
Waterhouse-Wilcox Co., Los Angeles

S. W. R. Dally, Seattle
Timms, Cress & Co., Portland
Theo. F. Snyder, San Diego, Cal.

When writing to Advertisers please mention this magazine.
Richmond Rug Brick

All Architects know that in selecting face brick, they are not selecting an individual brick, but a wall of brick. The experienced Architect in selecting a brick, visualizes the completed wall and knows how it will conform to the surroundings and design of the structure. On the other hand, the average owner in making his selection, thinks only in terms of brick. Lacking the Architect's knowledge and experience, the owner very often makes his selection from individual samples and selects a brick unsuited for the purpose intended.

Having this in mind and with the idea of enabling the owner to get a better idea of the completed wall, we have laid up panels of RICHMOND RUG BRICK in various mortar colors. This will also give the Architect a better idea of the results to be obtained with RICHMOND RUG BRICK.

We would like the Architects to visit our display with their clients before making their selection of face brick as RICHMOND RUG BRICK are distinct in texture and color.

Richmond Pressed Brick Co. United Materials Co.
Manufacturers Distributors
Sharon Bldg., San Francisco, Cal. Sharon Bldg., San Francisco, Cal.
HUBBELL
"De Luxe" OUTLETS for Fine Buildings

Fig. 1: Two milled brass self-closing doors open inward as the cap blades are pressed against them.

Two-thirds actual size
Duplex FLUSH DOOR Receptacle No. 6755, with plate No. 6756—
assembled.

Fig. 2: With the cap fully inserted, each blade is firmly gripped on two sides by contact springs concealed back of two narrow slots in the porcelain body. Weak connections are impossible. When the cap is withdrawn, the doors automatically close, flush with the plate.

T HIS new electrical outlet for fine buildings has been designed to meet Architect’s requirements for a flush receptacle with the mechanism wholly concealed from view.

Electrical contacts can be reached only by the blades of each cap.

These FLUSH DOOR RECEPTACLES are furnished complete with brass-covered or all-composition caps. Brass plates are of standard size, in any finish desired. Receptacles bodies fit standard outlet boxes.

HARVEY HUBBELL INC.
ELECTRICAL SPECIALTIES
BRIDGEPORT, CONN., U.S.A.

A BULLETIN containing full information regarding our Electrical Wiring Devices, is in course of preparation. We will gladly mail a copy free to any architect requesting.

ELECTRICAL SPECIALTIES

When writing to Advertisers please mention this magazine.
Ray Rotary Fuel Oil Burners

For Steam and Hot Water Boilers

ADAPTED TO ANY TYPE OF BOILER OR FURNACE—High or Low Pressure, 10 to 300 H. P.

We pioneered and developed the horizontal type Rotary Burner. This principle is sound, as the trend of all burner design is toward this type.

Don't confuse the Ray with other Rotary Burners. We are the largest manufacturers of Rotary Burners in the world. Recent contracts of the Westinghouse Electric Manufacturing Company covered over four thousand motors.

The Ray Oil Burning system is covered by twenty United States Patents.

This represents ten years of research and development work.

Can you afford to buy experiments—just born? No matter what your troubles are we can eliminate them with the Ray system. We guarantee the Ray to be the most efficient burner on the market.

W. S. RAY MANUFACTURING CO.

Manufacturers of Ray Crude Oil Burners
Ray Oil, Gas, Coal or Wood Heavy Steel Ranges

OFFICE AND SALESROOM:
29 Spear St., SAN FRANCISCO
Phone Douglas 8079

PLANT AND SERVICE:
Bosworth, Milton and S. P. R. R.
Phone Mission 5622

OAKLAND DISTRIBUTOR:
The Ray Oil Burning Systems
F. L. Warner, Manager
Distributors 2206 San Pablo Ave., Oakland, Calif.
in all Principal Cities Phone Oakland 3944

THE COEN SYSTEM

OF

MECHANICAL OIL BURNING
(PRESSURE SYSTEM)

IS QUIET IN OPERATION AND THE
MOST EFFICIENT FOR HOSPITAL
POWER PLANTS


COEN COMPANY Inc.

112 MARKET STREET, SAN FRANCISCO
Phone Sutter 2838

Los Angeles, Cal. 128 Story Bldg.
Seattle, Wash. 303 Railroad Ave., South
Portland, Ore. 51 First Street

When writing to Advertisers please mention this magazine.
FAESS SYSTEM TURBINE FUEL OIL BURNER

"Worthy of your consideration"

We are the originators of the mechanical atomizing type oil burner and the largest exclusive manufacturers of oil burning equipment in the west. All parts of our equipment are manufactured in our own plant, thereby assuring prompt and efficient service at all times.

Specify "FAESS SYSTEM"—it has no equal

FAESS SYSTEM COMPANY, Inc.
218-220 Natoma St., San Francisco.
Phones Sutter 6927-6928

Agencies in all principal cities
Member of the Oil Burners Manufacturers Association of California

SIMPLEX BURNERS


BUNTING IRON WORKS
1215 FIRST NATIONAL BANK BLDG.
Factory BERKELEY SAN FRANCISCO Phone Sutter 3225
Member of the Oil Burners Manufacturers Association of California

OIL BURNER EQUIPMENTS

Low Pressure Air and Rotary Mechanical Atomizing Types
Refrigerating and Ice-Making Machines
Direct Expansion and Brine Circulating Systems

T. P. JARVIS MANUFACTURING CO.
CONTRACTING ENGINEERS AND MANUFACTURERS
275 Connecticut Street, San Francisco
Phone Market 3397
Member of the Oil Burners Manufacturers Association of California

JOHNSON'S ROTARY CRUDE OIL BURNER

Can be installed in any BOILER or FURNACE
Gives Satisfactory Results
Simple to Operate—Automatic—Safe
Let us tell you more about this Oil Burner.

S. T. JOHNSON CO.
1337 Mission Street San Francisco, Cal.
Ask for Bulletin No. 28 Phone Market 2759
Agencies: SEATTLE LOS ANGELES FRESNO SAN DIEGO SACRAMENTO
Member of the Oil Burners Manufacturers Association of California

When writing to Advertisers please mention this magazine.
Pump Governors
Oil-Burner Governors
Reducing Valves
Safety Valves
Oil Valves
Blow Off Valves
Boiler Feed Water Regulators

Oil Pumping Sets
Little Giant Improved
Oil Burners
Duplex Oil Pumps
Rotary Oil Pumps
Oil Heaters
Draft Gauges
Boiler Feed Pumps

G. E. WITT CO., Inc.
ENGINEERS
Manufacturers and Distributors
862-864 HOWARD ST. Phone Douglas 4404 SAN FRANCISCO, CAL.

ALL STEPS
Should be protected with an auto-slip safety tread.

"FERALUN" SAFETY TREADS
Pacific Materials Co., San Francisco

A. F. Edwards, Pres.
J. M. Fahlbrin, Vice-Pres.
J. A. Mackenzie, Secy.
Office Telephone Market 5070

Chas. F. Eisele, Asst. Mgr.
J. Rubiolo, Asst. Mgr.
D. A. Batsford, Asst. Mgr.

AMERICAN
MARBLE & MOSAIC CO.
25-59 Columbia Square, San Francisco, Calif.
Near Folsom St., Bet. 6th and 7th Sts.
Factory on Water Front, South San Francisco. Phone South San Francisco 161

DETROIT STEEL PRODUCTS CO., Detroit
Direct Factory Branch, 68 Post Street, San Francisco. Phone Sutter 1250

When writing to Advertisers please mention this magazine.
THE ARCHITECT AND ENGINEER

CONTENTS FOR JUNE, 1922

Fremont School, Sacramento, California . Frontispiece
Recent Work by Dean & Dean, Architects . . . 47
Irving F. Morrow
Why So Many Structural Failures? . . . . . . 82
Arthur H. Hemmles
Design for Los Angeles Hall of Justice . . . . 85
New Campus Plan for State College of Agriculture . 87
A Notable City Planning Project . . . . . . . . . 88
Insulating of Sound in Building . . . . . . . . . 92
Color in Interior Decoration . . . . . . . . . . . 94
John Chapman
Pier Failure Endangers Concrete Bridge . . . . 95
What Does “Rent” Mean? . . . . . . . . . . . . . 97
Edward M. Applegarth
Of Quantity Surveys . . . . . . . . . . . . . . . . . 98
John R. Wiggins
Some Thoughts on Cooperation . . . . . . . . . 101
Ernest T. Trigg
Editorial . . . . . . . . . . . . . . . . . . . . . . . 104
With the Architects . . . . . . . . . . . . . . . . . 108
With the Engineers . . . . . . . . . . . . . . . . . 112
The Contractor . . . . . . . . . . . . . . . . . . . . 114

Published Monthly by
THE ARCHITECT AND ENGINEER, INC.
626-27 Foxcroft Building, San Francisco

W. J. L. Kierulf Frederick W. Jones L. B. Penhorwood
President Vice-President Secretary
FREMONT SCHOOL, SACRAMENTO, CALIFORNIA
Hemmings, Petersen, Hudnutt, Inc., Architectural and Engineering Commission
Dean & Dean, Architects, Designers and Successors
SACRAMENTO'S school building program is in full swing, and a grateful sight it is, as one passes about the city, to encounter, at frequent turns, structures recently finished or still building. The sound, straightforward construction of the incomplete ones, no less than the beauty of design and finish of those completed, is genuinely refreshing to the architectural pilgrim. Many a community of equal size to the Capital, and some larger ones, have erected schools which are less well planned, less well designed, and less well built. The greater part of the recent building program was originally assigned to Messrs. Hemmings, Petersen, Hudnutt, Inc., Architectural and Engineering Commission. The actual design of the buildings is to be attributed to Messrs. Dean & Dean, who have since succeeded to the management of the work. The city is acquiring buildings which are from every point of view of commendably and consistently high quality.

All of the buildings (as far as I am aware) are of masonry construction—brick or hollow tile, in combination with concrete frames, concrete floors, tile roofs, and steel trusses over long spans, as in auditoriums, etc. All corridor walls to a height around the door heads are built of a buff hollow tile, left unfinished. The tile buildings have been plastered, with textures reminiscent of the Spanish plaster work so beloved of all who have felt the charm of the early California adobes. The brick buildings exhibit, from school to school, bricks of a delightful variety in texture, color, and form. This material is a local product, from the kilns of Cannon & Co., and no small part of the charm of the buildings is attributable to its beauty, and to the reserved and straightforward manner in which it has been used.

The planning of the buildings is clean, direct, logical. Standardization has been adopted to a considerable degree—a policy toward which the architect is inclined to be unfavorably disposed. Theoretical objections are only too easy to state. Problems rarely present identical conditions and requirements. Every site insists on its own peculiarities of

*Architect, Member of the firm of Morrow & Garren, Architects, San Francisco.
size, shape, grades, outlook, exposure, etc. Every building suggests, if it does not press, particular demands of its own which vary, however slightly, from those of others of its type. Would it not seem, therefore, that identical solutions must at some points allow lapses or inconsistencies?

Accepting standardization as a policy, one can not fail to admire the freedom with which the architects have moved within their standard. It has not stifled their spirit. Certain of the objections listed, of course, are eliminated to a large degree by the conditions of the problem. In Sacramento sites simply do not have peculiarities of size, shape, grade, outlook, and exposure. Possibly the City Engineer could adduce data proving the incorrectness of the statements; but surely one's impression is that all streets run in one of two directions at right angles one to the other, that all blocks are of equal size, and that the entire city and surroundings have about as much variation in grade as is admissible in a billiard table. Outlooks are likewise non-existent, save temporarily into fields on the present outskirts of the town, or into trees on the older streets. (It may be said in passing that these glorious elm and locust trees which arch over Sacramento's streets constitute a rare asset of beauty and comfort, and the tendency one notes to encroach upon them needlessly is nothing short of criminal). Under the circumstances, therefore, about the only peculiarity possible to a site is that it may occupy less than an entire block. A plan which is adapted to one site in the city is more than likely to fit any other equally well.

The varying plan requirements from school to school have been adroitely met by minor eliminations from or additions to the typical plan. Each building has likewise been given a physiognomy of its own by special details, brick sizes and colors, and elements of composition.
Here, however, one may note that the moment strict uniformity is abandoned a standard ceases to be a standard, and such advantages as standardization possess rapidly disappear. One may well question, therefore just what purpose has been served in the present instance by the adoption of the policy. One interesting and rather subtle result there is none the less. A large number of buildings is being built; buildings which, although scattered about the city, in reality are parts of one large program. It is a pleasant idea that, while each conserves its own touch of individuality, they should all be recognizable as being of the large program.

The simplicity and restraint which characterize every design are admirable. I have already alluded to the straightforward handling of the brick. Equally straightforward are both composition and detailing. Masses are simple, but never without grace. Fenestration is both logical and interesting—a combination only too rarely met in school house design. Rooms have been made amply light without depriving them entirely of walls. I do not know if the approved scientific formulae as to the area of glass have been embodied; but in any case the effect, both inside and out, is that the fenestration has been worked out by common sense and artistic sensibility rather than with a sixteen inch gun. Admirable scale is maintained. Poise is never lost. Dignity and intimate human charm are reconciled. The sense of solid achievement with an entire absence of striving gives the buildings an atmosphere of genuine importance. What is more, they "belong"; that is to say, they are entirely appropriate to their situations. Just what constitutes appropriateness in a town not three quarters of a century old, in a country of shifting and conflicting social traditions, may be an uncertain matter.
possibly one more than usually subjective. If one were pinned down to a definition it might be easier to proceed negatively, eliminating the inappropriate. It would undoubtedly be the part of wisdom not to attempt to restrict the appropriate to any single type of design. Certain it is that the new Sacramento schools impress me as entirely appropriate to their situations; and this sympathy, together with the satisfying solidity of their construction, gives them an air of having long been where they stand. The impression will enhance with age, for the buildings will wear and weather well. It is architecture which will require neither painting, washing, nor sand-blasting (even when a convention invades the city).

Those buildings which are old enough for plant growth to have begun to count have been helped to take their places by the landscape work of Mr. Frederick N. Evans, Superintendent of Parks of Sacramento.

The domestic architecture of Messrs. Dean and Dean is second to the school work in no respect other than in size. The designs are equally individual and the execution equally sensitive. The house of Mr. George H. Cutter in particular would be an asset to any city.

The following notes on the Sacramento schools have been furnished by the architects:

The total amount of the bond issue which was voted on October 18th, 1919, for elementary schools was $2,804,000. Of this about $500,000.00 was expended for sites, overhead, etc., leaving a balance of approximately $1,800,000 for buildings. The work of the Commission covered the recommendation as to location and size of sites and sizes of the buildings. Each building was then planned, insofar as was practicable, for an ultimate maximum size building which would accommodate twelve hundred pupils, the number that the District would probably have when it was entirely built up. The building that was then erected was a portion of this complete plan and all additions made in the future will work toward the maximum building as laid out.

The construction used in all of the new schools is one that is practically fireproof, the frame and floor slabs being of concrete with either brick or hollow tile and plaster exterior walls. The roofs are all of tile. The class rooms have all been arranged so as to have east light with the administrative and special rooms to the north.
Following is a list of the schools which have been erected, together with cost and a summary of accommodations provided:

Elmhurst School—$97,108; seven classrooms, principal’s office and teachers’ suite.
El Dorado School—$66,715; five classrooms, principals office and teachers’ suite.
Fremont School—$202,403; thirteen classrooms, four special rooms, principal’s office and teachers’ suite.
Jefferson School—$136,167; ten classrooms, principal’s office and teachers’ suite.
Newton Booth School—$177,990; thirteen classrooms, four special rooms, principal’s office and teachers’ suite.
Franklin School—$124,320; eleven classrooms, principal’s office and teachers’ suite.
East Sacramento School—$239,060; nine classrooms, five special rooms, auditorium, principal’s office, teachers’ suite, first aid and dental rooms.

HOUSES IN SOUTH CURTIS OAKS, SACRAMENTO
Dean & Dean, Architects

Bret Harte School—$184,600; eleven classrooms, six special rooms, principal’s office and teachers’ suite.
Leland Stanford School—$225,499; eight classrooms, eight special rooms, auditorium, principal’s office, teachers’ suite and first aid room.
Highland Park School—$135,561; eleven classrooms, four special rooms, principal’s office, teachers’ suite and first aid room.
McKinley School—$56,367; six classrooms.
Marshall School (additions and alterations)—$32,232; four classrooms.
Lincoln School (additions and alterations)—$36,853; four classrooms.

* * *

Elected President of Institute

The annual convention of the American Institute of Architects, held in Chicago the forepart of this month, honored San Francisco in particular and the Pacific Coast in general, by electing Mr. William B. Faville president for the year 1922-23. Mr. Faville was present and accepted the honor with characteristic modesty. He is junior member of the firm of Bliss & Faville, Architects of San Francisco.
TYPICAL SECOND FLOOR PLAN, ELEMENTARY SCHOOL (Showing Completed School)  
SACRAMENTO  
Hemmings, Petersen, Hudnutt, Inc., Architectural and Engineering Commission  
Dean & Dean, Architects, Designers and Successors
TYPICAL FIRST FLOOR PLAN ELEMENTARY SCHOOL (Showing Completed School)
SACRAMENTO
Hemmings, Petersen, Hudnut, Inc., Architectural and Engineering Commission
Dean & Dean, Architects, Designers and Successors
ENTRANCE DETAIL, NEWTON BOOTH SCHOOL, SACRAMENTO
Hennings, Petersen, Hudnutt, Inc., Architectural and Engineering Commission
Dean & Dean, Architects, Designers and Successors
ENTRANCE DETAIL, FREMONT SCHOOL, SACRAMENTO
Hemmings, Petersen, Hudnut, Inc., Architectural and Engineering Commission
Dean & Dean, Architects, Designers and Successors
ORIGINAL PERSPECTIVE, JEFFERSON SCHOOL, SACRAMENTO
Hemmings, Petersen, Hudnut, Inc., Architectural and Engineering Commission
Dean & Dean, Architects, Designers and Successors
ENTRANCE DETAIL. JEFFERSON SCHOOL, SACRAMENTO
Hemmings, Petersen, Hudnutt, Inc., Architectural and Engineering Commission
Dean & Dean, Architects, Designers and Successors
DONNER SCHOOL, SACRAMENTO, CALIFORNIA

Hemmings, Petersen, Hudnutt, Inc., Architectural and Engineering Commission
Dean & Dean, Architects, Designers and Successors
DONNER SCHOOL, SACRAMENTO, CALIFORNIA
Hemnings, Peterson, Hudnut, Inc., Architectural and Engineering Commission
Dean & Dean, Architects, Designers and Successors
EL DORADO SCHOOL, SACRAMENTO, CALIFORNIA

Hummings, Petersen, Rahnutt, Inc., Architectural and Engineering Commission

Dean & Dean, Architects, Designers and Successors
HIGHLAND PARK SCHOOL, SACRAMENTO
Hemmings, Petersen, Hudnut, Inc., Architectural and Engineering Commission
Dean & Dean, Architects, Designers and Successors
SECOND FLOOR PLAN. HOUSE OF MR. GEORGE H. CUTTER,
SACRAMENTO, CAL.

THE ARCHITECT AND ENGINEER
"FAIRCLIFFE," HOUSE OF MR. WM. H. DEVLIN
SACRAMENTO, DEAN & DEAN, ARCHITECTS
FLOOR PLAN: "FAIRCLIFFE." - HOUSE OF MR. WM. H. DEVLEN.

DEAN & DEAN, ARCHITECTS.

SACRAMENTO.
HOUSE OF MR. CHAS. F. DEAN, SACRAMENTO
DEAN & DEAN
ARCHITECTS
HOUSE OF MR. A. E. SOMERVILLE
DEAN & DEAN ARCHITECTS
Why So Many Structural Failures?
By ARTHUR H. HEMMLES, SACRAMENTO

MOST people, when reading of the ninety-eight lives lost in the failure of the Knickerbocker Theatre, Washington, D. C., and of the seven lives lost in the roof failure of the Brooklyn Theatre, wondered why some definite measure of precaution had not been taken to prevent such structural failures.

It would seem that the public has a right to know, not only why these named structures failed, but also why failures occur at all, whether or not they can be avoided. If structural failures can be prevented, the public should know the reason why they are not avoided.

After such disasters have happened, a criminal or civil court usually fixes the responsibility; some person or persons are blamed, the owner or owners of the structure, however, are often made to pay damages to those whose providers were killed. The claims thus appeased, things go on just the same as ever before.

Unless all architects and structural engineers desiring to practice, are given a thorough technical examination and upon having shown their fitness, are certified and by law held responsible for the work which they design, and that each certified person will be required to report to a state authority, any irregularity or deviation from his design which he deems dangerous to life; unless such a measure is provided, we know that the building industries are not safely operated. Through the efforts of the medical profession, the peoples of all civilized races have been taught to be cautious in many ways, and now thousand of lives are saved, that would, without certain knowledge, given to us by the teachings of that profession, be lost.

The architectural and the structural engineering professions, can, by united effort, educate the public, so that certain systems and laws are adopted, which will prevent reoccurrence of most of the structural failures.

It is true that an earnest effort has been made in some states to improve conditions by examining and certifying architects and engineers. There are many selfstyled “architects” and “engineers,” however, who do not understand the sciences underlying the knowledge of good practice in architectural and structural engineering.

For proper co-operation and coordination it will be necessary to appoint examined structural engineers of high standing, to positions of chief inspector of buildings and plan examiners for all cities, that such inspectors and examiners be held accountable to the state.

In order to obtain the highest grade of men for these positions, it will be necessary to pay reasonably good salaries and to separate the examinations and appointments as far as possible from politics.

