



PROPERTY OF THE
LIBRARY OF THE
FEB 1 1934
WOMAN'S COLLEGE
UNIVERSITY OF NORTH CAROLINA

THE ARCHITECTURAL

PUBLIC WORKS • MODERNIZATION • HOUSE HEATING

RECORD

N O V
1 2 3 3

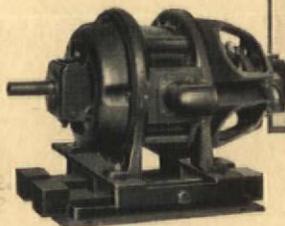
“...there's a motor
under my bed!”

THE whir is most annoying! I hear it when I lie down. When I sit up, it stops!” A puzzled room clerk recently listened to such a complaint. He investigated.

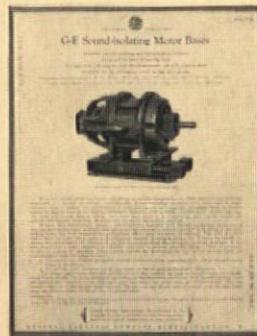
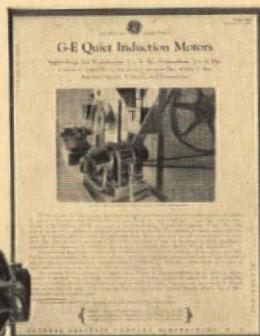
No, the motor wasn't under the bed. In fact, the offender was finally located many floors away. Vibration, inaudible at the motor, had been transmitted and amplified by the building structure. A G-E *quiet* motor replaced it, and the trouble disappeared.

Situations like this combine to place joint responsibility for noise suppression on everyone concerned with the design and application of machinery in hotels, hospitals, clubs, etc., where quietness is of paramount importance.

General Electric recognizes its part of this responsibility, and, to reduce noise, offers a complete line of *quiet* motors and sound-isolating bases. Complete information on these new developments is available through any G-E sales office.



G-E *quiet* motor mounted on G-E sound-isolating base



Would you like copies of these valuable new publications, GEA-1695, "G-E Quiet Induction Motors", and GEA-1714, "G-E Sound-isolating Bases"? If so, write to General Electric, Dept. 6-201, Schenectady, N. Y.

200-715

GENERAL  ELECTRIC



La Quinta Hotel at Indio, Calif.
Gordon B. Kaufmann, Architect

THE ARCHITECTURAL RECORD

NOVEMBER, 1933
VOLUME 74
NUMBER 5



M. A. MIKKELSEN
Editor

A. LAWRENCE KOCHER
Managing Editor

C. THEODORE LARSON
Technical News Editor

JOHN M. WILLIAMS
General Manager

J. A. OAKLEY
Business Manager

F. H. COMTOIS

W. Pope Barney
Ernest Born
Theodore Crane
Howard T. Fisher
Fiske Kimball
William Stanley Parker
Henry Wright
Contributing Editors

Published monthly by
F. W. DODGE
CORPORATION
115-119 West 40th Street
New York

Truman S. Morgan, *President*
Sanford D. Stockton, Jr., *Secretary*
Howard J. Barringer, *Treasurer*

PHOTOGRAPHS OF NEW YORK: THE METROPOLIS VIEWED AT DUSK. Photographs by Samuel H. Gottscho Frontispiece

HOUSING PROGRESS UNDER THE PUBLIC WORKS ADMINISTRATION 333-335

ILLUSTRATED NEWS 336, 337

CHARLES A. PLATT: AN APPRECIATION. By S. Merrell Clement 338

OBJECTIVES OF ARCHITECTURAL EDUCATION. By Ramsay Traquair, Professor of Architecture, McGill University in Montreal 339

TIME ZONING AS A PREVENTIVE OF BLIGHTED AREAS. By K. Lönberg-Holm 340, 341

NIAGARA FRONTIER FOOD TERMINAL, BUFFALO, N. Y. George S. Rider Company, Architects and Engineers; Hudson and Hudson, Associate Architects 342-344

PORTFOLIO OF LOW-COST HOUSES: La Quinta Hotel and Cottages at Indio, California—Gordon B. Kaufmann, Architect; House of Miss Marion Parsons at Syracuse, New York—Charles H. Umbrecht, Architect; House of Richard D. Greene at Syracuse, New York—Charles H. Umbrecht, Architect 345-353