It will be necessary to revise our civil service systems, for at the present time, some of the underlings representing civil service commissions in some of our cities, counties and states, are conducting examinations and reporting on the same in a manner that indicates they are merely pliable plastic putty in the hands of designing politicians, who use the present civil service as a clearing house of their line-up of waiting heelers.

Many structures that fail are not faulty in their original design; many disasters occur because an incompetent changes the design or detail, or the specifications are not carried out as intended by the struc-

---

1Mr. Hemmles is specification writer in the State Department of Architecture, Sacramento.
tural engineer and specification writer. This, of course, could be avoided by rigid inspection.

A large number of inspectors on jobs, are ordinary "experienced building mechanics," with no technical knowledge which would reinforce their practical experience. In a few cities, however, the inspector, appointed by the owner or architect, must meet with the approval of the chief city building inspector.

A state requirement, regulating inspections qualitatively and specifying the kind of construction upon which continuous inspection must be provided, would be an assurance that the safely designed would be safely built.

Certain states have laws which regulate hotel, apartment and tenement house building. These laws provide for fire protection, sanitation and preservation of good morals. Except for local city ordinances, the regulation of auditorium building has been quite ignored in legislation, though such construction is considered by experts to be the most intricate in the building line.

The hotel and tenement house laws have been the cause of great improvement in that class of buildings wherever these laws were enforced and there is no doubt that inspection and auditorium laws would be a protection and of great benefit to the public.

* * * *

Avoid Moisture Where Cement Surfaces Are to Be Painted

THE Research Department of the Bass-Hueter Paint Company contributes the following in regard to increasing the efficiency of painting on concrete or cement surfaces:

"As only partially satisfactory results have been enjoyed in the finishing of concrete and cement surfaces, the use of which is becoming more and more common, we are endeavoring to supply practical information in the hope of making better results possible. The principal drawbacks to successful painting on cement or concrete are moisture and "free lime." The former causes blistering and peeling, the latter destroys the oil in the paint. Free lime is gradually neutralized by exposure to the elements and, therefore, unless it is necessary to paint immediately, cement surfaces present more favorable painting conditions if so exposed for a year or so.

Since concrete floors, etc., cannot be subjected to the same conditions as exterior surfaces, satisfactory painting results can be expected only after every possible effort has been made to neutralize the free lime and to eliminate moisture. The latter is not always possible because many concrete floors in garages, factories, etc., are poured directly on the ground, and consequently the moisture is drawn back for some time through the floor by the warmer atmosphere.

Ordinary varnishes or sizes have no neutralizing effect whatever on cement or concrete surfaces; the action is purely of a physical nature. In view of these facts, it is always advisable to eliminate as far as possible moisture and to neutralize the free lime. Extensive research and experiments have developed that the lime is most satisfactorily neutralized by the proper application of a neutralizing coat consisting of about 8 ozs. Zinc Sulphate Crystals dissolved in 1 gallon of water. The combination thus formed is applied freely to the surface with a large brush and allowed to dry thoroughly before the application of the finishing coats."
Is There Anything to Say for the Cost-Plus Contract?

According to the National Federation of Construction Industries five to fifteen per cent of the total construction business in the country can hardly be done on any other basis than some form of cost plus. The next portion relatively greater by a considerable margin, is that which is usually done on a unit price basis, but which might be open for consideration on a cost plus basis. The remaining and greatest portion is now almost invariably done on a lump sum competitive basis. These proportions are not likely to be changed in any large way, but there is a great deal on a lump sum basis which ought to be handled on a cost plus fixed fee or cost plus percentage basis.

In commenting on this the Federation of Construction Industries states that there is no question but that the cost plus basis requires complete confidence on the part of the owner in the integrity as well as the competence of the contractor. Both were lacking in some of the contractors doing cost plus work during the war, and to this fact is attributable the bulk of the unsatisfactory results secured. Aside from this fact speed was a primary consideration and costs were deliberately put into second, third, or fourth place, for perfectly good reasons, but in the "cold morning after" analysis, costs were scrutinized first, and the erroneous conclusion drawn that the cost plus basis was rotten, led to graft and was open to so many criticisms that it was entitled to no place in the consideration of conservative business men.

The truth is that on any construction job on which the estimating is difficult, and on the average industrial plant, power plant, and buildings of any character costing more than $100,000, some form of fee compensation will produce more satisfactory results, 99 cases out of 100, than will the lump sum or any other form of contract, provided it is placed in the right hands. This last point is stressed by the Federation and made the basis of the success of the cost plus scheme.

Ask almost any man who has built a house during the last two or three years on a lump sum competitive basis, how much more it cost him than the contract price. It is hard to find a man who did not pay 25 to 100, and in some cases more than 200 per cent excess to get the house he thought he was buying for the face of the contract. In other words, a lump sum bid is in no sense a guarantee of the final cost.—Exchange.

* * * *

Keep Material Prices Down

A warning against increasing construction costs was voiced by leading general contractors from Los Angeles, the northwest, St. Louis, Chicago, Pittsburgh and New York, in session May 26th at Washington, D. C. They pointed out that if prices of material and labor are increased due to the great volume of construction now being started, stagnation and depression are sure to follow, similar to the depression in the construction industry in 1921, which followed the boom of 1920, when prices and wages went sky-rocketing.

The National Executive Board of the Associated General Contractors strongly urged that a reasonable stand be taken by all elements of the industry to keep costs at the lowest possible level if the great construction program needed by the country is to be carried through successfully.
Design for Los Angeles Hall of Justice

An example of what may be accomplished by the co-ordinated effort of a group of architects is found in the accepted design of the Los Angeles county hall of justice, made by the Allied Architects' Association of Los Angeles. This is the first time such a procedure has been tried. Some feared it would be a dangerous experiment. The result, as far as good feeling and co-operation among the more than a score of architects who participated in the work is concerned, is declared by them to have fully justified the effort.

The accompanying perspective drawing speaks for itself. It is a capital solution of a difficult problem and shows plainly the results of an intensive study. Note the treatment of the upper five stories which
will be devoted to the jail and the roof above the cornice combined with wall enclosing the main roof which will be used for exercising prisoners. As a study in proportion the design is impressive.

The architecture is described as a modified Renaissance reminiscent of a Roman Florentine, and to slight extent, of a Spanish tradition. The exterior will be faced entirely with limestone except for a granite base.

Preliminary plans were worked out by the supervisors in the county drafting room under the personal direction of Mr. J. H. Bean, the supervisor in charge of county building work. Finished floor plans are being completed in the same offices under the joint criticism of Supervisor Bean and executive officers of the Allied Architects’ Association. The exterior design, and the interior of the court rooms, staircases, corridors and elevators will be worked out in the drafting room of the Allied Architects’ Association, with Supervisor Bean representing the county.

Twenty-three architects submitted 27 sketches. These sketches were not presented to the supervisors, but were considered in an open meeting of the association. Each drawing was criticised by the first group after it had been explained by its author. A committee vote was then taken by the architects themselves. Each design was designated by a letter and each architect made a list ranking the sketches in the order in which he believed the work merited from 1 to 27. These votes added showed the relative composite rank of each sketch. The smallest total was 78 and the largest over 400, the smaller indicating the greater number of individual rankings in first or near first place.

The twenty-three architects were again asked to submit sketches on a larger scale after having been told wherein they had not fulfilled the county’s conditions, and having the benefit of the joint criticisms of their co-partners. All submitted sketches and the procedure was the same as in the previous competition. Voting disclosed that the same architect was not first the second time, but the first seven men were the same seven both times. These seven men were then made the committee on design with authority to elect a chairman to work under a committee of the board of directors. No member of the board was a member of the committee on design. At this stage the sketches were submitted to the supervisors for their criticism and suggestions.

Transferring the work from the several architects offices to the drafting office of the association where under a head draftsman and assistant, working through the committee on design, the agreed best elements in the most popular designs, were put together, was the next step in the general procedure. This required about sixty days and the accompanying design, approved by both the city and county in principle, was the product.

* * * *

Important Legal Decision

The architects sued to recover for services in the preparation of plans for alterations to defendant’s house. The defendant had abandoned the alterations and the architects declined to deliver the drawings to him, on the ground that they were following the rule of the American Institute that "drawings and specifications, as instruments of service, are the property of the architect." It was held, that while it might be true that where both parties knew of this rule and contracted in contemplation of it, the drawings would remain the property of the architect, yet, in the case in question, it appearing that the defendant was ignorant of the rule and that no such agreement had been made, the plans belonged to him and the architects could not recover without delivering the drawings.—American Architect.
New Campus Plan for State College of Agriculture at Davis

The new Campus Plan which is to govern the future growth of the branch of the College of Agriculture at Davis and which has been adopted by the Board of Regents as the official plan for that institution, has just been completed by Professor John William Gregg, Landscape Architect, and is now on display in the Director's office at Davis, where it is attracting a great deal of attention and receiving much favorable comment from all who are interested in the development of a greater institution for Agricultural Instruction and Research.

The plan itself is approximately five by seven feet in size and beautifully rendered in color to bring out the details of the main scheme which shows a practical but aesthetic grouping of buildings around a large central quadrangle which is balanced on Second Street of the town of Davis as a secondary axis and with a broad main roadway from the State Highway on the north determining the main axis.

The detailed arrangement of buildings is such as to eventually form group units with secondary quadrangles which are called for by the style of architecture which is to prevail and which is being worked out by William C. Hays, Architect of San Francisco.

Such utilitarian factors as convenience, accessibility, centralization of special and general types of instruction and research, comfort, and health have all been considered of prime importance in the study and preparation of the plan, which as it develops will gain great architectural and landscape beauty.

Already two new buildings, the Dairy Industries Building and the
Horticultural Building, are being erected according to this plan, and new sidewalks, curbs and roads are now under construction along the new lines with the result that the plan is already beginning to show definite results and furnish a visible suggestion of the future institution.

* * * *

A Notable City Planning Project

The largest single piece of City Planning by private enterprise ever undertaken in this country for permanent development will be the new Palos Verdes Project in Los Angeles now being financed through nation-wide underwriting. We have the great examples of Washington, D. C., and possibly one or two other cities well planned in advance and built by public enterprise, and our great expositions have furnished stirring object lessons in what can be done by working to a carefully pre-arranged plan, for temporary dream cities. Now, what city planners have long been urging for permanent city building, seems likely of early accomplishment.

The Palos Verdes Project contemplates a new suburb which, though much larger, will be similar to Roland Park, Baltimore; Forest Hills, L. I., and St. Francis Wood, San Francisco, except that there will be a greater proportion of low priced homes and home-sites. A marvelous piece of ground has been secured, containing 16,000 acres (25 square miles) and including almost 14 miles of ocean shore, at the southwest corner of the Los Angeles Metropolitan area, with Catalina Island opposite.

The underwriting calls for a total expenditure of $35,000,000, work to proceed as soon as $15,000,000 of this amount is available. Several million dollars has already been subscribed and it is expected that the fifteen million mark will be passed before summer. Preliminary estimates of improvements include the following items:

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Home Building fund</td>
<td>$5,000,000</td>
</tr>
<tr>
<td>Streets and roads (125 miles concrete-paved)</td>
<td>6,000,000</td>
</tr>
<tr>
<td>Sewers</td>
<td>1,800,000</td>
</tr>
<tr>
<td>Water System</td>
<td>1,650,000</td>
</tr>
<tr>
<td>Cost of land</td>
<td>5,000,000</td>
</tr>
<tr>
<td>Ornamental plantings, art Jury endowment</td>
<td>1,500,000</td>
</tr>
<tr>
<td>Hotels and clubs</td>
<td>2,000,000</td>
</tr>
<tr>
<td>Parks, schools and playgrounds</td>
<td>2,000,000</td>
</tr>
<tr>
<td>Three civic centers with business blocks</td>
<td>3,000,000</td>
</tr>
<tr>
<td>University</td>
<td>1,000,000</td>
</tr>
<tr>
<td>Transportation</td>
<td>4,000,000</td>
</tr>
<tr>
<td>Unapplied, taxes, etc.</td>
<td>2,250,000</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$35,000,000</strong></td>
</tr>
</tbody>
</table>

The $5,000,000 Home Building fund is expected to finance the building of several thousand houses, arrangement for second mortgage loans being provided in the Trust Agreement and title already being held to the land. It is proposed to use part of this for the organization of co-partnership housing, similar to that in England, in order to furnish working men's homes in quantity on easy terms, and with maintenance and upkeep provided. No buildings can be built anywhere on the property unless the plans are approved by the Art Jury, which will be a permanent body, endowed with sufficient funds to do real work. Restrictions will be similar to those of Roland Park, Baltimore.

The staff appointed to develop the project includes Messrs. Olmsted Brothers of Brookline, Mass., Chas. H. Cheney, City Planner; H. T. Cory, Chief of Engineering; Hunter Liggett, Supply Service; Myron...
Hunt, Chairman Art Jury, and others of national reputation. All funds are held and administered by the Title Insurance and Trust Co. of Los Angeles, as trustee.

New Material to Replace Lumber?

In the manufacture of Celotex from bagasse (the fibrous refuse of the sugar cane after the sugar juice has been extracted), the manufacturers have not only solved the problem of the disposal of bagasse, which hitherto has been burned, but they have given to the building trade a new building material that can advantageously replace lumber where used as an insulating material.

In the process of manufacture the bagasse goes through breakers, soaking-tanks, steam cookers, washers and beaters, and is automatically passed through the dryers and into the cutting-up saws. Though each board is of the gigantic dimensions 900 feet long and 12 feet wide when first manufactured, the saws divide it into lengths desired while the board is on the last lap of the journey, so that the lengths ordered emerge ready for storage or for shipment without loss of energy or time.

During the process, the long fibers of the sugar cane are firmly matted and interlaced, making a rigid board of 1/2-inch thickness. Thus Celotex is homogeneous, inasmuch as it is not built up of layers but is of a uniform structure throughout. In this respect it is unique, since most building boards are built up of layers of paper cemented or glued together.

The board is filled with minute air cells formed by the interlacing of the fibers, in addition to the presence of the cells in the fiber and pith of the cane. It is this cellular construction that makes it as light as cork, weighing only sixty-tenths of a pound per square foot.

Primarily, Celotex is an insulation board, in which capacity it functions in any part of the building. On the exterior it can be used as paneling, lapsiding, and sheathing, for it is the only board form of insulation with sufficient strength to supplant lumber in building construction. Its big, smooth surface, free of all cracks and knotholes, gives it an advantage that ordinary lumber can never hope to attain. Inside the building it makes an ideal plaster base, because plaster adheres tenaciously to its surface. It also makes a beautiful finish as a wallboard, whether painted, tinted or left plain.

In addition to being a building material and an insulator of high order, Celotex in all uses deadens sound and controls acoustics. Particularly is this true when it is used as a sub-flooring in walls or ceilings, or under linoleum or carpets, where it keeps the floors warm. Unlike lumber, it will not warp, split or crack. When it is in the process of manufacture it is treated with chemicals that make it waterproof.

Its cellular construction gives it insulation properties that are to be found in no other building material and will save one-third on fuel. It is impervious to decay. This is demonstrated by the raw material bagasse, which lies in open fields exposed to all weather for years without showing signs of disintegration. The only means of destroying the bagasse is to dry and burn it. These qualities make Celotex applicable for hundreds of other uses, such as insulating warehouses, refrigerator cars, fireless cookers, and, in fact, any construction that requires a light insulating material. In all its uses it is as cheap as lumber and yet carries with it many uses that lumber cannot claim.
Paris Plans Moving Sidewalks

In order to relieve the congestion of traffic in Paris streets, pertaining mainly to the central boulevards, it has been proposed to install a system of moving sidewalks which would facilitate the movements of pedestrians. The plan, project or theory at first was regarded with amusement or skepticism, but it appears that the municipal council is treating the matter seriously, as it has decided to open a prize contest for the best solution of the problem. Contestants must present projects comprising detailed description of the proposed system, estimate of construction and installation, designs and profiles drawn to convenient scale, expose of the practical working of the system, plan of stations and proposed manner of reducing noise. Prizes of 100,000, 50,000 and 30,000 francs are offered for the best propositions. If the city of Paris should adopt any one of the prize-winning projects it could (failing a mutual agreement with the author of the project) acquire full ownership for the fixed sum of 500,000 francs.

The contest is open to foreigners, subject to the approval of the administration, and the contestants must make special demand to the Prefet de la Seine at least three months before the close of the contest.

* * * *

Germans Plan First Skyscraper in Europe

A thirty story skyscraper—the first in Europe—will be erected in Leipzig, where for over 400 years merchants from all over the world have assembled twice a year, in spring and fall, to get ideas on new merchandise assembled there by thousands of exhibitors. The architect of the proposed building is Prof. Peter Behrens, who visited this country in 1913, having been commissioned by the German government to prepare plans for a new embassy building in Washington. The skyscraper will cost 250,000,000 marks.

* * * *

An Attractive Small Home

A
n unusually good example of what can be accomplished on a very narrow lot, is the residence of Mrs. Lynn Helm in Pasadena, by Witmer and Watson, architects, of Los Angeles. All the rooms are light and airy and have privacy, and there is a small terrace at the side of the house which really forms another room. A decorative fence screens this outdoor living room from the neighboring house and from the passers-by, and a bright awning enables one to have either sunshine or shade, according to weather conditions; opening from the dining-room, it forms an ideal place for afternoon tea or for al fresco meals.

This house, here illustrated by courtesy of California Southland Supplement No 1, “California Homes by California Architects,” compiled by Ellen Leech, is built of wide siding, but the majority of the residences erected by this firm are of brick or hollow tile, and at the present time they are working out, on several homes, the newest method of construction, hollow concrete. Most people think of concrete houses as being of necessity ugly, square and heavy, and of the type built by the hundreds for factory hands. One two-story residence, which is nearing completion, is in the Spanish style, with tile roof, patio, and attractive entrance, and has a most interesting wall surface, produced by the molds into which the concrete was poured. The house will be white-washed, with just a touch of color in the wash, instead of plastered, in order that this unusual texture may be retained.
RUSTIC BUNGALOW, PASADENA
Witmer & Watson, Architects

PLANS, RUSTIC BUNGALOW, PASADENA
Witmer & Watson, Architects
Insulating of Sound in Building

The demand for quiet rooms in hospitals, hotels and office buildings, the desirability of insulating music studios and other rooms where disturbing sounds are produced, and the necessity for solving other problems for the control of noise have led to repeated requests from architects and builders for reliable information on effective methods for insulating sound. A valuable bulletin on this subject has been published recently by the Engineering Experiment Station of the University of Illinois. In this publication, "Sound-Proof Partitions," the author, Prof. F. R. Watson of the university, presents the available information in a systematic way, giving the methods and results of various investigations relating to the action of materials on sound, describing practical installations of soundproofing, and setting forth in accordance with existing knowledge recommendations that may be applied where sound insulation is wanted.

The information in the bulletin was drawn from three sources: the theory of the behavior of sound waves, experimental investigations of the effect of materials on sound, and examples of sound-proof installations. The details of this information, while drawn from different sources and apparently unrelated, co-ordinate in a satisfactory way in setting forth similar conclusions.

Some of the more general principles and recommendations in the bulletin are stated in the following paragraphs:

Sound may be transmitted from one side of a partition to the other in three ways; it may progress through continuous air passages, it may pass as an elastic wave through the solid structure of the partition, or, by setting the partition in vibration, it may originate sound waves on the further side.

These actions are quite readily understood by remembering that sound consists of a series of compressions and rarefactions that progress rapidly through a medium without interruption unless they meet a new medium with a different elasticity or density. For instance, sound waves in air proceed without hindrance through air passages, such as ventilation openings in a partition. If, however, the passages are small in cross-section, as in the case of a porous material, the progress is hindered and a certain amount of absorption of the energy takes place, due to the friction set up between the vibrating air column and the sides of the pores.

In cases the partition is impervious to air, the direct progress of the wave is interrupted. A thin partition is set in vibration and thus originates new waves on the side opposite the incident sound. For a thicker, more rigid partition, the vibrations are smaller and a very considerable part of the energy is reflected. The transmission in this case takes place by compressional waves communicated to the solid material of the partition. The amount of energy thus transmitted is usually quite small.

In view of these considerations a sound-proof partition should be as rigid and free from air passages as possible. For effective soundproofing of a group of rooms, the partitions, floors and ceilings between adjacent rooms should be made continuous and rigid. Any necessary openings for pipes, ventilators, doors and windows should be placed in outside or corridor walls where a leakage of sound will be less objectionable.

In case the sound is generated in the building structure, as the vibrations set up by a motor fastened to the floor, the compressional waves
proceed through the continuity of solid materials. In order to stop them, it is necessary to make a break in the structure so as to interpose a new medium differing in elasticity and density. For instance, the vibrations of a motor may be minimized by placing a layer of hairfelt, or similar air-filled material, between the supporting base and floor. Where the machine is quite heavy, footings may be made of alternate layers of asbestos, lead and leather. Bolting through this material will reduce the insulation, because the vibrations in this case will pass easily through the bolts to the floor. The insulation should thus be left without any bridging over of the discontinuities. Air gaps in masonry will be effective if the air space is not bridged over at any point. A floor floated on sand, sawdust, or hairfelt would approximate this condition. The edges of the floor should be insulated from the walls by felt or similar material.

Especial attention should be paid to the ventilation system. All effective sound-proof construction either omit entirely a ventilation system or else construct it in some special manner to avoid transmission of sound. In some buildings air is supplied and withdrawn from rooms by individual pipes that are small in diameter and extend without break from the air supply chamber to the rooms. This results in considerable friction between the walls of the pipes and the air, with a resultant weakening of the sound waves. Without some efficient control of the transfer of sound through the ventilation system it is a waste of effort to construct soundproof walls, double doors, and other contrivances for insulation.

When soundproofing a building all details should be considered with respect to the likelihood of transmission of sound. Each room, as far as possible, should be made an insulated unit by means of air spaces or air-filled materials that separate it from surrounding walls. Pipes and ventilators should be so installed as to minimize the chance of transfer of sound. Patent doors are now available that will close the door space at top, sides and bottom. In case a troublesome sound is generated in the room, it may be minimized by installing absorbing material on the walls.

The absorption of sound is an essential feature for soundproofing. Reflecting sound and scattering it still leaves it with energy. It must be absorbed; that is, converted into heat energy by friction, before it is eliminated as sound. This means that carpets, furniture, draperies, etc., should be present, or if greater absorption is desired, hairfelt or similar materials must be installed.

The insulation of sound is a complex problem and a successful solution is obtained only when all the possibilities of transfer of sound are anticipated and guarded against. While many things may be learned from further experience and much may be gained from additional theory, enough has been revealed to give encouragement to the belief that soundproofing may be prescribed in the future with some of the certainty that now attends the acoustic design of auditoriums.

* * *

Centennial Exposition at Philadelphia in 1926

Architects, engineers and builders are manifesting considerable interest in the probable type of construction that is going to be followed in the layout of grounds and buildings for the Sesqui-Centennial Exposition, to be held in Philadelphia in 1926, in celebration of the 150th anniversary of the signing of the Declaration of Independence. A report has recently been published by a committee of engineers going into the various points
of construction, landscaping, transportation, communication, lighting, etc. It is a comprehensive and constructive document and may be obtained by those interested by addressing the Sesqui-Centennial Exposition, Bellevue Stratford, Philadelphia.

Mr. Cass Gilbert, well-known New York architect, recently addressed a meeting of Philadelphia business men on the subject of the Centennial, and the following extracts from his talk will be found of interest; emphasizing as they do the desire of this distinguished architect to have an exposition of inherent beauty:

"You are about to launch a great exposition here in Philadelphia. You set great standards in 1876, but those are no standards for today. It is up to Philadelphia to reach so far beyond the standard of any exposition that has followed the Centennial that whatever you do will stand for years as something that will inspire you.

"If you can make your exposition one of beauty, you will accomplish more even for those purely commercial phases of the exposition than they could possibly accomplish otherwise. Love of beauty is inherent in the race. The very impulse of the Sesqui-Centennial should be one of creating new and higher standards of beauty.

"The cost makes no difference. Build within the limits of your purse, but make beauty the keynote of all you do. Whatever you do let the subject be well worth the price. Philadelphia has the greatest opportunity to do a great thing than any city in the world has ever had, and I think she is going to realize it."

* * * *

Color in Interior Decoration

By JOHN CHAPMAN

FOR those lovers of beauty in color whose means do not permit the purchasing of Gainsboroughs for mural decoration, there is always the opportunity of transposing a color scheme from such masterpieces and recreating the same harmonies in interior decoration; which, in many ways is very similar to the painting of a picture. In both cases the "tout ensemble" has to be studied as well as the detail; lighting has to be considered just as much by the decorator as by the painter, and from these masterpieces of art one can acquire a sound knowledge of harmony and proportion of colors and lighting effects.

In decorating an Italian Renaissance home, for example, one gains a wealth of ideas by studying the color schemes of such masters of the art as Titian; his "Flora" or the "Duchess of Urbino" could be taken, and the color harmonies of these two beautiful works introduced into the decoration of the home; or for those lovers of more lavish coloring the Venetian school could be chosen and schemes arranged from the works of these princes of color, Tintoretto or Paolo Veronese.

One of the most successful means of acquiring the richness in color harmony of these masterpieces is by employing hangings or old brocades, damasks, velvets and embroideries. Many fine examples are coming to us from South America, whose grandees bought extensively from Europe in the past. On exhibition at the Lopez Studios, Pasadena, last month was part of a collection of antiquities belonging to Madame Julia Rodezno, whose knowledge of textiles extends deeply into the period and weave of the exquisite fabrics she has gathered from all over the world.
Pier Failure Endangers Concrete Bridge
A Lesson for Designers in the Settlement of the Foundation of an Arch Bridge in Arizona

The interdependence of superstructure and foundation was forcibly brought home to all designers by the failure of one pier of a concrete arch bridge across the Salt River at Tempe, Arizona recently. The bridge was built in 1911-1913 and is a link in the main highway route from Phoenix and the Salt River Valley to the eastern and southern portions of the state. It is crossed by about two thousand five hundred vehicles per day. There are eleven two rib, three-hinged arches with open spandrels and the spans are one hundred and twenty-five feet. Nearly all the piers were carried to rock in open excavation but some rested on concrete cylinders sunk to rock. It was one of these steel cylinders that settled.

The first settlement that was noticed was four and one-half inches at pier number nine, the second from the north end of the bridge. There was no interruption of traffic for several weeks when a further settlement of one-half inch occurred. A two-ton limit was placed on the bridge but three weeks later the settlement reached six inches and the bridge was closed to traffic. The following day there was a sudden drop of nearly five inches bringing the total settlement to nearly one foot. The pier also shifted down stream about 0.1 ft. Although the roadway had settled almost a foot, there were no cracks visible in the concrete in the region of settlement with the exception of handrails which were badly cracked. The longitudinal steel no doubt prevented the fine hair cracks from showing. Falsework was erected to provide a temporary support for pier number nine by means of heavy timbers and the bridge was thrown open to traffic in little over a month from the time the last settlement was noticed.

By sinking the foundation for pier nine to rock by using steel cylinders, the sand and gravel around the pier was left in its undisturbed condition and doubtless some of the load was carried by this gravel by way of the pier block which rested on the two cylinders. It was found on examination of the conditions at the base of the pier that all the sand had been scoured out with the exception of some thin layers over the bed rock, leaving the pier supported on the two cylinders, which proved inadequate to carry the load. In the light of difficulties subsequently experienced in sinking new cylinders it is very probable that the concrete in the base of the piers was of very poor quality or that a foot or so of gravel had filtered into the cylinder after the rock had been cleaned off. This would cause the crumpling of the steel at the bottom which is what actually happened, it is believed.

A number of other defects were found and it was thought advisable to do all the repair work at the same time. Several of the spandrel columns were broken in horizontal shear near the extrados and several spandrel walls near the crown had pulled loose from the arch rings. The roadway slabs and the spandrel arches were cracked completely through in a number of places and there was considerable trouble at the floor expansion joint.

As already mentioned emergency measures were taken, immediately after the last settlement had taken place, to stop any further movement of the pier. Sand bags were thrown around pier nine to prevent further scouring and towers were built at the crown of spans 7-8 and
10-11 with the object of saving the remainder of the bridge in the event of the spans on either side of pier nine going out. On account of the depth of the water it was found to be impossible to build supports any closer to the damaged pier. No settlement of the pier occurred after these supports were erected and later in the month piles were driven in the bed of the stream on which to place timber bents in spans 8-9 and 9-10. In this manner all the load was taken off pier nine and the work of underpinning was proceeded with.

The general scheme of repair was to sink six new cylinders, three on either side of the two existing ones, cut out parts of the pier block and insert reinforced concrete beams to transfer the load to the new cylinders. A great deal of difficulty was experienced in keeping the sand silt off the rock while the anchor holes were cut and it was found that grouting had to be resorted to in order that the cylinders could be pumped clean. The anchor bolts were then placed, the cylinders concreted up to the bottom of the pier block, and the reinforced beams placed from one cylinder to the other.

No effort was made to raise the pier or floor but the handrail was rebuilt to remove the appearance of sag and it is proposed to fill up the depression in the roadway with some kind of paving block.

While the failure is not considered serious, in that no lives were lost, yet the amount of time and money spent on the repair of this bridge certainly justifies the conviction that more care should be taken with the design and construction of projects of this kind. Although the bridge stood up for a number of years without any sign of weakness, it was only necessary to have scour take place around the piers to have one of them fail and the fact that a great deal of damage was not done can be attributed largely to the continuity of the minor structural elements and the possible lateral resistance of the soil around the piers.

* * * *

Exhibit of American Architecture

The exhibit of American architecture organized by the American Institute of Architects and displayed in Paris and London last year, has aroused so much interest abroad that plans are now being made for showing it in other European cities.

The Royal Institute of British architects has cabled Julian Clarence Levi, secretary of the committee of the American Institute of Architects, proposing a series of exhibitions in the larger English cities. Should this prove feasible there is a strong probability that the exhibits will then be sent to Italy and shown in Rome.

The exhibit comprises a large number of photographs of the most notable buildings in the United States and represents many American cities, New York, Philadelphia, Washington, San Francisco, Detroit, Indianapolis, Denver, state capitolts in Connecticut, Wisconsin, Missouri and examples of the architecture of American ecclesiastical and educational institutions.

It was shown at the annual exhibition of the Societe des Artistes Francais in Paris last spring and afterward under the auspices of the Royal Institute of British Architects in London.
What Does “Rent” Mean?

By EDWARD M. APPELGARTH

Secretary, Building Owners' and Managers' Association of San Francisco,
in Building Management

The word “Rent” as used today is too general a term to convey to
the public mind what such a payment represents in connection with
the Class A office building. Webster's New International Dictionary gives the following definition:

“RENT—The return made by the tenant or occupant of land or
corporeal hereditaments to the owner for the use thereof. A certain perio-
dical profit, whether in money, provisions, chattels or sources issuing
out of lands and tenements in payment for the use, commonly a certain
pecuniary sum agreed upon between the tenant and his landlord and
paid at fixed intervals by the tenant to the landlord for the use of land
or its appendages.”

In Nelson's Perpetual Loose Leaf Encyclopedia we find:

“RENT—The consideration paid by a tenant to his landlord for the
use and occupation of real property.”

In the Encyclopedia Britannica we find:

“RENT—Is a certain and periodical payment for service made or
rendered by the tenant of a corporeal hereditament and issuing out of
(the property of) such hereditament.”

Rents as they now exist in England are divided into two great claims,
rent service and rent charge.

A rent service is so called because by it a tenure, by means of ser-
vice is created between the landlord and the tenant. A rent charge is
the grant of an annual sum payable out of lands in which the grantor
has an estate. Rents in kind still exist, thus the corporation of London
is tenant of some lands in Shropshire by payment to the Crown of an
annual rent of a Fagot.

Peppercorn Rents—supposedly nominal, an obligation to pay 1 bbl.
of pepper consisted of a substantial impost even as late as the 18th
century.

In connection with the word “Lodger” in the Encyclopedia Britannica
we find it applies most frequently and properly “to a person who takes
furnished rooms in a house, the landlord also residing in the premises
and supplying him with attendance,” but we have no word which re-
prentates the idea of a payment covering both the bare use of real prop-
erty and in addition the receipt of certain service or services furnished
by the landlord. The only service mentioned in the definition above in
the Encyclopedia Britannica is the service of the tenant to the landlord.

On leaving a hotel the guest asks for his bill or statement of account
and he would not think of saying he wanted to “pay his rent” in fact
rent, as applied to a hotel, would be the payment by the lessee to the
lessor and you would not think of using it in connection with the pay-
ment by the guest to the management, but the general run of tenants of
office buildings use the word “rent” having in mind “the use and
occupancy of real property and its corporeal hereditaments” and have no
conception that the payment they make each month covers more than
Webster's definition conveys.

Webster says above “a certain periodic profit” which would be true
where the landlord gives the use of real property and its corporeal heredi-
taments, but does not necessarily follow where he pays out most of the
money received, and sometimes all of it for expenses.
The hotel guest knows his bill is for lodging and for services afforded by the hotel. It includes payment for light, heat, clean linen, the room furnishings, hot water, the use of the lobby, the services afforded at the desk to visitors enquiring for guests, the convenience of elevators with attendants subject to call, with telephone connections in room, with a dining room on the premises, with a readiness to serve meals or refreshments in the rooms, it includes safety afforded by the house detectives, the watchman and fire protection.

The word "Rent" is not used in connection with hotels and it should not be used in connection with office buildings. The reason a man will pay $15 a day for hotel accommodations and will say he is being robbed if asked to pay $3 a day for office building accommodations is that in the case of hotels he realizes he is paying for service for the care of the building and the character of the establishment. In the case of the office building he still thinks he is paying only for the use of the real property.

* * * *

Of Quantity Surveys*

SOME PROS AND CONS

By JOHN R. WIGGINS

ON REPEATED occasions I have presented to gatherings of builders, and particularly to representative members and to the executive board of the Associated General Contractors of America, the views I hold with regard to the practical application of the quantity survey and its effect upon the general contractors throughout the country.

In these friendly discussions, I have made a distinct effort not to consider the theoretical aspects of the question, but to confine my remarks to the practical side only. It may be of some service for the practical side of quantity survey to be summarized here, as I shall try to do in the briefest possible manner.

WHO IS RESPONSIBLE FOR ERRORS?

A number of questions immediately present themselves. The first concerns the question of responsibility by which we, as members of the Associated General Contractors of America, set so much store: Who is responsible for errors in the quantity survey?

We know that the owner, when he enters into a contract for construction work, will expect the contractor to be responsible. Most certainly he will not anticipate paying additional sums on the contractor's claim that the quantity surveyors made errors in their estimates. Naturally the contractor will not be willing to assume responsibility for errors by quantity surveyors, which raises the most practical question in the mind of the contractor, as to whether the quantity surveyors will be men who can take financial responsibility for their errors.

Those who favor the quantity survey state that firms will be organized with sufficient financial strength to be responsible for their mistakes, yet how can the surveyors be responsible for the ability of the contractor to complete his work with the estimated amounts of material? Will there not be a dispute between the contractor and the surveyor, if too great or too small a volume of materials should be called for by the survey? In the case of too small quantities of materials the

---

*Address presented before the General Session, Annual Meeting, A. G. C., Cleveland, Ohio.*
contractor will claim that the surveyor did not provide for sufficient material, while the surveyor will claim that the contractor used it wastefully. Disputes of this kind will complicate still further the already complex methods of carrying on a general contracting business.

**BURDEN ON THE CONTRACTOR**

As a matter of fact, are not the General Contractors of America the only really financially responsible parties in general contract work under the owner? In view of this fact, would not a contractor be arranging to play the part of the "goat" by the assumption of responsibility for work done outside of his office, outside of his supervision, and by people not of his own choosing?

After the quantity survey has been made, is it possible for any one in a builder's office to put a proper price on quantities, unless he personally goes over the plans to ascertain the character of the work covered in those quantities? And does he not thereby, through duplication of effort, increase rather than lessen the cost of estimating?

Further, can a builder who endeavors to live up to the magnificent slogan of the Associated General Contractors of America: "Skill, Integrity and Responsibility," be satisfied with so loose a method as having the men in his office price another man's quantities without thoroughly going over the same work as the quantity surveyor? Without this duplication of the quantity surveyor's work, the men in the builder's office, pricing the job, could not have a complete and intelligent conception of the work to be priced; and without this thorough understanding, they are not fitted to price the work at the low units necessary to secure a contract under close competition. Therefore, should pricing be done without the intimate knowledge to be gained only by going over the work of the quantity surveyor, higher estimates and increased cost to the owner will be sure to result.

The builder, who has accepted the ideals of the Associated General Contractors of America as his guide in business, looks with contempt on a competitor who is willing to reduce his estimates on a building because the owner or architect has informed him that John Doe will do the work so much more cheaply. Why then, should we not come under the same condemnation, if we accept figures of others, instead of ascertaining and making sure by our own personal knowledge what sum we are willing to place upon a certain piece of work?

**ARCHITECT'S TERRITORY**

I have been informed by a certain prominent architect in Philadelphia that when an owner asks him what general contractors do for the item in his cost make-up designated "Contractor's Profit," he, the architect, regrets that he is compelled to reply, "Nothing." It has been my practice, when I have been complimented on the beauty or layout of a building our company has erected, to reply that the credit belonged to the architect, for he had conceived the beauty of its appearance and designed its layout.

But it is my belief that a great majority of the architects of America have neither the organization nor the know-how to carry out the construction of the magnificent creations they have conceived. Now if it is the desire of contractors to help them to get together an organization and acquire the know-how, they can do so best by permitting the gradual elimination of the various departments that go to make up their organizations as a whole, and the final outcome will be that general contractors will be eliminated themselves.
PRICING CONTRACTS

Even the proponents of the quantity survey do not claim that under it the surveyors could price the jobs, in addition to taking off the quantities. As a general proposition, the quantity surveyor would not be in a position to price the work; not because of lack of native ability, but because of lack of experience, and particularly because the quantity surveyor cannot know how closely a builder can price the work.

Experience has proven the necessity of taking off the quantities and pricing them in the same office. In no other way, I firmly believe, can a builder successfully meet the hardpan competition of the present day, and in no other way can he uphold and augment the standing and efficiency of the general contractor.

* * * *

Rare Stained Glass Window

Pacific Coast visitors to New York will undoubtedly wish to view the famous Jesse window that has recently been installed in the Metropolitan museum of Art. The museum collection of stained glass has gained much distinction through the acquisition of this window representing the Tree of Jesse. The glass is composed of six large medallions with pairs of smaller medallions between, and measures 12 feet, 10 inches in height, 13\(\frac{3}{4}\) inches in width. This panel probably formed one light of a double or triple lancet-window. The glass has very little restoration and is in unusually good condition for work of such an early period. It was the rarest item in the Costessey Collection, formerly at Costessey Hall at Norfolk, England, a collection made in the late eighteenth or early nineteenth century. The provenance of the Costessey glass is unknown, but the Jesse window may be ascribed with certainty to the early Gothic period of the Lower Rhenish school (about 1300). It is exhibited in a small chapel-like structure in the mediaeval room, second floor, Wing J, where it is shown by artificial light owing to the present lack of space for exhibiting glass by daylight.

* * * *

Heatless Light

Heatless light, the goal toward which illuminating engineers have been working these many years, appears almost to have been attained in a new sort of light which has been developed by Professor Dussaud in Germany. The construction of the lamp is very ingenious. It consists of a number of mirrors and ordinary Tungsten filament lights. These lights are connected with the electric circuit through a rotating disc, fashioned from insulating material. The current is taken by copper brushes from copper plates imbedded in this disc, with the result that one light after another is turned on and off every second. Ordinarily this would result in a flickering light which would be altogether useless, but by a special arrangement of the mirrors the light is so concentrated that it appears absolutely constant to the eye. Not only is the amount of heat that is generated during the production of this light kept down to a minimum, but a great saving is also effected in the current consumption. Similarly, the burning out of the lamps is avoided and their life is increased very considerably. There is a wide range of possibilities for such a lamp in modern life.
Some Thoughts on Co-operation
By ERNEST T. TRIGG
President National Federation of Construction Industries.

It is likely that there was never a period in the United States, during times of peace, when co-operation of all the people was more needed than now. Contractors, artisans, bankers, railroad men, miners, farmers, women—indeed everybody—must join in unselfish, helpful, friendly, and intelligent co-operative effort, and maintain a magnanimous spirit one toward another, if we are to obtain for our country the prosperity and internal peace which should be the goal of all.

This is particularly true of those connected with the construction industry. The condition of this industry, and particularly the building branch, has probably larger and more potent possibilities of influence upon the business and industry of the country as a whole, than any other division of productive activity. It represents, next to agriculture, the greatest classification of industrial activity in the country, and is the industry through which the permanent wealth of the country is largely created.

We are now in process of endeavoring to re-establish a proper balance in construction, and to readjust prices and production to points where construction may be renewed economically in sufficiently great volume not only to supply the normal needs of the people, but to make up the shortages caused by the unbalanced activities of the past few years. This is a large project, and only through co-operation and by all working harmoniously together can it be carried out properly.

But in the great work of reconstruction it would be unwise for us to aim merely at a return to pre-war activities. There have been various undesirable influences at work for a score or more years which, in many cases, have been intensified by the war, and certain unsatisfactory conditions and practices have been permitted to continue with little or no change to the present time. It is a few of the problems caused by these influences and conditions, and of the kind of co-operation that seems essential for their solution, that I speak today.

One thing seems very evident,—that before we can look for a permanent revival of CONSTRUCTION ACTIVITIES, we must as an INDUSTRY, justify to the Public a full confidence in values, and that means to a large degree,—that we must earn and be entitled to their confidence in our practices and in our performance. Unfortunately, perhaps due in a measure to the nature of the Construction Industry, there have been in the past in some instances, aggravated examples of collusion resulting in unnecessary delays and expenses, which the Public has had to pay for. We can never hope to enjoy that full warranted confidence of the Public until all wrong, unfair and unnecessary acts on the part of any branch of the Industry are eliminated and we deal with the Public in an earnest, honorable, open way and give them full value for their money invested.

I do not believe that the practices which fair-minded men in the Industry condemn, have been general because I do believe that the great majority of persons, including labor,—actively and directly engaged in the Construction Industry, are just as honorable and fair as are the men in any other line of activity. It is, once more, a case of the actions of a few selfish and narrow-visioned men who have for their own immediate and temporary gain, brought more or less general disrepute on an entire industry.
In the matter of home-building—of which there is such a great shortage, we know that since the signing of the Armistice there has not been a general return of activity because prospective buyers have not had sufficient confidence in the stability values. There are three outstanding elements entering into the cost of constructing a home. I refer to the cost of such financing as is required; to the cost of materials, and to the cost of labor. Fortunately, the cost of getting the money necessary is, today, on a reasonable basis and speaking generally, home-building can be financed without exorbitant charges. Many material costs have been reduced to a reasonable level, in some instances below the cost of replacement. Other building materials are still high and the manufacturers of such materials will sooner or later, be obliged to realize that they are not only retarding their own activities but that they are holding back business possibilities on the part of other building material manufacturers who have reduced their prices, and that they are keeping engineers, architects, contractors and labor from useful occupation, and adding materially to our NATIONAL UNEMPLOYMENT PROBLEM.

Labor in some centres has been wise enough to accept reasonable reductions but so far as the building trades are concerned I do not think this is generally true. I am not an advocate of hiring labor at the lowest figure to which it can be driven. I believe that labor should receive a compensation sufficient not only to take care of the necessities of life, but to enable the family to provide proper education for the children, to enjoy some of the comforts of the modern day and to have a little left for systematic saving. I have advocated this for over a year and have yet to find a contradiction of the righteousness of this basis, from any reliable source. In considering the Building Trades specifically, it must be remembered that employment is not of the continuous, all-year-round, every-day-in-the-week nature that exists in the over-statement. in the readjustment of wages in the Building Trades. I feel that the rates paid to so-called Common Labor should more closely approach the rates paid to skilled labor than in the past. We all remember how prior to the World War common labor often times was paid as low as 17½¢ an hour and in some communities even less. On the basis of a ten-hour day and four day a week, this meant that many a husband and father went home to his wife and growing family with only $7.00 in his pocket to cover 7 days' expenses. We can all realize what this means and it is very much to be desired in my opinion, that we do not permit the wage of common labor in the Building Trades to again come down to the low point of the past.

On the other side of this question we are now confronted with organized groups of working men in some localities, who it is stated by their leaders, refuse to accept a reduction in their wages from the peak rates of 1920. This sort of a policy cannot prevail eventually and adherence to it simply means a delay in the inevitable readjustment and means not only unnecessary continued stagnation in building activities where it exists; but means great suffering and a great economic loss to everyone involved. I have faith in the fairness and in the good, common-sense of the great majority of our working men and I hope that the time is not far distant when this good, common-sense is going to assert itself in the communities not yet readjusted, to the end that labor may do its part to encourage the return of confidence in the Building Trades as a whole and a return of genuine and permanent activity.
The construction industry presents an unusually complex problem, because the contractor, as a rule, maintains only a skeleton permanent force, while the great bulk of the employees under his direction rapidly change in personnel. Under these conditions it is a matter of extreme difficulty for a single employer to build up the substantial and reliable forms of contact between himself and his workers which are to be found in many of our best-managed and controlled industrial establishments having plants in fixed locations and carrying on a more or less continuous operation.

The problem is, however, in many respects, one for community co-operation. I feel strongly that each community should have a committee of employers, engineers, architects, and others, to which is delegated the specific problem of endeavoring to develop plans under which the investor, the architect and engineer, the employer, and the workman, may safely join in agreements that there shall be no stoppage of work in the nature of strikes or lockouts as methods of settling differences, and that there shall be no discrimination in employment as between union and non-union men. An integral and co-ordinate part of the Committee's work would be to endeavor to set forth means whereby justice and fair dealing will prevail in a way to protect those who have entered into such agreements.

There is reason for the expectation that methods may be developed through these means which will, at least in a measure, eliminate the enormous costs, to all affected, of artificial stoppage of work through labor troubles; reduce the antagonisms and lack of loyalty which so often exist in the construction industries; and replace the latter by goodwill and frank understanding between employers and employees. Is there not reason to believe that if this subject is entered into with a distinctly co-operative spirit, and with intelligence, by a community, the results will be worth while? Certainly the best interests of employers and employees as well as the public will be conserved if success is attained in this direction.

* * * *

Elihu Root Receives Medal

In recognition of Elihu Root's services to the commission which undertook the rehabilitation of Washington, D. C., on the original design of L'Enfant, a group of artists and architects on May 3 presented a gold medal to him at a dinner in the University Club.

"Mr. Root has a long and extremely important record in his efforts in behalf of American architecture," said John Mead Howells, president of the American group, in a statement telling of the honor: "Mr. Root, Mr. Roosevelt and Mr. Taft were responsible for the rehabilitation of the original plan of Washington, D. C., designed by L'Enfant and approved by Thomas Jefferson.

"It was, however, Mr. Root's untiring support which made possible the work of the commission, consisting of McKim, Burnham, Olmstead and Saint-Gaudens. As Secretary of War and Secretary of State he did everything in his power to drive as many stakes as possible in pinning that plan to the District of Columbia, to use his own words.

"Mr. Root also made possible the establishment of the National Commission of Fine Arts in Washington, and he helped to organize the American Federation of Arts."
Uniting the Construction Industry

For the first time in the history of American industrial development a great industry has united all its elements—manufacturers, labor, and the professional branches—in a great effort to raise the standards and efficiency of the industry and improve the service which it renders the public. The nearest precedent is that furnished by the selection of Mr. Will H. Hays as arbiter of the motion picture industry, but the American Construction Council, on which the organization details are now being completed, goes much farther. It dips down into the industry and brings together for conference, for betterment of understanding and for common action the architects, the engineers, labor contractors, materials manufacturers and dealers, bankers and insurance men—all elements concerned with building work of any description and with the construction of public works, railroads, bridges, irrigation works, etc.

It is stipulated that all the work of the Council must square with the public welfare and so dominant has this idea been in the preliminary conferences that Secretary of Commerce Hoover, seeing the benefits that will result, has taken the responsibility of presiding at the formal organizing meeting in Washington, D. C., during the current month, and Mr. Franklin D. Roosevelt, of New York, former Assistant Secretary of the Navy, has accepted the presidency of the organization.

The possibilities of the new organization are tremendous. If the reader were asked to tell what construction really is, the reply would probably be, “housing” or “plant construction and commercial building” or “highways and bridges, railroads and canals” or perhaps “terminals for railroads and ship traffic or irrigation and reclamation projects.” Yet all of these are merely divisions or classifications of a single industry and should be included in the thought of the whole.

Instead of thinking of the building of houses as the individual expression of the fancy of the individual citizens, of the building of highways and railroads as merely the means of an industry we call transportation, of factory building and hydro-electric construction as isolated enterprises embarked in by isolated groups of individuals for private gain, we must think of construction as we do of agriculture, or of mining, or of manufacturing—as one of the great creators of permanent wealth, as one of the foundation stones in our civilization on which our progress is built.

Already indications of this are
evident. Construction reports have become equal to crop reports as barometric indicators of the material prosperity of the country. On their rise and fall depends the well-being of millions of our people, the success of great enterprises, the future welfare of our citizens.

One great problem stands ready for effective handling. It is the shortage of building mechanics, and the labor organizations need help in establishing necessary apprenticeship system. Mr. Hoover's department is making a national study of building codes, and when its work is completed there must be a nation-wide activity to carry the recommendations into effect—a type of activity which the new organization is designed to promote. In its organization the cardinal feature of the Council lies in giving each group equal voting power. The ten groups agreed upon are: Architects, engineers, construction labor, general contractors, sub-contractors, materials and equipment manufacturers, materials and equipment dealers; bond, insurance and real estate interests; construction departments of public utilities, and the construction departments of federal, state and municipal governments. Some of the associations engaged in the organization work have been the American Institute of Architects, the Federal American Engineering Societies, the Building Trades Department of the American Federation of Labor, the Associated General Contractors, the National Federation of Construction Industries, the National Building Congress, the National Association of Building Exchanges, the Building Trades Employers Association, the National Real Estate Board, besides a large number of associations of manufacturers.

With this strong backing the organizers feel confident that the American Construction Council will quickly be able to play an important part in the industrial life of the nation. Work of great magnitude lies right at hand, crying for attention. The public demands that the industry square itself with the public interest by eliminating the minority that have brought it into ill-repute. The individual elements of the industry are aroused to the responsibility which it owes the public and to the opportunities for elimination both of duplicate association efforts and of wastes in construction operations.

The time is most propitious for action.

Notes and Comments

GUARD AGAINST ACCIDENTS

During these days of building construction on a large scale in both Northern and Southern California, extraordinary precautions should be taken to prevent accidents. These precautions are necessary even when business is dull, but in boom times there is more of a tendency to put applicants to work simply because they apply. Only experienced mechanics should be employed in erecting and installing the equipment to be used on each job. There is need of adequate inspection and testing. There are too many deaths under the construction heading. Men fall from scaffolds, sometimes because there are no safety supports. Provision to prevent falling objects striking men below should be one of the first factors in making places of employment safe. Especial care should be taken by superintendents and foremen to properly supervise each installation designed to carry men and material. The Industrial Accident Commission has neither men nor money to enable its Safety Department to adequately guide the important work. It is positively necessary for the contractors, all
in authority, and the employees themselves, to do those things that will mean the clean record. There are a sufficient number of risks on each construction job without needlessly adding to the number. The employee who disobeys orders or instructions, or fails to do his work in the careful way, is a menace to himself and to all the other men on the job. The General Construction Safety Orders promulgated by the California Industrial Accident Commission, should be made the minimum standards.

* * *

NATIONS AMAZING WASTE IN BUILDING MATERIALS

The aggregate annual repair bill of home-owners in this country will this year amount to $540,041,769 for one item alone—the replacement of rusted sheet metal work, including leaders and gutters, valleys and flashings. This is the outstanding fact brought out by a survey just completed by the Copper & Brass Research Association.

It is estimated that there are in use in this country at the present time 5,175,000,000 feet of leaders and gutters and that about one billion feet is renewed annually.

The cost of replacements of rusted iron and steel pipe in plumbing is placed at $86,500,000 annually, making a total annual rust bill of approximately $626,500,000.

Of every dollar spent in residence construction, 36.1 cents is spent for masonry, 29.1 cents for carpentry, 8.7 cents for heating, 6.5 cents for painting, 6 cents for electrical work, 6 cents for plumbing 3.5 cents for sheet metal work, 2.9 cents for roofing and 1.2 cents for hardware.

The survey shows that the four last named items plumbing, sheet metal work, roofing and hardware, are the heaviest contributors to the nation’s annual repair bill.

It is estimated that between four and five billion dollars will be spent this year in new construction, a large part of it residential. Of this amount, approximately $240,000,-

**THE CIVIL ENGINEER AND RADIO**

(Engineering and Contracting)

The American Indian is usually taciturn. From which it is perhaps inferable that talking is an art that does not reach perfection among races that live out of doors. Talking has been called the greatest of indoor sports. Certainly the tongue seems to attain its extremes of dexterous flexibility among peoples who abide much under a roof. Since women usually live more indoors than do men, we should expect to find them more addicted to lingual athletics than are men.

Having thus established at least a presumption that wordiness and indoorness go together, we are better able to understand why relatively few civil engineers are fluent talkers. The life of the average civil engineer, at least during his habit-forming years, is largely a life in the open. If this tends to make him diffident about trying to convey his knowledge to others, it has at least the merit of causing him to keep also his ignorance to himself. And what a wordful of ignorance is daily talked and printed.

There has been not a little worrying over the volume of printed matter that is annually produced. Already the literary accumulation is so vast as to daunt the student who seeks a broad education by reading. And now comes radio, with the promise (or is it not really a threat?) that the frozen language of a million authors be thawed from its print and caused to flow forth in spoken words to every corner of the world. Even the taciturn civil engineer in his quiet con-
struction camp at night is to have lectures and sermons broadcasted upon him. Vanish for him the meditative hours, and in their stead the rattle and roar of talk, the tongue attacks of thousands of trained speakers. No more will future generations be able to say with truth:

Great teachers had I in my youth.
The silent, speaking things of nature,
And solitude that taught me thought.

A SCHOOL FOR APPRENTICES

The Industrial Association of San Francisco, which has charge of the labor relations of the section of the building industry operating under the open shop, has been giving considerable time to the problem of the shortage of skilled labor, which is becoming nation-wide.

The direct method of dealing with this shortage was considered to be the best one and a trades school has been installed which will eventually provide courses in most of the skilled building crafts.

The first group of student apprentices to be organized is taking up plastering. This class has been holding daily lesson for more than a week and splendid progress is reported.

There were seventy-five applications for training but for the start twenty-five were thought sufficient considering the facilities ready at that time. More will be taken in at the beginning of the next term.

All enrolled students were required to pass the army “beta” psychological test and physical examination as it was not thought desirable to waste instruction on persons incapable of profiting by it.

An allowance for married men of $2.50 a day has been provided but single men are not being paid. Tuition in all instances is free and buildings and working material have been arranged for by the association.

To start the plastering school a structure containing 9,200 feet of floor space was secured. Boy's and breasts were constructed in order to provide the maximum amount of wall space and one competent instructor placed in charge of the first class. Another teacher will be added shortly.

The school operates five days a week, eight hours a day. A complete training course of twelve weeks will turn out competent tradesmen according to the schedule laid down. Apprentices not progressing satisfactorily will be given extra consideration until it is shown that they are not suited to the work and then they will be discharged.

Of the twelve weeks included in the course, four weeks will be taken up learning to handle tools. Rough brown plaster will be used during this period and all the various tools in the plasterer's chest will be handed out and the students drilled in their use until they become quite proficient. As soon as the wall space is filled up the ornamental division will take up practice. Instruction in running molds, cornices, mitering and other fine work will be given.

High grade white plasters will be used during the last eight weeks and all sorts and grades of material will be discussed and explained to the class.

May 15 the plumbers' school started its course. The schedule for this class has not been worked out as yet and it is thought that more time may be needed to turn out a finished craftsman than with the plasterers.

In a short time schools for painters, bricklayers, tile setters, and metal fitters will be established and plans are already well under way in all of these branches. The experience gained in the divisions now at work and to be soon started will guide the Industrial Association in starting classes in all the other building crafts where shortage is liable to occur.

To Promote Art in Industry.

The question of whether the spirit of living art can be brought into the manufacture of the things of everyday use in America was discussed at a meeting in the Newark, New Jersey, Museum last month. The general opinion was that it could. A committee was appointed to gather information on what is now being done in the United States to promote art in industry. This committee is to report to a meeting later in the year, which will be called to consider plans for the founding of an industrial arts museum, and for the organizing of a national industrial arts association made up of manufacturers, artists, designers, craftsmen, workers in shops and factories, and distributors and retailers of manufactured good.

Will Design Federal Hospital

Mr. Matthew O'Brien of San Francisco has been selected as architect for a $2,000,000 hospital for tubercular war veterans, to be built at Livermore. The money for construction was provided by the Langley bill, passed in April, setting aside $17,000,000 for the construction of hospitals for ex-service men. The hospital group includes about twenty-seven buildings.
With the Architects
Building Reports and Personal Mention of Interest to the Profession

Store and Office Building.
Plans have been prepared by Architect William H. Weeks, 399 Pine street, San Francisco, for a $50,000 store and office building to be erected in Watsonville for Mr. Otto Stossel; also a two-story frame and plaster apartment house on College avenue, near Ashby, Berkeley, for Dr. Campbell. Mr. Weeks has been commissioned to prepare plans for the new school buildings at Santa Rosa for which bonds amounting to $375,000 were recently voted. Plans have been completed in the same office for a two-story reinforced concrete domestic science wing to the Mount Diablo Union High School, Concord. This structure will cost $90,000.

Will Judge War Memorial Plans.
Messrs. Ellis F. Lawrence of Portland, W. R. B. Wilcox of Seattle and Bernard R. Maybeck of San Francisco sailed May 31st for Honolulu to act as judges of plans in the architectural competition for the territorial war memorial natatorium to be erected in the Hawaiian capital. This memorial will consist of a natatorium modeled after the Greek pools of antiquity. The Hawaiian legislature has authorized a bond issue of several hundred thousand dollars for the memorial. The architectural adviser is Mr. Louis C. Mullgardt, former San Francisco architect, who is now traveling abroad.

Country House.
Architects Julius Kraft & Sons, Phelan building, San Francisco, have completed plans for extensive alterations and additions to the country house at Hillsborough for Mr. W. H. Talbot of Pope & Talbot, San Francisco lumber dealers. The style of architecture will be English Tudor and when completed the new home will have forty or more spacious rooms. The same architects have completed plans for a two-story building on Minna street, near Third, for Mr. D. J. O'Neal and for extensive alterations and additions to the Wellman, Peck building. The cost of the latter work will exceed $100,000.

Binder & Curtis Busy.
New work in the office of Architects Binder & Curtis of San Jose includes a six-story class A store, office and club building for the San Jose Commercial Club, estimated to cost $250,000; a two-story reinforced concrete chapel and classroom building for the Christian Assembly, formerly the Home of Truth, to cost $50,000; a two-story reinforced concrete ward building at the County Infirmary, San Jose, to cost $100,000, and a large Colonial residence for Mr. F. A. Wilder of the Pratt-Lowe Company, to cost $25,000.

Mr. Donovan Honored.
Mr. John J. Donovan, Oakland architect, has been invited to give a course of lectures on “The Practical Side of School House Planning” during the summer session of the University of California.

This course is intended for school executives, superintendents, principals preparing for administrative work, and others interested in the problems of school building. Lectures, discussions and stereopticon views and films of the important details of school building will be used in presenting the problems.

Telephone Building Addition.
Plans have been completed by Mr. E. V. Cobby, engineering department, Pacific States Telephone Company, San Francisco, for an additional story to a telephone exchange on Bush street, San Francisco. This addition will provide for one of the most elaborate private cafeterias on the Pacific Coast, having accommodations for 700 girls. Electric equipment will be used throughout, including ovens, washing and drying machines, cooking utensils, etc.

Appointed Assistant Professor.
Mr. James Chilman, Jr., has been appointed Assistant Professor in Architectural Design at Carnegie Institute of Technology, Pittsburgh. Mr. Chilman, for the past three years, has been studying at the American Academy in Rome, as the holder of the Roman Prize Fellowship. His work at Carnegie Tech will begin next September. He is a graduate of University of Pennsylvania in the class of 1914, with the degree of Master of Arts.
Architect Busy.

Plans are being completed by Architect Arthur G. Bugbee of San Francisco for a four-story and mezzanine store and office building to be erected on the southeast corner of 22nd and Valencia streets, San Francisco, at a cost of $85,000. The entire ground floor has been leased to an Eastern rug concern. The offices have been arranged for physicians and dentists. Mr. Bugbee has also prepared plans for a large residence for Mr. Taylor, of Taylor & Taylor; alterations to the residence of A. Samuel on Commonwealth avenue and a one-story industrial building on Natoma street for the Bothin Real Estate Company.

Berkeley Architect Busy.

Architect W. H. Ratcliffe, Jr., First National Bank building, Berkeley, has completed plans and awarded a contract for a three-story and basement frame and stucco apartment house for Mrs. A. J. Pray, to cost $35,000, to be erected on Piedmont avenue and Dwight Way; also a large residence in Claremont for Mr. Sumner Clement to cost $15,000; a store building on Telegraph avenue at Channing Way to cost $85,000; and a two-story reinforced concrete private school building on Piedmont Way and Kittredge street, Berkeley, for the Armstrong School for Private Secretaries. The latter building will cost $85,000.

New Catholic College.

Plans are being prepared by Architect Leo J. Devlin, Pacific building, San Francisco, for a large fireproof college building and dormitory to be erected near Mountain View, Santa Clara county, for the College of St. Joseph of Cupertino. The building will contain over 50,000 square feet of floor space and will have 400 rooms. The cost of the improvement is estimated at $1,250,000.

Granted Certificates.

The State Board of Architecture has granted certificates for the practice of architecture to Viggo A. Hansen, with Stanton, Reed & Hibbard, 622 Metropolitan building, and to Harry McAfee of Swasey & McAfee, architects, 1018 Hibernian building, Los Angeles.

State Board Elects Officers.

At the meeting of the California State Board of Architecture held in Los Angeles May 11th and 12th the following officers were elected: Clarence R. Ward, president; W. J. Dodd, vice-president; A. M. Edelman, secretary and treasurer; Sylvain Schnaittacher, assistant secretary and treasurer.

Los Angeles Synagogue.

Architects A. M. Edelman and S. Tilden Norton of Los Angeles have been commissioned to prepare plans for a $500,000 synagogue to be erected on the northeast corner of Wilshire street and Hobart boulevard, Los Angeles, for the Congregation B'nai Brith.

Opens Fresno Office.

Architect E. W. Peterson has opened an office for the practice of the profession in the Cory building, Fresno. Mr. Peterson reports that he is quite busy preparing plans for several school buildings and churches in Fresno county.

Will Design Stockton Auditorium.

The architects who have been selected to prepare plans for the new municipal auditorium at Stockton have organized and will carry on the work under the name of the City Architectural Commission, with Messrs. Glenn Allen, president W. J. Wright, vice-president, and Louis S. Stone, chairman of the executive.

Designing Hydro-Electric Plant.

Engineers Ellery, Frost & Patten, Merchants National Bank building, San Francisco, are preparing plans for a 200,000 horse power hydro-electric plant at Auburn for the American River Water & Power Company. Plans call for a dam 120 feet high, a power plant, 12 miles of log flume and considerable irrigation pipe work.

Attend National Convention.


Oakland Skyscraper.

The Tribune Publishing Company has announced that it will erect the tallest business building in Oakland. While the structure will cover a small ground area, it will be at least eighteen stories in height or two stories taller than the new building under construction for the Oakland Bank of Savings. Mr. Edward T. Foulkes, Crocker building, San Francisco, is the architect.
Architects Visit San Diego.

Members of Southern California Chapter, A. I. A., held their May meeting in San Diego, and after lunch the visitors enjoyed a trip to Tijuana. The evening meeting, held at Hotel San Diego, concluded the program. Addresses were made by Messrs. Edwin Bergstrom, Sumner P. Hunt, Wm. Templeton Johnson, Wm. H. Wheeler and Eugene M. Hoffman. The members and guests present were: Messrs. Edwin Bergstrom, Wm. M. Clarke, R. Germain Hubby, Sumner P. Hunt, Chas. F. Plummer, Alfred W. Rea, J. T. Zeller, Walter S. Davis, W. Asa Hudson, Scott Quintin, Donald R. Wilkinson, Lloyd Rally, L. J. Zeller, Sylvain Schnattacher, Wm. Templeton Johnson, Wm. H. Wheeler and Eugene M. Hoffman.

Carnegie Professor Honored.

Professor Harry Sternfeld, acting head of the Department of Architecture, Carnegie Institute of Technology, Pittsburgh, recently received a medal and diploma awarded by the Pan-America Congress of Architects that met in Montevideo, Uruguay. The award was made in recognition of work done by Mr. Sternfeld in the field of Architecture.

San Luis Obispo Hotel.

New work in the office of Architect C. A. Meusdorffer, Humboldt Bank building, San Francisco, includes a five-story reinforced concrete store and hotel building for Mr. J. L. Anderson of San Luis Obispo, to cost $200,000, and a ten-story class A apartment house at Greenwich and Hyde streets, San Francisco, for Mr. O. B. Martin, to cost $200,000.

Fresno Apartment House.

Messrs. Lewis & Ellery, Merchants National Bank building, are completing plans for a $75,000 brick veneer apartment house to be erected in Fresno for Mr. W. J. Whitney. The same architects are making plans for a Christian Science church in Hayward to cost $15,000.

Sacramento Bank Building.

The K. E. Parker Company of San Francisco submitted the low bid for the construction of a branch bank building at 6th and K streets, Sacramento, for the Bank of Italy. The building with mechanical equipment and fixtures will represent an outlay of $250,000.

$200,000 Church.

Plans have been completed and a contract has been let for a four-story steel frame church building at Tenth and Figueroa streets, Los Angeles, for the Emanuel Presbyterian Church. Mr. C. F. Skilling is the architect.

Where to Find Out About Zoning.

The Department of Commerce, in response to the needs of over 60 cities in which zoning is in effect, and of over 110 cities which have zoning ordinances in preparation, has just issued A Selected Bibliography of Zoning. This contains critical references to the most important articles on the subject which have appeared in periodicals and books. Special sections are devoted to the arguments for and against zoning, to the legal aspects of zoning, and to such technical matters as the relation of city planning to zoning, the different types of districts, and agencies and administration for zoning.

The bibliography may be obtained by application to the Division of Building and Housing, Department of Commerce, Washington, D. C.

Wireless Equipment for Office Building.

The establishment of the most modern and powerful broadcasting and receiving station that can be obtained on top of its building now under construction at Market and Main streets, San Francisco, and the wiring of all offices in the fifteen-story structure for radiophone installation, was recently announced by the Matson Navigation Company.

There will be several hundred offices in the Matson building and those of the tenants who install radio reception sets will have only to plug in at a connection that will be in each room to "listen in" to the concerts being broadcasted every day by stations throughout Northern California.

The Matson is said to be the first skyscraper on the Pacific Coast to make provision for wireless telephone conveniences for its tenants.

Addition to Mercantile Building.

Architect A. A. Cantin of San Francisco has completed plans for a $60,000 three-story addition to a large mercantile building on Sacramento street, covering ground area 25x120. Mr. Cantin has also prepared plans for a Spanish bungalow to be built on his ranch near Mountain View, Santa Clara county.

Salvation Army Building.

Architect Arthur S. Heineman, San Fernando building, Los Angeles, has completed plans for a seven-story class A hotel of 135 rooms for the Southern California division of the Salvation Army. The building will cost $175,000.

College Library Building

Architect Myron Hunt of Los Angeles is preparing plans for a library building for Occidental College to cost $100,000.
Form Partnership.
A partnership for the practice of architecture has been formed by Mr. John H. Powers and Mr. John H. Ahrend, former head draftsman for Messrs. Bakewell and Brown and Mr. Henry H. Meyers, with offices at 460 Montgomery street, San Francisco. Some of the work which they have under way includes a $50,000 apartment house on Leavenworth street, near Eddy, for Mr. C. F. Ernst, a reinforced concrete machine shop on Folsom street for Mr. E. T. Meakin, a commercial garage in San Jose and a large store building in Palo Alto.

$35,000 Apartment House.
Architect E. Geoffrey Banks, First National Bank Building, San Francisco, has prepared plans for an attractive frame and brick veneer apartment house having eight apartments of four and five rooms each, for Mr. R. C. Ogden. It will be erected on 29th street, just off of Webster, in Oakland, at an estimated cost of $35,000.

Commercial Garage.
Architect H. C. Baumann of San Francisco has completed plans for a large reinforced concrete commercial garage for Mr. Frank Clark. The building will be erected on the southwest corner of Divisadero and Grove streets, San Francisco, and will cost $35,000.

Office and Loft Building.

Community Apartment House.
Plans are being completed by Architect H. P. Merritt and Engineer C. H. Snyder of San Francisco, for an eight-story class A community apartment house at Sacramento and Mason streets, San Francisco, to cost $1,000,000 or more. Construction will be in charge of Marcus Marcussen.

Los Angeles Building.
Architects G. A. Lansburgh and S. Heiman, associated, are preparing plans for a four-story and basement class C store and office building for Messrs. E. Tropp and W. C. Crittenden. Building will be located on Hill street, north of Eighth, Los Angeles, and will cost $350,000.

State Printing Building.
Plans have been completed by the Architectural Department in the State Engineer's Office, Sacramento, for the new State Printing Office building to be erected at 11th and O streets, Sacramento, at a cost of $240,000.

Words of Praise.
The following letters speak for themselves, being two of many similar communications which the publishers have received of late and indicating the regard with which this magazine is held by contractors as well as architects:

Plans and Estimates
K. C. HINKLE
CONTRACTOR AND BUILDER
ESPARTO, CALIFORNIA
May 16, 1922
The Architect and Engineer,
625-6-7 Foxcroft Bldg.,
San Francisco.

Dear Sirs: Enclosed find check for $25.00, for which please send me The Architect and Engineer for one year. I am also enclosing a letter from a friend which refers to your magazine. Thought it might prove interesting to you to know how at least one builder regards your work.

Yours truly,
K. C. HINKLE.

D. FENTON
CONTRACTOR AND BUILDER
173 West Court Street,
Phone 180-W.
Woodland, Calif.
April 27, 1922.

Mr. K. C. Hinkle,
Esparto, Cal.

Friend Hink: Have been thinking I could come up and spend a day with you, but it seems most impossible, as you know there is always something turning up to prevent. However, whenever I have anything which I think good I like to share it with my friends. I had occasion to call on one of the leading architects of Sacramento sometime back and while there I noticed a book which he had just been reading. It is called The Architect and Engineer, so I quietly took the address and subscribed for it. Well, Hink, I think it is the greatest book I have ever gotten hold of for our business. Just what we want to keep us brushed up to the times, so I am asking you to be sure and subscribe for it. If you do, start with the April number. I started with the January number. I am sure you will like it as it will be a wonderful help to you, as you can find in it anything you can possibly need in the building line and at the same time tell you just where to get it. It also gives prices of various things and kind of all classes of labor. The beauty of it—it is published in 'Frisco. It also contains much reading in regard to construction—a reliever written by the leading engineers and architects of the coast.

Yours truly,

D. FENTON.

Address: The Architect and Engineer, 625 Foxcroft Bldg., San Francisco.

$2.50 per year.
If you haven't it for the Lord's sake get it.
P. S.—Business is good, will be better when you let loose of those lathers. Ha!

Heat Buildings—Cool Buildings Next
A San Francisco man, Mr. Willard W. Brown, well-known manager of the Heath River Irrigation Company, has filed patents on an invention which promises to command world-wide attention. Mr. Brown proposes to utilize the steam heating pipes in hot weather to distribute process-cooled air. It is claimed that by its use a temperature of seventy degrees can be maintained in buildings in the hottest tropical regions or the Orient. The invention has been installed in the United States Senate Chamber at Washington with very satisfactory results, it is said.
With the Engineers

Let Public Know What an Engineer Is

WRITING to “Engineering and Contracting” on the subject of “Greater Publicity for the Engineer,” Mr. E. T. Delery of New Orleans offers the following suggestions:

“It appears to me that a good plan would be to have civic bodies who are interested in improving conditions, have one of their members write a well-thought-out and carefully prepared paper on the matters in which they are interested, take the matter up with the officers of the local engineering society and read it at one of their meetings.

“What our engineering societies have been doing, in some measure, and what I think they should concentrate on, is to educate the public as to just what an engineer is. Most people think that an engineer can do no other thing than design structures, machinery and other devices, or make maps and surveys. What they do not seem to understand is that the chief function of an engineer is to conceive, finance, organize, design, erect and, last but not least, economically operate public works.

“In many places we find waterworks, sewerage and drainage systems being operated under the charge of men not conversant with the essential principles of engineering. There are many cities in which the health board is made up entirely of doctors and civilians. Now it is very well for medical men to find out what is desirable for the health of a community, but it is absolutely up to an engineer to decide how the remedy is to be applied, with the funds available, and to decide what funds are needed. In many cases the advice of an engineer in financial matters would be of decided advantage to public boards because of his natural tendency toward the conservative side of all financial transactions.

“It would be well for communities if the administrative head of all departments doing construction or maintenance work was a thoroughly qualified engineer of acknowledged standing. Furthermore, he should be untrammeled by partisan politics. Unfortunately, this is not likely to be permitted.

“I believe that if it were possible for the engineering societies to organize small active units (committees) who would constantly keep before the legislature and governor of each state the necessity of appointing on all public boards at least one engineer who would be a member of the board, not an employee, then the engineer would, indeed, get into a position in which he could do most for his community and gain the recognition which he deserves.

“I believe that if it were possible to keep city engineers and engineers in charge of other public boards free from political entanglements and undue influence, all public works would be conducted on a much more economical basis than is at present usually possible. This is a matter which is up to the voters of the community. If, as usually happens, most of the business men of a community are so engrossed with their personal business that they cannot find time to register or to vote more than once in several years, then the responsibility rests with them and what happens due to the politicalization of public works, is beyond anything that the engineering societies can correct.

“When the public awakes to the necessity of placing in charge of public works only men who have been trained to handle large engineering problems, then, and only then, will they reap the harvest of benefits which economical construction and operation can produce. In the meanwhile, all that the engineering societies can do is to organize and cooperate that the benefits of engineering knowledge and training on public boards shall be persistently and forcibly brought to the attention of our governors and legislatures.”

Road Building Experiments

The California Highway Commission, jointly with the U. S. Bureau of Public Roads, also with the co-operation of the Columbia Steel Company, in the use of its property, is to continue to completion the Pittsburg highway tests started last spring by the company to investigate the strength of different types of concrete highways, with particular reference to the effect of reinforcing steel. At the conclusion of the tests already instituted, the Commission and the Federal Bureau expect to start an entirely new series of tests on the same ground which has been offered for the purpose by the steel company.

The fact that expenditures for highways in the United States last year amounted to approximately $600,000,000, an amount which places
road building among the big industries of the country, justifies a considerable expenditure for experiment to determine just how they should be built to meet the needs of the ever increasing traffic.

When driving over a finished road very few people think of the problems, many and varied, which its building gives rise to. For instance, the cost of oil, gas and repairs, for motor vehicles can be varied by simply changing the location, the curves or the grades. The type of surface also must be considered in the economic operation of vehicles. Problems also arise in connection with the materials and methods of construction and maintenance of the surface. There is also the proper selection and design of the surface which includes consideration of the subgrade.

Problems of interest to a certain locality are usually investigated by the various state highway and educational institutions throughout the country, the Bureau of Public Roads co-operating by way of furnishing part of the personnel and special instruments and equipment. At present, there are in progress eight investigations of this character ranging in size from small laboratory tests requiring but one investigator and little equipment, to experimental roads like the Pittsburg highway, requiring a corps of research engineers and expensive equipment and apparatus. These activities show that the country has gone into the road building business in earnest and should give assurance that the great mileage of roads to be built will be the best and most economical that science can develop.

Consolidated Service Bureau.

The San Francisco Engineering Council has taken up the local employment situation as it affects engineers. A committee has been appointed consisting of Messrs. W. H. Phelps, chairman, W. W. Hanscom and Walter Stalder, to investigate the subject of unemployment in the engineering profession. A thorough study has been made by the committee which recommends that a consolidated service bureau be established in San Francisco for the purpose of receiving and filling openings for the services of members of the various societies.

The report has received the approval of the members of the council and the secretaries of the representative societies have been organized into a committee to draw up a proposal for financing and operating such a bureau.

Donald M. Baker Resigns.

Mr. Donald M. Baker, hydraulic engineer for the Bureau of Water Rights, has resigned as a director of San Francisco Chapter, American Association of Engineers, on account of the recent removal of the bureau to Sacramento.

Mr. Albert N. Johns has been appointed by the chapter to fill the vacancy on the board.

Concrete Product Association.

For the purpose of standardizing the quality of concrete products made and used in Southern California a new organization has been formed under the name "The Concrete Products Association of Southern California." This association, which was organized recently at a meeting held at the headquarters of the Portland Cement Association in Los Angeles, will automatically become a local branch of the national body, with headquarters in Chicago.

"The purpose of this association," said President Watkins, "is to establish a definite and standard quality in the manufacture of all concrete products, which includes building units, architectural stone, art concrete, concrete hollow tile, concrete blocks and concrete bricks, and to give the consumer a finished product that will continue to live up to the slogan of 'concrete for permanence.' We have accepted as a standard the American Concrete Institute specifications which are now the basis of building codes in most American cities."

Road Types on Lincoln Highway.

On February 1, 1922, the mileages of the various types of road construction on the Transcontinental Route of the Lincoln Highway, New York to San Francisco, were as follows: Miles

- Concrete: 521
- Brick: 82
- Bituminous macadam: 383
- Macadam: 287
- Asphalt: 78
- Creosote block: 5
- Granite block: 5
- Graded gravel: 1,052
- Natural gravel: 21
- Graded earth: 526
- Natural earth: 136
- Sand: 3

Valuable Stock Bulletin

Users of construction equipment and machinery will be interested in the Priced Stock Bulletin just issued by the Smith-Booth-Usher Company of Los Angeles and San Francisco.

In line with the policy of that company, the price of each stock item, and this means something over 1000 machines, exclusive of supplies, is shown together with the stock location (Los Angeles or San Francisco). The completeness of the Smith-Booth-Usher Company's stock as shown in this Priced Stock Bulletin is very impressive and as a "Buyer's Guide" the Bulletin should prove invaluable.
The Contractor

When a Contractor Buys Lumber.

WHEN a contractor buys lumber he wants what he buys. When a car is billed 3,000 feet short and the grade is below the contractor suffers. Such suffering has not been uncommon. Accordingly, a conference to the point taken part in by Secretary Hoover at the National Lumber Manufacturers' Association convention April 6 is of interest.

In the early part of the discussion, Mr. Hoover was told by Mr. Hines of the Edward Hines Lumber Company, Chicago, that the Chicago Lumber Dealers' Association have subscribed to the following principles:

"They will have their inspectors to inspect lumber in any part of the city; they will see that the lumber is according to grade; they will see that the contractors, the architects, and the public if any questions come up, have an inspection right in Chicago."

Mr. Hines said, "That will protect the public and will also protect the retailer from the ones who are pursuing bad practices. Of course, you can appreciate that in competition, the man who is honest cannot compete with a dishonest man. Some cars of lumber arriving in Chicago were billed short 3,000 feet on every car. The grade was always below."

Mr. Hines then read resolutions passed by the Southern Pine Association at their recent convention in New Orleans, which are as follows:

1. The committee recommends the grade marking of lumber as a means of protecting lumber buyers.

2. The committee recommends that lumber be marked with the name of the grade, or such abbreviation thereof as it may be practicable to use.

3. The committee recommends that the number of the mill, to be designated by the Southern Pine Association, be shown on the lumber in connection with the grade mark.

4. The committee recommends that the board of directors authorize the secretary-manager to solicit suggestions for mechanical or other means of stamping, printing or impressing grade marks upon manufactured lumber.

5. The committee recommends that the board of directors be requested to obtain the opinion of counsel to ascertain whether or not the Southern Pine Association can legally recommend the adoption by its subscribers of symbols or grade marks, to be used by them in connection with marks designating the number of the mill and the grade.

6. The committee recommends that the directors instruct the secretary-manager to address an inquiry to the association subscribers asking whether or not they will be willing to adopt the practice of grade marking.

7. The committee recommends that when 50 per cent of subscribers shall have indicated their willingness to join in the movement of grade marking lumber for the protection of the buyer, that the directors authorize the issuance of a list of such mills in alphabetical order, showing the number assigned to each mill and to furnish such list to all buyers of lumber.

8. That subscribers be urged to place in each car of lumber loaded by them a grade marking showing tally a piece and grade of the material loaded therein.

9. That buyers, when desiring to ascertain the mill by which a certain shipment of grade marked lumber has been made may apply to the association for the same.

Mr. Hines: If such resolutions are complied with a very large means of protection to the buyer can be obtained, because there will be shown on every car a piece tally of the contents of the car. The public will be advised, all over the United States, when a carload of lumber is shipped, the mill shipping that lumber will have in the car, in a conspicuous place, the contents of the car, both in grade and feet, and that will really afford the buyer protection to a large extent. In addition to that, in my opinion, the retailers of the United States would welcome co-operation with the manufacturers so far as protecting the real ultimate consumer of lumber. I think we can secure the active and immediate co-operate of the Retail Lumber Associations of the United States. If that is done, the ultimate consumer will be, for the first time, actually protected in the buying of his material, whether he buys 500 feet or 5,000,000 feet.

The Chairman: While you are on your feet, Mr. Hines, I would be glad to have you give the secretary your views on the appointment of inspectors by the National Association.

Mr. Hines: That is the most practical way of protecting the public. First, the National Association would be held responsible for the honesty of the inspector, and second, for his being a practical man and the issuance of a certificate backed by the National Association certificate of the contents of a certain car, that it contains so much lumber and that it contains the particular grade for the purpose desired. Is that the point?

The Chairman: Yes, that is the point.

Secretary Hoover: Is it feasible to stamp the board contents on each stick?

Mr. Hines: No, that is not feasible. The important thing is to have the grade shown. That is very practical. We are doing that now in export lumber. The grade is marked. If it can be done for export it can be done for domestic use. That is not so much to protect our industry as to protect the public.
STANLEY
Ball Bearing Butts

Seven Distinctive Features

1. Non-rising Loose Pins.
2. Self-lubricating Pins
3. Beveled Edges
4. Square Shoulders
5. Stanley Ball Bearing Washers
6. Non-detachable Washers
7. Square Corners

The Stanley Works was the original designers and manufacturers of Ball Bearing Butts. In addition to the Seven Distinctive Features the class number is stamped upon the back of each Butt for identification. The letter "Z" stamped on the back of the Butts distinguishes the Stanley Sherardized Finish—an antirust finish recommended for all steel Butts exposed to the weather. When specifying remember The Seven Distinctive Features of Stanley Ball Bearing Butts.

THE STANLEY WORKS
NEW BRITAIN, CONN.

New York  Chicago  San Francisco  Los Angeles  Seattle

Manufacturers of
Wrought Hardware and Carpenters' Tools

When writing to Advertisers please mention this magazine.
Secretary Hoover: Would you propose to have the national inspector subject to the call of the consumer?

Mr. Hines: Absolutely. For instance, each regional association would have their particular inspector for their species of wood. If any question came up anywhere the public would have a right to call for an inspector, whether for yellow pine or anything else. The public would be shown that the National Association is back of the inspection, and you can appreciate that it would be difficult to get an inspector who could grade eight of ten different kinds of lumber, but on the coast they could have an inspector of hemlock, fir and so forth.

Secretary Hoover: Suppose there were a dispute which the inspector decided in favor of the shipper, what recourse would the consumer have?

Mr. Hines: In our experience we have never known a case where the licensed inspector graded lumber but where the public was satisfied, and I presume we have had over 1,000 cases in different kinds of woods. In the first place, the inspector is practical; second, our rules for grading lumber are so plain that if a man is reasonably acquainted with the grades, he knows the licensed inspector is doing full justice. We have found that the National inspectors have leaned a little backward against the mills. I am speaking both as a buyer and a seller. We have a number of yards in Chicago, and we buy forty or fifty cars a day. We have had differences with other mills, but we have the first case to find that the inspector has not done us full justice. That statement will be endorsed by all of the lumber yard leaders of the city of Chicago, and I am positive it will be endorsed by the entire retail trade of the States.

Secretary Hoover: Do you think it necessary to introduce some idea into the lumber contract that makes such a contract, in case of a dispute, subject to inspection?

Mr. Hines: That would be an excellent idea. I would welcome that, both as a manufacturer and a buyer.

The Chairman: We have not resorted to that, Mr. Secretary, because we are only one party to the contract. As I understand, where there is an official inspection, both parties to the controversy join in submitting the matter to arbitration, so that the decision of the arbitrator is final and binding on both parties.

Secretary Hoover: How far do you think that this idea can be adopted?

The Chairman: My own thought is that it can be made universal.

Secretary Hoover: And it would apply to mills which are not members of the Association, as well as to those that are, if the outside mills don't want to take membership?

Mr. Hines: My idea is this: The mills outside of the Association would very quickly appreciate the protection they have, which is in the form of an insurance policy that would be written by the Association, and they would come into the Association, and when in the Association they would be obliged to subscribe to certain honest principles which we stand for. So I think we would be doing both the manufacturer and the public a real good and our business would be better understood by the public.

To Simplify Building Material.

Simplification of building materials as a means of eliminating waste in industry was discussed at a recent conference held between officials of the U. S. Department of Commerce and representatives of architectural, engineering and building organizations.

The work of the meeting may be summed up in the following resolution which was adopted:

"Whereas, the undersigned committee of architects, contractors and engineers are fully in accord with Secretary Hoover's program for elimination of waste as a major means to the stimulation of American business, and

"Whereas, prominent among the many factors which contribute to such waste in building as evidenced by the high cost of construction are the multiplicity of types and the great variety of dimensions which now abound in many of the component parts which enter construction; and,

"Whereas, the cost of construction will undoubtedly be thereby lessened, the industry stimulated, and interest of the public conserved by dimensional simplification; be it

"Resolved, that this committee be empowered to discuss the subject of dimensional simplification and recommends to the Department of Commerce and the Division of Simplified Practice to study certain essential parts of construction with a view to simplifying the types and lessening the number of different dimensions of those parts."

In selecting the items of building materials to be given attention first, the following were designated: millwork, plumbing, heating, interior wall construction, hardware, lighting fixtures, clay products, the latter including brick, tile of all kinds, terra cotta, sewer pipe, etc.

In giving these items attention, the department will formulate sub-committees to bring together the manufacturers and others having to do with each particular commodity or service.

Designing San Diego Theater.

Architect B. Marcus Priteca, Pantages Theater building, Seattle, has been commissioned to prepare plans for a seven-story class A theater and office building to be erected at San Diego for Messrs. Richard T. Robinson, Jr., and Robert Blankenship.
Folding Gates

Ornamental and Miscellaneous Iron Work

Steel Sash :: Wire Work

Michel & Pfeffer

Iron Works

Harrison and Tenth Streets
San Francisco

Phones | Market 730

You don't have to worry about the inside of

Kennedy Valves

they are made to last and they do last

Send for Catalog

The Kennedy Valve Mfg. Co.

Branch Offices and Warehouses:
NEW YORK, 95 John St.
SAN FRANCISCO, 23-25 Minna Street.
BOSTON, 47 India St.
CHICAGO, 204-8 N. Jefferson Street.

Sales Offices:
Philadelphia, Continental Hotel Building.
Salt Lake City, 503 Dooley Building.
El Paso, 704 Two Republics Building.
Seattle, L. C. Smith Bldg.

When writing to Advertisers please mention this magazine.
Plumbing Industries Merge.

With the consolidation of the three pottery and porcelain plants of the Pacific Manufacturing Company and the Pacific Porcelain Ware Company of Richmond, California, and the incorporation of a new company under the name of The Pacific Sanitary Manufacturing Company, with a capitalization of $2,000,000, the Pacific Coast can claim one of the world's largest plumbing fixture industries. The new company is financed by the same people who owned the other two organizations and there will be no change in management, Mr. N. W. Stern remaining president, Mr. M. E. Wangenheim, vice-president, and Miss F. Mayblum, secretary.

The three plants had previously operated as separate units in the manufacture of a line of plumbing fixtures, which were marketed through a jointly operated selling organization. This sales organization now becomes part of the new company. Extensive additions to the three plants are already under way and plans for handling a nation-wide trade are well matured.
A 33-YEAR TEST

MADISON SQUARE GARDEN affords convincing evidence of the durability of Terra Cotta. After thirty-three years' exposure to climatic action its Terra Cotta is in perfect condition throughout.

This example, one of many in all parts of the country, attests the absolute permanence of Terra Cotta when its use is intelligently conceived and its installation properly supervised. Northern Italy and France carry the demonstration further in many instances of over 500 years' standing.

Correct detailing of terra cotta and proper related construction will insure this result.

Send for our reference work, "Terra Cotta Standard Construction," a volume of seventy plates of typical details; free on request to architects, engineers, draftsmen and students of recognized professional schools.

Address: National Terra Cotta Society, 19 West 44th Street, New York City.

TERRA COTTA
Permanent Beautiful Profitable
Pumps for Buildings

The Pelton Water Wheel Company, 19th and Harrison streets, San Francisco, which has for several years manufactured a line of centrifugal pumps both for irrigation and various types of heavy-duty service, has recently increased its activities by bringing out its type FD pump. This type is specially designed for efficient operation under the ordinary requirements for tank supply and similar service, such as the delivery of a small quantity of water against a relatively high head.

Both two-stage and four-stage designs are manufactured, the former being recommended where the total head does not exceed 125 feet, and the latter for higher heads. The casing is split vertically to permit easy access to the rotating elements. The housing and base for both the outboard and the inboard bearings are cast integral with the inside cover-plate of the pump. This type of construction not only insures permanent accurate alignment of the shaft, but also makes possible the use of an overhung pulley and consequently the easy conversion of the pump from belt to direct drive or vice versa.

Although this line of pumps has been on the market only a short time and until recently no great effort was made to push their sale, a considerable number have been placed. In the Mattei building at Fresno, a four-stage pump has been in service for a little over a year, while in the Sherman Clay building and the Newhall building in San Francisco there are two-stage pumps. The service expected of these pumps, as well as a number of others, is taking water at city pressure and “boosting” this to the required pressure. In the Mattei building water can be taken from a surge-tank as well as from the city mains. This double requirement calls for a pump of great flexibility.

Other pumps of this type, however, such as the four-stage pump of the Francis Water Co., of Ferndale, are used as a primary source of supply, and operate against a suction as well as a discharge head.

The type FD model, like the other pumps of the company’s line, is distributed both by the company itself and also by about fifty dealers at various points throughout the Pacific Coast States.

To Design Federal Bank.

Architects Whitehouse & Price of Spokane have been commissioned to prepare plans for the Federal Land Bank’s new building in that city at an estimated cost of $100,000.
A very effective means of breaking the monotony of a large wall expanse. This charming treatment is secured without the use of a single special shape or size; it shows the plasticity of the standard sized brick.

The Plasticity of Standard Sized Face Brick

The economy of using standard sized Face Brick instead of specifying special sizes and molded forms is apparent to any architect. And, except in rare instances, it is unnecessary. The three series of plates in "Architectural Details in Brickwork" offer many suggestions of artistic effects that can be secured with standard sized Face Brick. Each series is in an enclosed folder, with printed tab, ready for filing. A set of these folders—comprising more than one hundred de luxe half-tone plates—will be sent to any architect requesting them on his office stationery, and his name will be placed on the list for future mailings.

AMERICAN FACE BRICK ASSOCIATION
1758 PEOPLES LIFE BUILDING • CHICAGO, ILLINOIS

When writing to Advertisers please mention this magazine.
The "Perfection" Wall Bed

Mr. Leverett T. Spaulding announces a change in the firm name of Spaulding and Monks to Leverett T. Spaulding with offices and salesrooms at 1041 Mission street, San Francisco.

Mr. Spaulding is optimistic over the future of the wall bed market as practically all the new apartments, hotels and flats now under construction have been designed to conserve space. "Perfection" wall beds make two rooms out of one and this type of bed is becoming most popular for small residences.

The "Perfection" bed, sold by Mr. Leverett T. Spaulding, is strong, beautiful and durable. Its construction is substantial with little or no strain, whether in use or in retirement. The materials used are the best the market affords and there is nothing about the bed to wear out. For this reason the investment in a "Perfection" bed is permanent with no outlay for upkeep. The action of the bed is quiet, accurate and graceful and when in use rests on four positive legs like any ordinary bed. The "Perfection" offers a variety of installations so that in material and style it may be made to harmonize with any scheme of furnishing.

The complete line of "Perfection" wall beds can be seen at the company's salesrooms, 1041 Mission street, San Francisco.

Timber Preservation Grows.

The increased demand for permanent timber structures is shown in a recent report of the Service Bureau of the American Wood-Preservers' Association.

Over 2,400,000,000 board feet of timber for various purposes were pressure treated in 1921 by the 122 wood-preserving plants in operation throughout the United States, thereby surpassing the 1920 record by nearly 17 per cent. Approximately equal amounts were treated with coal-tar creosote and with zinc chloride, the standard wood preservatives.

Ease of handling and the permanence of well-treated wood at low cost are given as the reason for the increased demand. The proper use of a wood preservative adds a new quality to timber which enhances its value as a construction material.

The material treated consisted mainly of construction timbers for wharf, bridge, highway, mining and building purposes, piling, telephone and power poles, ties, fence posts, wood blocks for street paving and for factory floors, and timber for miscellaneous uses.

Has New Vice-President.

Harvey Hubbell, Inc., of Bridgeport, Conn., announce the recent election of Mr. Harry F. Bliven as vice-president of the company.

For more than twenty years Mr. Bliven has been general sales manager of the company, and as vice-president is to continue in charge of sales.

Although extremely reticent about himself, it is known that Mr. Bliven, like the organization with which he has had such a long and successful affiliation, is thoroughly a product of Connecticut. He was born at Windham, in the eastern part of the state, on September 27, 1871, and graduated from the Willimantic High School. His earlier experience in the electrical field comprised eight years as salesman with the Western Electric Company, terminating in 1904, when he left to join the Hubbell forces.

L. A. Norris Retires.

Mr. L. A. Norris, who has followed the building business in San Francisco for fifteen years or more as head of the L. A. Norris Company, distributors of Clinton welded fabric and wire lath and also as one of the organizers of the Clinton Contraction Company, has turned over the business to the Wickwire Spencer Steel Corporation, 111 Townsend street, San Francisco.

Residence Addition.

Plans for extensive alterations to the residence of Mr. William Sprout, president of the Southern Pacific Company, have been prepared by Architects Bliss & Faville of San Francisco.

Personal.

Mr. W. F. Staunton, Jr., has opened an office for the practice of architecture at 200 Consolidated Realty building, Los Angeles.
Actual Photograph of Wall

\textbf{AIRDRY}\newline\textit{Registered U.S. Patent Office.}

\textit{"The Electric Towel"}

\textbf{Noted Educational Institutions Install "AIRDRY"}

Harvard, Cornell, Columbia, University of Chicago, Massachusetts Institute of Technology, City of Boston School Dept. and the University of California are some of the many users who welcome the 100\% Sanitation and 60\% Economy of "The Electric Towel."

AIRDRY dries the hands Nature's way—by evaporating moisture with a soft warm breeze. No towels; no laundry expense. Its success is recognized wherever modern sanitation and sensible economy are demanded.

Specify AIRDRY—Comparative costs and savings upon request

Two Models—Pedestal and Wall

\textbf{AIRDRY CO. OF CALIFORNIA}

Pacific Coast Distributors

155 Montgomery Street, San Francisco

When writing to Advertisers please mention this magazine.
A New Steel Sash Chain.

The Smith & Egge Manufacturing Company of Bridgeport, Conn., originators of sash chain, are manufacturing an improved steel chain for sash weighing not more than 100 pounds and it promises to be as popular as other brands of chain which this company has been producing for many years. It is known as the S. and E. 00 sash chain and is made from the best cold rolled steel .035 thick and the style of the link has been fashioned so as to get the greatest tensile strength. The makers guarantee the tensile strength to be 250 pounds and recommend this chain for sashes weighing up to 100 pounds. The plain steel chain has a fine finish, and may also be had in both copper plated and sherardized finishes at a slight advance in price.

While this chain was designed for sash chain, there are many other ways in which it can be used. The style and shape of the link give the chain a very artistic appearance.


Le Brun Traveling Scholarship Competition.

The Le Brun Traveling Scholarship for 1922 has been awarded to Mr. Lionel H. Pries of Philadelphia, from a field of thirty-three competitors from all parts of the United States.

The quality of the designs submitted was unusually high and the solutions varied. The winner receives $1400 to enable him to travel abroad for the purpose of study. In addition to the prize, the jury gave mention placed first to Mr. George K. Trautwein of Philadelphia; mention placed second to Mr. John O. Vegezzi of New York City and mention placed third to Mr. Paul Hyde Harbach of Buffalo. Mentions not placed were awarded as follows: Mr. George N. Pauly, Mr. Roy F. Larson, Mr. Gerald K. Geerlings, Mr. Louis Fentor, Mr. Roy Walling Cheesman and Mr. Frederick Ross Lorenz.

This prize was founded by Mr. Michel Le Brun in 1910, and was originally awarded every other year, but recently Mr. Pierre Le Brun has increased the endowment so as to enable the New York Chapter, American Institute of Architects, trustees of the fund, to award it annually. The jury of award was composed of Mr. Pierre N. Le Brun, ex-officio; Mr. Milton B. Medary, Mr. Henry Bacon, Mr. Louis Ayres, Mr. Laurence F. Peck, Mr. Francis Nelson and Mr. Julian Clarence Levi, chairman.

The Ball Means Strength, Economy

The Reliance Ball Bearing principle permits of the most compact, rigid and simple construction. It provides the greatest strength to the exclusion of cumbersome and trouble-making parts.

The action is direct: The balls are not accessory to other rotating parts but themselves support the door and provide easy action irrespective of its weight.

RELIANCE Ball Bearing ELEVATOR Door Hangers

Reliance simplicity means quicker and cheaper installation. This saving permits the use of "Reliance" at an ultimate cost approximating that of the cheaper device.

RELIANCE-GRANT ELEVATOR EQUIPMENT CORP'N
Park Ave. and 49th St., New York
PACIFIC COAST AGENTS

Waterhouse-Wilcox Co. . . . . . San Francisco and Los Angeles, Cal.
Columbia Wire & Iron Works, Portland, Ore.
Announce that they are representing the following firms handling Building Materials and Contractors' Accessories and Architects or Contractors having occasion to use any of these lines, will be given best possible service with every assurance of dependable co-operation.

**Midwest Steel & Supply Co.** of New York and Bradford, Pa.
Midwest Steel Ankerails and Stringers for Power-Transmission problems: Bulldog Timber Joint Plates: Midwest Air Filters.

**Symons Clamp & Manufacturing Co.** of Chicago, Illinois.
Concrete Column-form clamps and accessories.

**Universal Form Clamp Co.** of Chicago, Illinois.
Concrete Building Accessories.

**Fiat Metal Manufacturing Co.** of Chicago, Illinois.
Metal Toilet Partitions and Shower Stalls.

**The Bishopric Manufacturing Co.** of Cincinnati, Ohio.
Nationally Advertised Bishopric Stucco and Stucco Base.

**Best Bros. Keene's Cement Co.** of Medicine Lodge, Kansas.
Keene's Cement, Standard of America.

**The Nitrose Company** of Peoria, Illinois.
Nitrose Metal-Preservative Paint.

It is our aim to represent articles of the highest class only, to give best possible service, to be punctilious in quotations and in fact, to stand absolutely behind every statement, offer, or guarantee we make.

Under the head of SERVICE it is our desire to place at the disposal of clients, information or research regarding any products or materials they require, all without obligation to them.

We invite your call at our office to meet our personnel and to view our samples and literature; and we trust that mutual interest may bring us frequently together.

**JOHN R. STEFFENS-LOMAX CO.**

**BUILDING MATERIALS AND CONTRACTORS' ACCESSORIES**

Telephone Sutter 2297
951-953 Monadnock Building
San Francisco, Cal.
SECO D. F. PUSH
BUTTON PANEL BOARDS AND SWITCHES

A high class installation for theaters and public buildings that means efficiency in electrical control.

Photograph shows switchboard with door and trim removed

Also Manufacturers of

Safety Panels, Safety Controls, Cut Outs, Cabinets, Knife Switches, Switch Parts, Electric Appliances and Specialties

Safety Electric Company
Samuel H. Taylor, Proprietor

59 Columbia Square
San Francisco

“Snowballing” by the Unions.

“‘Snowballing’ seems again to be in season in New York City,” says the American Contractor. Bricklayers and plasterers have quit work on jobs for the purpose of getting their wages raised. And they have succeeded in getting them raised. Outside of the fact that such tactics prove there must be considerable building going on, the news is disheartening and disgusting. Men should stick to their contracts. We shall witness more snowballing before the season is over unless activities of the rail unions and the coal miners put a premature end to activity. **

In the construction industry, we can learn many a lesson from the coal mines and from the railroads. We can learn from the mines to avoid seasonal activity as much as possible. We must learn to circumvent conditions which make for a big excess of men one month and a scarcity the next month. Right now we are crossing the line from too many to not enough and there will be snowballing. Where, oh, where are the apprentices who will make the adequate supply of men for tomorrow. Unless we get them, there is going to be a regular snow slide some time which will make present snowballing look like kid play. **

Improved effective equipment will be the advantage of the contractor even more so than now, the minute there is a shortage of good skilled workmen. It is a part of the “team” which will drive through the job to a successful conclusion as far as the ledger is concerned. While railroads are not jammed with freight, while equipment manufacturers are not behind hand on orders is the strategic moment to slip in the order for equipment which will fit into the organization. There is never a time to buy equipment which does not fit. There is one advantage the contractor has in buying which too often is not appreciated. That advantage is the willingness of the average manufacturer to discuss frankly and at his own expense, how his particular equipment does fit in. This is a real service and should be considered. Just think back twenty or thirty years how service on the part of the manufacturers as well as the effectiveness of the equipment offered differed from now.

Wall Board Plant

Mr. William B. Thurman, president of the California Cedar Products Company, announces that his firm has just established a new wallboard plant south of Stockton. The new enterprise entails a capital of $50,000.

When writing to Advertisers please mention this magazine.
Here's What a Bank Architect Thinks of Radiantlight:

We specify Radiantlight fixtures for Bank Interiors because we find they give satisfactory results at moderate cost, combined with high artistic value.—H. H. Winner

Besides the Merchants National Bank, Sacramento, the H. H. Winner Company has used Radiantlight fixtures in the several branch banks of the Anglo California Trust Company, San Francisco, and the new Modesto Savings Bank, Modesto, California.

Electric Appliance Co.
807 Mission Street
San Francisco
What Does It Mean to You
—when a manufacturer trade marks his product?

It means this—
He is maintaining QUALITY standards—standing squarely behind his products—protecting you and himself from inferior merchandise.

When specifying hardwood, say
"BATAAN" MAHOGANY

Lumber, Veneers, Plywood Panel
Hardwood Flooring

CADWALLADER-GIBSON COMPANY
234 Steuart Street
San Francisco, Calif.

MEESCO WAGON LOADER
For Handling Sand, Gravel, and all Kinds of Bulk Material from Ground Storage to Trucks or Wagons.

Meese & Gottfried Company
San Francisco Seattle Portland Los Angeles

SERVICE
TESTING
INSPECTION
CONSULTATION
PRODUCTION

Structural and Engineering Materials

ROBERT W. HUNT & CO.
ENGINEERS
Chemical and Physical Testing Laboratories

New York Chicago Pittsburgh
St. Louis San Francisco Mexico City
London Montreal

When writing to Advertisers please mention this magazine.
A Clause That Cuts The Loss of Millions

There are millions of dollars wasted every year in this country through plate glass breakage due to faulty setting. This condition has no right to exist. This great waste of money, this burden borne by merchant and insurance companies alike—and indirectly by everyone—can be prevented, by making the following clause a part of all store front specifications:

GLAZING SPECIFICATION
All Metal Sash, Corner Bars, Division Bars and Self-Adjusting Setting Blocks Used in Store Fronts Must Be Listed by the Underwriters’ Laboratories.

A is the point where the outer member presses against the glass when the delicate watch-like turning of the key at C brings the glass automatically into contact with the rabbet of gutter B sliding on the anti-friction Murnane Self-Adjusting Setting Block.

Here is the logical answer to the plate glass breakage evil. Give it your hearty support. It will materially reduce the total wastage.

All Zouri Key-Set Sash, Corner Division Bars and Self-Adjusting Setting Blocks have been listed by the Underwriters’ Laboratories.

Ask either of the firms listed below for full particulars of Zouri Construction

COBBLEDICK-KIBBE GLASS COMPANY
Oakland and San Francisco

CALIFORNIA PAINT & GLASS CO.
Los Angeles, California

Architects are invited to visit our exhibit at 77 O’Farrell Street, San Francisco

Zouri Drawn Metals Company

Factory and General Office:
1626 EAST END AVENUE CHICAGO HEIGHTS, ILLINOIS

When writing to Advertisers please mention this magazine.
THE AMERICAN ART ANNUAL,
a book of 686 pages with seventeen full-page
illustrations, issued by the American Federation
of Arts, Metropolitan Museum of Art.
New York.

This is the only publication of its
kind and takes rank among the lead-
ing directories of American art ac-
tivity. It contains information concern-
ing all phases of art in the United
States; the opening article, “The Year
in Art” gives a summary of the lead-
ing events in this field during the en-
tire year.

With this issue the American Art
Annual rounds out its eighteenth year,
marked by an outstanding feature in
the additional section, “Who’s Who in
Art,” a biographical directory of over
5,000 living American painters, sculpt-
ors and illustrators, writers, lectur-
ers, a list which is unique and should
be of great service to those personally
interested or financially concerned
with art matters.

There are given reports of art mu-
seums and art societies, and a list of
over 250 art schools, giving curricula,
etc. Also, there is a necrology of the
art world for the year.

Of particular interest to collectors,
museums and dealers is the section
devoted to auction sales of paintings,
drawings, prints and sculpture which
contains a complete listing of items
in these fields of art, with details as
to artists, owners, purchasers, sizes
and prices brought.

Plumbing and Heating.

Many of the beautiful new school
houses erected in Sacramento the last
year or two and which are illustrated
in this issue of The Architect and En-
gineer, have plumbing and heating
installations of the most approved
types. In the high school building,
which is to be illustrated in a future
issue, all the plumbing and heating
equipment is by Hatley & Hatley,
whose main office is in the Miteau
building, Sacramento. The same firm
installed the plumbing and heating in
the Newton Booth and Bret Harte
schools, the plumbing in the former
Franklin school and the heating in the
McKinley grammar school.

In New Offices
Architect Aleck E. Curlett, Claud
Bedman, associate, have moved their
offices from the Merchants National
Bank building, to 408 Union Bank
building, Los Angeles, Mr. Curlett de-
signed the Union Bank building, and
has arranged a suite of five offices to
suit his needs. He has plans on the
boards at the present time for nine
Class “A” buildings.

When writing to Advertisers please mention this magazine.
A faucet that will deliver hot, mixed or cold water :: ::

Installed in the kitchen sink, this popular Quaker fixture supplants the customary two separate faucets, and provides a convenient place for soap.

*It lightens work and saves time*

**Haines, Jones & Cadbury Co.**
Makers of plumbing supplies
857-859 Folsom Street, San Francisco
Philadelphia, New York, Richmond, Va., Savannah
Jacksonville, Charlotte

When writing to Advertisers please mention this magazine.
SPECIFY
SCHROEDER
DIRECT - FLUSH
VALVES
For Toilets

"THE SCHROEDER'S CORRECT—ITS FLUSH IS DIRECT"
STANDARD METALS MANUFACTURING CO.
Main Office and Factory
San Francisco Office
1300-1302 No. Main St., Los Angeles
16 Stuart St., Douglas 1134
Sales Representatives: San Diego, Portland, Seattle, Salt Lake City, Denver, Phoenix

SUPREME VARNISH
AND ENAMEL
SALES COMPANY
Sharon Building 55 New Montgomery St. San Francisco, Cal.

Ask Your Dealer for

ARDEN PLASTER
Manufactured by
UNITED STATES GYPSUM COMPANY
The World's Largest Producers of Gypsum Products

Plumbing Heating Ventilating
LUPPEN, HAWLEY & THING
CONTRACTING ENGINEERS
A few of our Properly Installed Systems:
Jefferson School, Sacramento Fresno High School
East Sacramento School Pacific Grove Grammar School
Franklin School, Sacramento Atascadero High School
Chamber of Commerce, Sacramento Willows Grammar School
Bee Building, Sacramento Maxwell Grammar School
Liberty Theatre, Sacramento Parlier, Porterville, Courtland
906 Seventh Street SACRAMENTO

When writing to Advertisers please mention this magazine.
DIFFUSELITE BLINDS

CONTROL LIGHT AND AIR

Give proper ventilation, improving health. Eliminates glare, relieving eye strain. Make shades and awnings unnecessary. Save time and money. Stimulate better work.

The Diffuselite System includes Diffuselite Paints and Fixtures used in connection with Diffuselite Blinds.

Details in Sweet’s Catalogues. Write for Booklets

THE J. G. WILSON CORPORATION

General Offices, 11 East 36th St., New York
621 N. Broadway, Los Angeles
ROBERTSON PROCESS SKYLIGHTS
Made by an exclusive patented process which includes Robertson Process puttyless joints, condensation gutters and metal parts as well as a bar beam based on approved engineering principles, strong enough to avoid deflection.
Catalogues and full information on request.

H. H. Robertson Co.
1007 Hobart Building
SAN FRANCISCO, CALIF.
Telephone Garfield 522

MAKE TWO ROOMS OUT OF ONE
Use Wall Beds in the residence or apartment house you are designing. Be sure to specify “PERFECTION.” It is in a class by itself.
In its flexibility and adaptability, minimum space required, simplicity of installation, ease of operation, grace of outline, and variety of installation, the “PERFECTION” Wall Bed fully justifies its name.

LEVERETT T. SPAULDING
1041 Mission Street
San Francisco, Cal.
PHONE MARKET 8405

NO FLUE OR VENT
Gas Heating Appliances
GUARANTEED FREE FROM ODOR AND MOISTURE
Pure Air Gas Heating Co.
401 BATTERY STREET
PHONE DOUGLAS 2983
SAN FRANCISCO, CAL.

ARCHITECTS • BUILDERS • CONTRACTORS
MODERN CONDITIONS practically DEMAND gas heating. Be fore-handed and include provision for the use of GAS HEATING APPLIANCES in your plans and construction program. If an estimate on a complete heating system will help, do not hesitate to call on us.

Pacific Gas and Electric Company
There's a Recognized Need for Better Lighting

Those concerned with the designing and building of business structures are confronted with the problem of lighting every day.

It is generally conceded that daylight provides the most efficient working light, and for this reason Western Venetian Blinds are now specified window equipment. They make it possible to utilize all available window area; they control and regulate daylight; they eliminate sun glare; they serve in the place of awnings and shades.

_A copy of illustrated catalog will be sent on request_

**Western Blind & Screen Co.**

*Factory and General Offices*  
*Los Angeles, Cal.*

_San Francisco, Cal.—921 Hearst Bldg. Portland, Ore.—205 Henry Bldg.*

*When writing to Advertisers please mention this magazine.*

CALIFORNIA GRANITE COMPANY
STONE CONTRACTORS
Phone Sutter 2646
Builders' Exchange, San Francisco
Main Office: Rocklin, Placer Co., Cal.
Quarries, Rocklin and Porterville
Telephone Main 82

RALPH E. DODGE
CIVIL ENGINEER.
Bridges and Special Structures of Reinforced Concrete and Steel Structural Designs for Buildings Reports on Highway Projects.
Supervision of Construction.
Telephone Kearny 1783 San Francisco, Calif. 251 Kearny Street

CHAS. STOCKHOLM & SONS
GENERAL CONTRACTORS
849 MONADNOCK BUILDING Phone DOUGLAS 4657 SAN FRANCISCO

Hot Water Electrically
ALL YOU WANT THERM-ELECT WATER HEATER for APARTMENT HOUSES
ALL THE TIME RESIDENCES, ETC.
ELECTRIC SALES SERVICE COMPANY
2532 Sixth Street, BERKELEY Phone Berkeley 3070

JOHN M. BARTLETT
GENERAL CONTRACTOR
Office Phone Lakeside 6750
357 - 12th ST. OAKLAND Res. Phone Berkeley 6884W

LARSEN-SIEGRIST CO., Inc.
BUILDING CONSTRUCTION
807 Claus Spreckels Building SAN FRANCISCO

LAWTON & VEZEWY
CONTRACTORS AND BUILDERS
EVERSON BUILDING OAKLAND, CALIFORNIA

L. J. RUEGG J. B. RUEGG
RUEGG BROS.
CONTRACTORS AND BUILDERS
Phone Douglas 1599 California Commercial Union Bldg., San Francisco

When writing to Advertisers please mention this magazine.
Wherever the metal will be exposed to air and moisture, an iron free from rust-promoting impurities should be used.

All window-frames and sash should be made of rust-resisting iron, all skylights, cornices, guttering, down-spouting, water-tanks, heating and ventilating ducts, metal lath, and metal partitions.

These are apt to suffer from premature corrosion if made of iron or steel containing the usual amount of impurities, and most of the iron and steel manufactured in commercial quantities does contain them to a harmful extent.

The impurities form spots which promote rust. The only way to prevent the formation of spots is to reduce the quantity of impurities to a small percentage.

"Armco" Ingot Iron resists rust because it contains less than one-fifth of one per cent of such impurities, not enough to form the objectionable spots. Service and laboratory tests prove that it outlasts steel of the same gauge and finish.

The American Rolling Mill Company, Middletown, Ohio
Bath Room Fixtures of Quality

A BATH ROOM should be just as true an expression of the owner's taste and individuality as any other room of the house.

No more is it considered a luxury, but an absolute necessity to your health and comfort.

Our fixtures reflect the finest ideas in design and construction as related to sanitation, utility and service.

To give this subject the attention it demands, you should visit our display rooms at 64 Sutter Street, San Francisco.

Holbrook, Merrill & Stetson

Dealers in
Plumbers' Supplies, Iron Pipe and Fittings, Metals, Steam, Water and Hot Air Heating Apparatus, Stoves, Ranges, Kitchen Utensils.

Show Room, 64 SUTTER STREET
Main Office and Warehouse
Sixth, Townsend and Bluxome Streets, San Francisco

Look for this Trademark And if it's there don't worry any more about your Valves and Fittings

Specify and insist upon having

The Kelly & Jones Co.
Valves and Fittings
Byers Genuine
Wrought Iron Pipe
Republic Steel Pipe

Complete Line of Plumbing Supplies
Large Stocks for Prompt Delivery
Catalogue on request

California Steam & Plumbing Supply Co.
671-679 Fifth Street, Corner Bluxome
SAN FRANCISCO CALIFORNIA

When writing to Advertisers please mention this magazine.
Permanent Stucco with Atlas White

STUCCO has deservedly become a most popular type of construction. One essential of good stucco is that it be permanent.

Stucco properly made from Atlas White Portland Cement is as permanent as concrete, because it is concrete. It has been proven satisfactory through years of exacting use. A wide variety of pleasing finishes are shown in our book, “The Stucco House,” a copy of which should be in every architect’s hands.

For over a quarter century Atlas Portland Cement has been deservedly known as “the Standard by which all other makes are measured.”

The panel, a strip 50 inches deep, from an actual wall, shows a rather-dry mix-applied with irregular pressure and motion of the trowel. Permanent finishes such as the one only possible with Portland Cement Stucco.

THE ATLAS PORTLAND CEMENT COMPANY
NEW YORK – PLEASANTON – CHICAGO

ATLAS WHITE PORTLAND CEMENT IS AVAILABLE IN ANY QUANTITY THROUGH MOST DISTRIBUTORS OF BUILDING MATERIALS.
THE TORMEY CO.

General Painters

Phone Franklin 5-5-9-8

1042 Larkin St., San Francisco, Cal.

Alvaline, Cementoline and other Jones-Duncan Products

MAGNER BROTHERS
PAINT MAKERS

Telephone: Market 113
414-424 Ninth St., San Francisco

“The Blazing” The Trail

We've been doing it for many years—giving the Sportsman Better Value for Quality than he ever before received. “Value at a Fair Price” in everything for the Sportsman.

SEND FOR CATALOG

The Sign of Quality

HEATING-PLUMBING

COMPLETE PLUMBING AND HEATING SYSTEMS INSTALLED IN ALL CLASSES OF BUILDINGS — ALSO POWER PLANTS

GILLEY-SCHMID CO., Inc.
198 Otis St., San Francisco
Tel. MARKET 965

BEAVER BLACKBOARD
BEAVER GREENBOARD
SCHOOL FURNITURE AND SUPPLIES—OFFICE, BANK AND COURTHOUSE FURNITURE—THEATRE AND AUDITORIUM SEATING

Rucker-Fuller Desk Co.
677 Mission St., San Francisco, Cal.
144 Higgins Bldg., Los Angeles, Cal.
432 - 14th Street - Oakland, Cal.

Pittsburg

It Insures Instant Hot Water Service

PITTSBURG WATER HEATER COMPANY
478 Sutter St., San Francisco
Phone Sutter 5625

RUSSWIN

BUILDERS’ HARDWARE

JOOST BROS., Inc.
SAN FRANCISCO AGENTS

We Carry Complete Stock:

NO BRANCH STORE
Mazda Lamps Electric Goods
KINNEAR
ROLLING DOORS

The Door that suits Your Building

THE Kinnear Rolling Door is built individually to meet the requirements of the building. It is the modern industrial door for all types of buildings. It gives protection against fire and burglary.

For endurance, perfect performance and the utmost economy—leading architects use Kinnear Steel Rolling Doors. Our Engineering Department at your service. Ask for illustrated catalog.

The Kinnear Manufacturing Co.
661-671 Field Ave.,
Columbus, Ohio
San Francisco, 525 Market St.

1 N. Shellenburg & Co., Phila.
2 Rosenbaum Elevator Co.
3 Steel and Tube Co. of America
4 Chicago N. Sb. & Milw. R. R.
5 Cushby Packing Co.

WHY?
The increased demand for these fittings during the past several months, prove that the leading Architects ask for them in their specifications on new buildings.

Approved by Boards of Health in Leading Cities

Victory Manufacturing Co.
Monadnock Bldg.
SAN FRANCISCO, CALIF.
Factory:
NILES, CALIF.

SOLD BY ALL PLUMBING JOBBERS
### Architectural and Engineering Services

#### A. D. Coleman
**Collman and Speidel**  
General Contracting  
Phone Sutter 4858

#### I. R. Kissel
*Decorator, Painter and Paperhanger*
1747 Sacramento St., Bet. Polk St. and Van Ness Ave., San Francisco

#### Robert Trost
**General Building Contractor**  
We specialize in high grade work and employ skilled labor in every branch of the building industry.  
26th and Howard Streets, San Francisco

#### P. A. Palmer
**Contracting Engineer**  
782-796 Monadnock Building, San Francisco, Cal.

#### Louis Fontanella, Phone Mission 8923
**Fontanella & Teza**  
General Contractors  
Telephone West 1285

#### Mark Teza, Phone Valencia 1625
**Fontanella & Teza**  
General Contractors  
Telephone West 1285

#### Monson Bros.
**Building Construction**  
Yard Mariposa and Bryant Streets  
Phone Market 2963  
251 Kearny Street, San Francisco  
Telephone Douglas 6419

#### Unit Construction Company
*(Incorporated)*  
Engineering and Construction  
Telephone Kearny 28  
429-36 Phelan Building, San Francisco

#### J. D. Hannah
**Contractor and Builder**  
Office: 142 Sansome Street  
San Francisco, Cal.  
Builders Exchange, 180 Jessie Street  
Telephone Douglas 2885

---

When writing to Advertisers please mention this magazine.
Advise your clients to purchase their rugs and carpets from us.

They will thank you for the advice.

Our rugs and carpets are of the very best quality, and our prices are guaranteed to be the lowest in San Francisco.

EDW. J. MARGETT
Wholesale Jobber
61 Ellis Street
Phone Douglas 2253
Opposite Century Theater

BEAUTIFUL GARDEN EFFECTS for the City and Suburban Home
MacRORIE-McLAREN CO.
Landscape Engineers and General Nurserymen
Office
Nurseries at
514-16 Phelan Building Berkeley
San Francisco San Mateo Co.

ROBERTS MFG. CO.
Lighting Fixtures
Electric Appliances
Incandescent Lamps

WILLYS FARM LIGHTING AND POWER PLANTS
663 Mission Street San Francisco

When writing to Advertisers please mention this magazine.
<table>
<thead>
<tr>
<th>Name</th>
<th>Company/Role</th>
<th>Address</th>
<th>Contact</th>
</tr>
</thead>
<tbody>
<tr>
<td>I. M. SOMMER &amp; Co.</td>
<td>Engineers and Concrete Construction</td>
<td>Phone Kearny 4582</td>
<td>401 BALBOA BLDG., SAN FRANCISCO</td>
</tr>
<tr>
<td>K. E. PARKER COMPANY, Inc.</td>
<td>General Contractors</td>
<td>Phone Sutter 5661</td>
<td>Room 515 Clunie Building, SAN FRANCISCO</td>
</tr>
<tr>
<td>R. W. LITTLEFIELD</td>
<td>Building Construction</td>
<td>357 12th Street, Room 9, Oakland, Cal.</td>
<td>Phone Lakeside 6750</td>
</tr>
<tr>
<td>H. H. HILP, Jr.</td>
<td>J. FRANK BARRETT</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BARRETT &amp; HILP</td>
<td>Concrete Construction Builders General Contractors</td>
<td>918 HARRISON STREET, near 5th, SAN FRANCISCO</td>
<td>Telephone DOUGLAS 700</td>
</tr>
<tr>
<td>A. KNOWLES</td>
<td>Contractor and Plasterer</td>
<td>442 Call-Post Building</td>
<td>San Francisco</td>
</tr>
<tr>
<td>STEELFORMS Signify ECONOMY, RAPIDITY, and EFFICIENCY</td>
<td>STEELFORM CONTRACTING COMPANY</td>
<td></td>
<td></td>
</tr>
<tr>
<td>STEELFORMS FOR CONCRETE BUILDINGS</td>
<td>C. B. Hopkins, C. E., Manager</td>
<td>CONCRETE JOIST FLOOR CONSTRUCTION</td>
<td></td>
</tr>
<tr>
<td>HILL, HUBBELL &amp; CO.</td>
<td>Manufacturers and Roofing Contractors</td>
<td>115 Davis Street</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Los Angeles</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Seattle</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Portland</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>San Francisco</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>New York</td>
<td></td>
</tr>
<tr>
<td>M. E. VUKICEVICH</td>
<td>SPENCER B. BAGGE</td>
<td>Phone Sutter 6700</td>
<td>Office, Builders Exchange, 180 Jessie St., San Francisco</td>
</tr>
</tbody>
</table>

When writing to Advertisers please mention this magazine.
THE HERMANN SAFE CO.
Manufacturers of Fire and Burglar Proof Safes, Vaults and Safe Deposit Boxes
Also Representatives for the YORK SAFE & LOCK CO. OF YORK, PA.
216-224 Fremont Street San Francisco, Cal.

MARTEN & FREDERICK
UNITED WORK SHOPS
Designers, Makers and Contractors of
FINE FURNITURE, DRAPERIES and COMPLETE INTERIORS
1374 SUTTER STREET, SAN FRANCISCO

HERBERT BECKWITH
Building Construction
Formerly with ARTHUR ARLETT
Everson Building OAKLAND

D. ZELINSKY & SONS
PAINTERS AND DECORATORS
420 TURK STREET SAN FRANCISCO

CHARLES T. PHILLIPS
CONSULTING ENGINEER
PACIFIC BUILDING SAN FRANCISCO
HEATING VENTILATION WIRING ILLUMINATION
Geo. T. Fletcher  Geo. P. Schmitt  E. L. Fletcher

**PACIFIC HEATING COMPANY**

Heating, Ventilating and Sheet Metal Work
Coal, Wood, Oil and Gas Heaters to Meet all Requirements
We Repair All Makes of Heating Appliances

**WORK GUARANTEED**
Oakland 388  Corner Second and Grove Streets, OAKLAND CALIF.

---

**Atlas Heating and Ventilating Co., Inc.**

**ENGINEERS and CONTRACTORS**

STEAM AND HOT WATER HEATING, FANS, BLOWERS
FURNACES, POWER PLANTS—SHEET METAL WORK

Phone Douglas 378  Fourth and Freelon Sts., Bet. Bryant & Brannan, SAN FRANCISCO

---

**CLARENCE DRUCKER**

**LAWSON & DRUCKER**

**PLUMBING—HEATING—CONTRACTORS**

**450 HAYES STREET**

**TELEPHONE MARKET 275**

SAN FRANCISCO, CAL.

---

**HEATING**

**VENTILATION**

**FLOOR AND WALL TILING**

**SCOTT CO., Inc.**

243 MINNA STREET  SAN FRANCISCO

---

**ALEX COLEMAN**

**CONTRACTING PLUMBER**

706 ELLIS STREET, SAN FRANCISCO  Phone FRANKLIN 1006

---

**WM. F. WILSON COMPANY**

**MODERN SANITARY APPLIANCES**

Special Systems of Plumbing for Residences, Hotels, Schools, Colleges, Office Buildings, Etc.

Phone Sutter 357  328-330 Mason Street, San Francisco

---

**W. H. PICARD**

**PLUMBING AND HEATING**

Picard & Edwards
Heating, Ventilating and Power Plants

5656 College Avenue  5662 Keith Avenue  Piedmont 7522  Oakland, Calif.

---

**CARL T. DOELL**

**PLUMBING**

**HEATING**

467 21st Street, Oakland, California  Telephone Oakland 3524

---

*When writing to Advertisers please mention this magazine.*
Mount Diablo Cement
Cowell Santa Cruz Lime

All Kinds of

Building Materials

Henry Cowell Lime and Cement Co.

Phone Kearny 2095  No. 2 Market Street, San Francisco

The Ilgair Kitchen Ventilator
is being specified by the leading architects of the country.
It makes the kitchen a joy spot—purifies the air, prevents
objectionable odors, steam and smoke from permeating the
living rooms, thereby making frequent cleaning and re-decorating unnecessary.
Specify this equipment for the next residence you design.
Your client will be pleased.

Send for Descriptive Literature

Tiltz Engineering & Equipment Co.

San Francisco  Western Representatives:  Ilg Electric Ventilating Company
479 Monadnock Building  512 Wright & Callender Bldg.
Phone Sutter 2548  Phone Automatic 66464

Cast Iron Stairs and Store Fronts

Bank and Office Railings, Elevator
Enclosures and Fire Escapes

C. J. Hillard & Co., Inc.

Nineteenth and Minnesota Streets  Telephone Mission 1763
San Francisco, Cal.

George S. MacGruer  Robert M. Simpson  Members of Builders Exchange

MacGruer & Simpson

Contracting Plasterers

Plain and Ornamental

Cement, Stucco and Artificial Stone

Phone Garfield 512  266 Tehama Street, San Francisco

When writing to Advertisers please mention this magazine.
Passenger and Freight Elevators
Made in San Francisco
Factory and Office: 166-180 Seventh Street
SAN FRANCISCO
Phones: Market 1534 and 1535

JAS. I. KRUEGER
Representing
Illinois Engineering Company, Chicago
Eureka Brass Works, Cincinnati
Manufacturers of
Vacuum and Vapor Steam Heating Materials, Power Plant Equipment
Standard Radiator and Gate Valves, Pumps for Vacuum Systems of Heating
557-559 Pacific Building, San Francisco
Telephone Sutter 7057

RAYMOND GRANITE COMPANY, Inc.
Owning and operating at Knowles, Madera County, the largest Quarry in the world
CONTRACTORS FOR STONE WORK
Designers and Manufacturers of Exclusive Monuments and Mausoleums
Main Office and Yard: No. 1 and 3 Potrero Avenue, San Francisco, California
Also at 1200 Palmetto Street, Los Angeles

CYCLOPS IRON WORKS
ICE MAKING and REFRIGERATING MACHINERY, TRAVELING CRANES
Office and Works: Telephone:
837-847 FOLSOM ST. SUTTER 3030
SAN FRANCISCO, CAL.

GRINNELL AUTOMATIC SPRINKLER GRINNELL COMPANY
OF THE PACIFIC CHEMICAL FIRE
ENGINEERS AND CONTRACTORS EXTINGUISHERS and FIRE ENGINES
VALVES 453 Mission Street, San Francisco
PIPE and FITTINGS

Fire Protection Engineering Company
ENGINEERS AND CONTRACTORS
Automatic Sprinkler Systems
Automatic Fire Alarm Systems
Watchman Detector Systems
Executive Offices and Factory
Chemical Engines
Hand Fire Extinguishers
Motor Driven Fire Apparatus
67 MAIN STREET
San Francisco, California

CLINTON CONSTRUCTION COMPANY
BUILDERS AND MANAGERS OF CONSTRUCTION
of California
136 Townsend Street
San Francisco

CORROSIRON
CHEMICAL LABORATORY DRAIN LINES AND FITTINGS
IN HIGH SCHOOLS, COLLEGES, HOSPITALS,
ENGRAVING PLANTS
Write for Our Bulletin
HARRISON and EIGHTEENTH STREETS
PACIFIC FOUNDRY COMPANY
SAN FRANCISCO
ARCHITECTS—DO YOU
know you can alter old homes, providing additional sleeping accommodations, without building on more rooms?

A living room or dining room may be converted into a bedroom at night without making any considerable change in interior arrangement by installing MARSHALL & STEARNS WALL BEDS

Comfortable—Inexpensive

MARSHALL & STEARNS COMPANY

Main Office and Showroom
1152 Phelan Building San Francisco California
Oakland Office, 1774 Broadway

The Petrium Sanitary Sink

Makes Kitchen Work Quieter

Because of the elasticity of the composition of its surface The Petrium Sanitary Sink reduces breakage and the jarring, rattle and clatter of dishes on the drainboards to a minimum. Architects, your principals will welcome your specification of the Petrium.

This is one of the many advantages that commend the Petrium to discriminating housewives.

PETRIUM SANITARY SINK CO.

FIFTH AND PAGE STREETS, BERKELEY, CALIFORNIA

The Petrium Sanitary Sink is displayed at the factory; Building Materials' Exhibits, Oakland and San Francisco; by our San Francisco distributors, M. E. Hammond, Hoosier Cabinet Store and by local representatives in the outside territory.

When writing to Advertisers please mention this magazine.
POSITIVE ELECTRIC INTERLOCK
(BAR LOCK TYPE)
Prevents Elevator Accidents Occurring at the Entrance Door
Approved by National Underwriters Laboratories—Meets requirements of Elevator
Safety Orders of Industrial Accident Commission, State of California
ELEVATOR SUPPLIES COMPANY, Inc.

ALFRED H. VOGT
GENERAL CONTRACTOR
CONCRETE CONSTRUCTION
185 Stevenson Street, San Francisco

National Surety Company of New York
The World's Largest Surety Company
Assets over $20,000,000
Pacific Coast Department: 105 MONTGOMERY ST., SAN FRANCISCO, CAL.
Frank L. Gilbert, Vice-President

PACIFIC DEPARTMENT
GLOBE INDEMNITY COMPANY
Bonds and Casualty Insurance for Contractors
FRANK M. HALL, formerly Robertson & Hall, Mgr.
444 California Street
Phone Sutter 2280
SAN FRANCISCO

PHONDOUGLAS2370
R. McLERAN & CO.
GENERAL CONTRACTORS
HEARST BUILDING
SAN FRANCISCO, CAL.
The Elevator Floor
whether in Office Building, Hotel or Department Store, is subjected to a great deal of wear and tear.

SPECIFY
INTERLOCKING RUBBER TILING
and you've provided your client's building with a Durable, Economical, Practical material that is sure to give satisfaction. Twenty tons installed in the Standard Oil Building, San Francisco. Stock on hand for immediate delivery.

NEW YORK BELTING AND PACKING CO.
NEW YORK
San Francisco Branch 519 MISSION ST. Phone Douglas 1837
Small booklet of designs mailed on request

SPECIFY BOWSER
Whether it is big installation or small, whether it is private or public garage, railroad, factory or dry cleaning plant, always specify Bowser equipment for oils and gasoline. You are assured of best service.

Our engineers will gladly serve you in planning the Lousing of gasoline and oil equipments.

Write for Booklet A-03

S. F. Bowser & Co., Inc.
Pioneer manufacturers of Self-Measuring Pumps
612 Howard St., San Francisco
1225 So. Olive St., Los Angeles
719 Corbett Bldg., Portland
Branch Offices, with Service Departments, in Principal Cities in this country and Abroad. Representatives everywhere.

Bowser Products
For Handling Gasoline and Oils Wherever Sold or Used
Filling Station Pumps and Tanks for Gasoline.
Portable Tanks for Oil and Gasoline.
Storage and Measuring Outfits for Paint Oils, Kerosene and Lubricating Oils.
Carload Oil Storage Tanks.
Power Pumps.
Dry Cleaners' Underground Naptha Clarifying Systems.
Richardson-Phenix Oil Circulating and Filtering Systems and Force Feed Lubricators.

Write for Booklets

Fig. 172
For Lubricating Oil

ACCUARTE MEASURING PUMPS
MORTENSON CONSTRUCTION CO.
CONTRACTORS FOR STRUCTURAL STEEL AND IRON
H. MORTENSON, President
Office and Shops: Corner 19th and Indiana Streets
Phone: Mission 5033  SAN FRANCISCO, CAL.

JUDSON MANUFACTURING COMPANY
Main Office:
517-521 FOLSOM STREET
Telephone Sutter 6820  SAN FRANCISCO

Federal Ornamental Iron & Bronze Co.
Bank Counter Screens and Grille Work Our Specialty
Most Modern Equipment Throughout
Recent Contracts: BANK OF ITALY, FIRST NATIONAL BANK
16th Street and San Bruno Avenue, San Francisco  Phone Market 1011

S. S. HERRICK CO.
STRUCTURAL STEEL
BUILDINGS :: BRIDGES :: TOWERS
Office and Works
Foot of Adeline Street
Oakland, Calif.
Telephone Lakeside 1460

CENTRAL IRON WORKS, Inc.
STRUCTURAL STEEL
Office 2050 BRYANT STREET  SAN FRANCISCO, CAL.

Golden Gate Iron Works
STRUCTURAL STEEL AND ORNAMENTAL IRON CONTRACTORS
Howard and 11th Streets

SCHRADER IRON WORKS, Inc.
STRUCTURAL STEEL CONTRACTORS
Fire Escapes, Waterproof Trap Doors, Ornamental Iron Work
1237-1299 HARRISON STREET  SAN FRANCISCO, CAL.
Telephone Market 337

When writing to Advertisers please mention this magazine.
Kewanee

STEEL Boilers

Thirty-five years ago
We began making Kewanee Firebox Boilers of steel because it was the best material to be had for boiler building. We have never changed from steel and never will until a better material is found. Should the time ever come when the durability of steel is surpassed by some other material Kewanee will be the first to use it for our boilers must head the list of service-giving heating units.

Tabasco Water Heaters,
Water Heating Garbage Burners, Power Boilers,
Tanks and Radiators

Kewanee Boiler Company
Kewanee, Illinois

216 Pine Street
San Francisco

420 E. 3rd Street
Los Angeles

When writing to Advertisers please mention this magazine.
Western Safety Switches
Manufactured by Western Safety Man'fg Co., Inc.
Enclosed Externally Operated Safety Switches, Knife Switches, Metal Switch and Cut Out Boxes, Safety Switch Boards
Office, 247 Minna Street SAN FRANCISCO
Telephone, Sutter 3008

Telephone DOUGLAS 2046 CHARLES FELIX BUTTE
BUTTE ELECTRICAL EQUIPMENT COMPANY
Trade Mark BEECO Registered ELECTRICAL CONTRACTORS AND ENGINEERS
530 FOLSOM STREET SAN FRANCISCO

L. SIEBERT J. GENSLER
Drendell Electrical & Mfg. Co. Incorporated
SWITCHBOARDS, PANEL BOARDS, KNIFE SWITCHES, CABINETS, THEATRE INSTALLATIONS, PROTECTIVE POWER PLANTS
1345-1353 Howard St., San Francisco Telephone Market 1753

MEYERS SAFETY SWITCH CO. MANUFACTURERS OF Enclosed Externally Operated “Safety” Switches and Electrical Sheet Metal Products
575 HOWARD ST., SAN FRANCISCO Telephone Sutter 4213

When writing to Advertisers please mention this magazine.
BUTTE ELECTRIC & MFG. CO.
DOUGLAS 145
RADIO INSTALLATIONS
WIRING FOR BUILDINGS
534 FOLSOM ST., SAN FRANCISCO

H. S. TITTLE
CONTRACTING ELECTRICAL ENGINEER
766 FOLSOM ST., SAN FRANCISCO
Phone SUTTER 4278

To Be "Low Bidder" Not Always Our Aim
"QUALITY AND SERVICE ALWAYS"
Our nation-wide organization and large experience in this field assure you always of fair estimates and absolute satisfaction.
Electrical Appliances
F. E. NEWBERY ELECTRIC CO.
Office and Show Rooms 339 Sutter St., San Francisco
Phone Sutter 521

San Francisco, Cal. Oakland, Cal. Los Angeles, Cal.
Ne PAGE, McKENNY CO.
Electrical Engineers and Contractors
Phone Sutter 2369 589 Howard St., San Francisco, Cal.

Phone Market 2541 M. FLATLAND
GLOBE ELECTRIC WORKS
Estimates Furnished on Everything Electrical
ELECTRIC SUPPLIES
1959 Mission Street, bet. 15th and 16th
SAN FRANCISCO

Browne-Langlais Electrical Construction Co.
Agents for
ROBBINS and MYERS MOTORS, PACKARD MAZDA LAMPS
313 FIFTH STREET, SAN FRANCISCO
Telephone Douglas 976

PACIFIC ELECTRIC CLOCK CO.
J. J. Estabrook
714, 717 WELLS FARGO BLDG.
SAN FRANCISCO, CALIF.

Motors Lighting Fixtures Construction
Bought, Sold, Rented, Repaired Manufactured Maintenance Supplies
SPOTT ELECTRICAL CO.
16TH and CLAY STREETS OAKLAND, CALIFORNIA
MOTT PLUMBING FIXTURES

Architects and their clients are invited to visit our Showrooms, 553-555 Mission Street, San Francisco; D. H. Gulick, Sales Agent. Los Angeles Office, 603 Central Building; J. R. Mayhew, Sales Agent.

MOTT COMPANY OF CALIFORNIA

MUELLER.....
BRASS GOODS

Recognized as the Standard of excellence in plumbing. It pays to use them, and other Mueller Brass Goods. The first cost is practically their last cost.

625 MISSION STREET, SAN FRANCISCO, CAL.

SPECIFY
STORM KING AND
AMERICAN WARM
AIR FURNACES

FURNACE FITTINGS AND REPAIRS

Montague Range and Furnace Company
327-329 JESSIE STREET
Phone Garfield 1422
826-830 MISSION STREET
SAN FRANCISCO, CALIF.

Modern Heating Plants...


JAMES A. NELSON
Heating and Ventilating Contractor

Phone, GARFIELD 1959
517-519 SIXTH ST., SAN FRANCISCO

When writing to Advertisers please mention this magazine.
ACORN BRAND OAK FLOORING
for discriminating Architects and Builders, and characteristically
a Tennessee product in every way, from the excellence of the
wood itself to the superior millwork and careful grading ••.

Strable Hardwood Co.  HARDWOOD
LUMBER
PHONE OAKLAND 245
511-545 FIRST STREET  OAKLAND, CALIFORNIA

NO GERMS HERE
HAWS IMPROVED SANITARY DRINKING
FAUCET eliminates all possibility of con-
tracting disease from dirty bulbs or unsanitary
bowls. Provided with an overhead cowl, the
drinker's lips never touch the source of supply.
A slanting stream throws the water from right
to left and away from the bubbler, instead of
straight up to fall back over the fountain head.
Recommended for Schools and Public Playgrounds.
A type used extensively by the U. S. Government.
Manufactured by
Haws Sanitary Drinking Faucet Co., Inc.
1808 Harmon Street, Berkeley,
Phone Piedmont 3742

OPEN HEARTH
REINFORCING STEEL BARS

Square Deformed—Immediate Shipment—Cut to required lengths
PACIFIC COAST STEEL COMPANY
Sales Office, Rialto Building  SAN FRANCISCO  Phone Sutter 1564

CLINTON
ELECTRICALLY WELDED WIRE FABRIC
WELDED SHEATHING, WIRE LATH
WIRE AND WIRE PRODUCTS

WICKWIRE SPENCER STEEL CORPORATION
111 Townsend Street, San Francisco
Phone Kearny 383

When writing to Advertisers please mention this magazine.
MILLER FOLDING IRONING BOARD
ELIMINATES WALL CABINET—IS INSTALLED IN KITCHEN CUPBOARD
NO PLASTER GROUNDS
CASING OR PAINTING
SAVES WALL SPACE AND LABOR
TIME AND MATERIAL
Exhibited by LANNOM BROS. MFG. CO
and sold by 362 Magnolia St., Oakland, Calif.
Send for Catalogue to W. N. MILLER
MILLWORK Manufactured and Delivered Anywhere
Plans or Lists sent us for Estimates will have Careful and Immediate Attention
Jno. Dudfield, Pres. DUDFIELD LUMBER COMPANY Joseph A. Jury,
and Manager Sec'y & Mill Supt.
MAIN OFFICE, YARD AND PLANING MILL—PALO ALTO, CALIFORNIA

SCHOOL AND THEATRE
STAGES AND EQUIPMENT
EDWIN H. FLAGG
SCENIC COMPANY, Inc.
400 Pantages Bldg., San Francisco, Cal.
Studios, 1873 Mission Street, San Francisco
1635 Long Beach Ave., Los Angeles, Cal.

A. C. SCHINDLER, President
CHAS. F. STAUFFACHER, Secretary
The Fink & Schindler Co.
Manufacturers of INTERIOR WOODWORK AND FIXTURES
BANK, OFFICE AND STORE FITTINGS
SPECIAL FURNITURE
218-228 THIRTEENTH STREET
Bet. Mission and Howard Sts.
SAN FRANCISCO, CAL.
Telephone: Market 474

O. BAMANN, President
ERNEST HELD, Vice-President
HOME MANUFACTURING CO.
BANK, STORE AND OFFICE FITTINGS
FURNITURE AND HARDWOOD INTERIORS
CABINET WORK OF EVERY DESCRIPTION
543 and 545 BRANNAN ST. Phone Kearny 1514
San Francisco, Cal.

Mullen Manufacturing Co.
BANK, STORE AND OFFICE FIXTURES—CABINET WORK OF
GUARANTEED QUALITY—CHURCH SEATING
Office and Factory:
Telephone Market 8692 64 Rausch St., Bet. 7th and 8th Sts., San Francisco

JAMES L. McLAUGHLIN
GENERAL CONTRACTOR
Phones Douglas 6645—6646 251 KEARNY STREET, SAN FRANCISCO

Dolan Wrecking & Construction Co.
(D. J. DOLAN)
Lumber, Lath, Nails, Shingles, Doors, Windows
and Plumbing Supplies, New and Second Hand
Phone Market 1261 Office and Yard, 1607-1639 MARKET ST., SAN FRANCISCO

When writing to Advertisers please mention this magazine.
United States Steel Products Co.

Rialto Bldg., San Francisco


MANUFACTURERS OF
Structural Steel for Every Purpose—
Bridges, Railway and Highway—"Triangle Mesh" Wire Concrete Reinforcement—
Plain and Twisted Reinforcing Bars—
Plates, Shapes and Sheets of Every Description—Rails, Splice Bars, Bolts, Nuts, etc.—Wrought Pipe, Trolley Poles—
Frogs, Switches and Crossings for Steam Railway and Street Railway—"Shelby" Seamless Boiler Tubes and Mechanical Tubing—"Americore" and "Globe" Rubber Covered Wire and Cables—"Reliance" Weatherproof Copper and Iron Line Wire—"American" Wire Rope, Rail Bonds, Springs, Woven Wire Fencing and Poultry Netting—Tramways, etc.

United States Steel Products Co.

OFFICES AND WAREHOUSES AT
San Francisco  Los Angeles  Portland  Seattle

When writing to Advertisers please mention this magazine.
Costs less than 3c an hour to operate

Think of It! Steam Heat by Electricity
No flame, No odor, No pipes, No furnaces, No danger, No dirt. Just attach cord to a base plug and presto!—the HULBERT ELECTRIC STEAM RADIATOR furnishes you steam heat—real honest-to-goodness Steam Heat by Electricity.

WM. J. SCHWERIN
217 RIALTO BLDG., S. F.
Telephone Sutter 4489

JOHNS-MANVILLE, Inc. of California
SERVICE TO ARCHITECTS

JOHNS-MANVILLE, Inc. of California
DISPLAY ROOM
500 POST STREET
San Francisco

phone Douglas 3775

United Alloy Steel Corporation
STARK DIVISION
Canton, Ohio
Black and Galvanized Sheets in San Francisco Warehouse
S. F. SALES OFFICE:
Carl Schulz
Sales Engineer
Santa Fe Building
San Francisco

JOHNS-MANVILLE, Inc. of California
COVERS THE CONTINENT

Asbestos Roofing
Asbestos Built-up Roofings
Klastite Expansion Joints
Carey Fibre Roof Coating
Asphalt Shingles
JONES BROTHERS ASBESTOS SUPPLY COMPANY, INC.
512 Second Street, San Francisco
Telephone, Garfield 156

Pipe and Boiler Coverings

WIRING

185 Stevenson Street, San Francisco
Phone Douglas 4832

WENTWORTH

539 Market St., San Francisco
Distributors for Sales Rooms in Oakland
Library Bureau Los Angeles Seattle

THE ARCHITECT AND ENGINEER

BUSINESS :: SYSTEMS OFFICE :: FURNITURE

JOHNS-MANVILLE, Inc. of California
SERVICE TO ARCHITECTS

JOHNS-MANVILLE, Inc. of California
DISPLAY ROOM
500 POST STREET
San Francisco

When writing to Advertisers please mention this magazine.
With our WASHING and DRYING PLANT in full operation, we can now ship promptly above SANDS fresh water washed, and steam dried, or direct from pits.

Del Monte Properties Company
Phone Sutter 6130  401 Crocker Building  San Francisco

July Features
Some Hawaiian Architecture
By LOUIS C. MULLGARVT, F. A. I. A.
Landscape Architecture in San Francisco and the Bay District
Moderate Cost Homes in Southern California

THE ARCHITECT AND ENGINEER CO., Publishers
627 Foxcraft Building, San Francisco

50 Cents a Copy  ::  $2.50 a Year
For a Fast, Comfortable Trip to

PITTSBURG
ANTIOCH
RIO VISTA
ISLETON
FOLSOM
PLACERVILLE
SACRAMENTO
MARYSVILLE
YUBA CITY,
GRIDLEY
OROVILLE
CHICO
COLUSA

Use SACRAMENTO SHORT LINE
Low Week End Fares

San Francisco Depot
Key Route Ferry
Tel. Sutter 2339

Oakland Depot
40th & Shafter
Tel. Pied. 345

SCHOOL
FURNITURE
AUDITORIUM
SEATING

MAPS
GLOBES
ATLASES

C. F. WEBER & CO.
985 Market Street
SAN FRANCISCO
222-224 S. Los Angeles St.
LOS ANGELES
RENO, NEVADA
PHOENIX, ARIZONA

THE HYLOPLATE BLACKBOARD

When writing to Advertisers please mention this magazine.
Metal Lath vs. The Field

RECENT distortion tests conducted in Omaha to show the best possible type of exterior wall construction proves Back Plastered Metal Lath to be the best possible. You will note from the chart that at the greatest number of pounds pressure (3,500) back plastered Metal Lath showed a distortion of one-half inch. At this pressure it had not cracked nor did it show any signs of weakening. From the chart, the tests on other types of construction may be observed. Types No. 3 and No. 4 started to crack at points indicated. The chart proves the success of Metal Lath. As a result the building codes of a great many cities will undoubtedly be changed.

THE picture shows how the test was conducted. Heavy timbers were placed on the scale, which was connected with the lever shown leading to the jack. As the pressure of the jack was increased, the load was registered directly on the scale beam. Maximum pressure was forced against the wall of back plastered Metal Lath but it did not crack.

NOT only this test, but also a test conducted by Armour Institute, shows the superiority of Metal Lath over other forms of construction. The Armour test was to determine what form of wall construction made the best insulator. Again Metal Lath proved that "Metal Lath was against the field." Just as Metal Lath is becoming a means for better and more economical building construction, Herringbone Rigid Metal Lath is becoming THE Metal Lath in great demand today. It has proven its success to many architects and builders as well as being entirely satisfactory to the owner.

The General Fireproofing Co.
20 BEALE STREET
SAN FRANCISCO, CALIF.

When writing to Advertisers please mention this magazine.
OTIS ELEVATORS

The Architect or Engineer can specify "Otis Elevators," assured that the responsibility of the Otis Elevator Company extends beyond satisfactory installation. Buildings equipped with Otis Elevators enjoy the advantage of the prompt service and careful inspection rendered by any of our hundred offices. Such service means your clients' gratitude.

Otis Elevator Company

Offices in all principal cities of the world
2300 Stockton Street
San Francisco, Cal.

When writing to Advertisers please mention this magazine.
Specify
LOWELL
Rubber Covered
WIRE

PITTSBURGH
MIRRORED
REFLECTORS

LAMP CORDS
AND CABLE

For Show Windows
and
Special Lighting
GUARANTEED for 5 years
The Efficient Lighting Reflector

Inspection Tag on Every Coil

Best By Test

CONNECTICUT
Telephones and Annunciators

For Apartment House and School System
Have given satisfaction for the past 54 years

Let us solve your Intercommunicating Problems

Special attention given the
Architects Electrical Problems

MYERS & SCHWARTZ
MANUFACTURERS AGENTS

90 New Montgomery Street
and
Furniture Exchange
San Francisco

1119 So. Los Angeles St.
Los Angeles
1626 Eighth Avenue
Seattle, Wash.
The "Millbrae" Closet

has an extra large tank

With its extra large tank, massive bowl and simple lines, the "Millbrae" is especially attractive in appearance. Its stain-proof surface is easily kept clean and it retains its snow-white appearance permanently.

All "West Coast" Two-Fired Vitreous China Plumbing Fixtures are of the highest quality and cost no more than other standard high-grade fixtures.

Write for our Catalog

WEST COAST Porcelain Manufacturers

424 Oceanic Building, San Francisco

Plant, Millbrae, California