APARTMENT OF KATHARINE BRUSH IN NEW YORK. Joseph Urban, Architect; Irvin L. Scott, Associate 354-357

IRVING AIR CHUTE COMPANY, BUFFALO, NEW YORK. Hudson and Hudson, Architects 358

PORTFOLIO OF CURRENT ARCHITECTURE: House of William Everdell, Manhasset, Long Island—Roger H. Bullard, Architect; House of Ellery S. James, East Hampton, Long Island—Roger H. Bullard, Architect; House of Ralph Franks at Pasadena, California—Palmer Sabin, Architect; House of E. M. Sherman at Pasadena, California—Palmer Sabin, Architect; House of Henry Heide, Jr., at Fieldston, New York—Julius Gregory, Architect; Chouinard School of Art, Los Angeles, California—Morgan, Walls & Clements, Architects; Grade School at Western Springs, Illinois—Johnck and Ehmman, Architects; Administration and Library Building, Meadville Theological School in Chicago—Denison B. Hull, Architect 359-376

ARCHITECT AND CLIENT A CENTURY AGO. By Hobart Upjohn, Architect 377-382

MODERNIZATION AND ALTERATION: Remodeled Dining Room, Hotel Knickerbocker in Chicago—J. R. Davidson, Designer; Architecture and Real Estate Under One Roof—Thomas Williams, Architect; A Chain Store for Women's Dresses, Hollywood, California—J. R. Davidson, Designer 383-390

A NEW SYSTEM OF CONCRETE CONSTRUCTION. By Fletcher Pratt 391, 392

TECHNICAL NEWS AND RESEARCH: HEATING EQUIPMENT FOR SMALL HOUSES. By Theo. F. Rockwell, Instructor in Heating and Ventilating, Carnegie Institute of Technology 393-407

CORRESPONDENCE; ALUMINUM FOIL INSULATION 408

A PREFABRICATED HOUSE AT ELMHURST, ILLINOIS. General Houses, Inc. 409

STATISTICAL REVIEW OF PROGRESS IN PUBLIC WORKS PROGRAM. By L. Seth Schnitman, Chief Statistician, F. W. Dodge Corporation 410

THE ARCHITECT'S LIBRARY 12, 14 (adv.)

BUILDING TRENDS AND OUTLOOK. By L. Seth Schnitman, Chief Statistician, F. W. Dodge Corporation 20, 22, 24 (adv.)

Yearly subscription: United States and Possessions, \$3.00; Canada and Foreign, \$5.00; Single Copy, 50c. Member Audit Bureau of Circulations and Associated Business Papers, Incorporated. Copyright, 1933, by F. W. Dodge Corporation. All rights reserved. Entered as second class matter May 22, 1902, at the Post Office at New York, N. Y., under the Act of March 3, 1879. Printed in U. S. A.



When you plan

Provide for building-wide HEARING

Large buildings of many kinds should include Western Electric Program Distribution Systems—which pick-up, amplify and distribute Sound wherever loud speakers are installed.

The source of speech or music may be microphones, records played on a Western Electric Reproducer Set or radio broadcasts brought in by Western Electric Receivers. Volume may be controlled as desired. Tonal quality is natural, clear—as you would expect of a product of Bell Telephone makers.

This equipment has numerous uses. It provides music or other entertainment in any number of rooms at once—enables everyone in any number of rooms to hear clearly—delivers instructions or announcements to many points simultaneously.

The Western Electric Radio Frequency Distribution System should also be considered for apartment houses, hotels, hospitals. Using only one antenna, this System provides antenna and lead-in facilities for as many as 3000 radios, assuring highest quality reception for each.

Sound transmission experts will gladly assist you in planning installations to meet specific needs.

Western Electric

PROGRAM DISTRIBUTION AND PUBLIC ADDRESS SYSTEMS

Distributed by GRAYBAR Electric Company

GRAYBAR ELECTRIC CO., Graybar Building, New York, N. Y.	A. R. 11-33
Gentlemen: Please send me complete information on:	
Western Electric Program Distribution System <input type="checkbox"/>	Western Electric Radio Frequency Distribution System <input type="checkbox"/>
NAME.....ADDRESS.....	
CITY.....STATE.....	



HOTELS



APARTMENTS



SCHOOLS



HOSPITALS



AUDITORIUMS



AIRPORTS

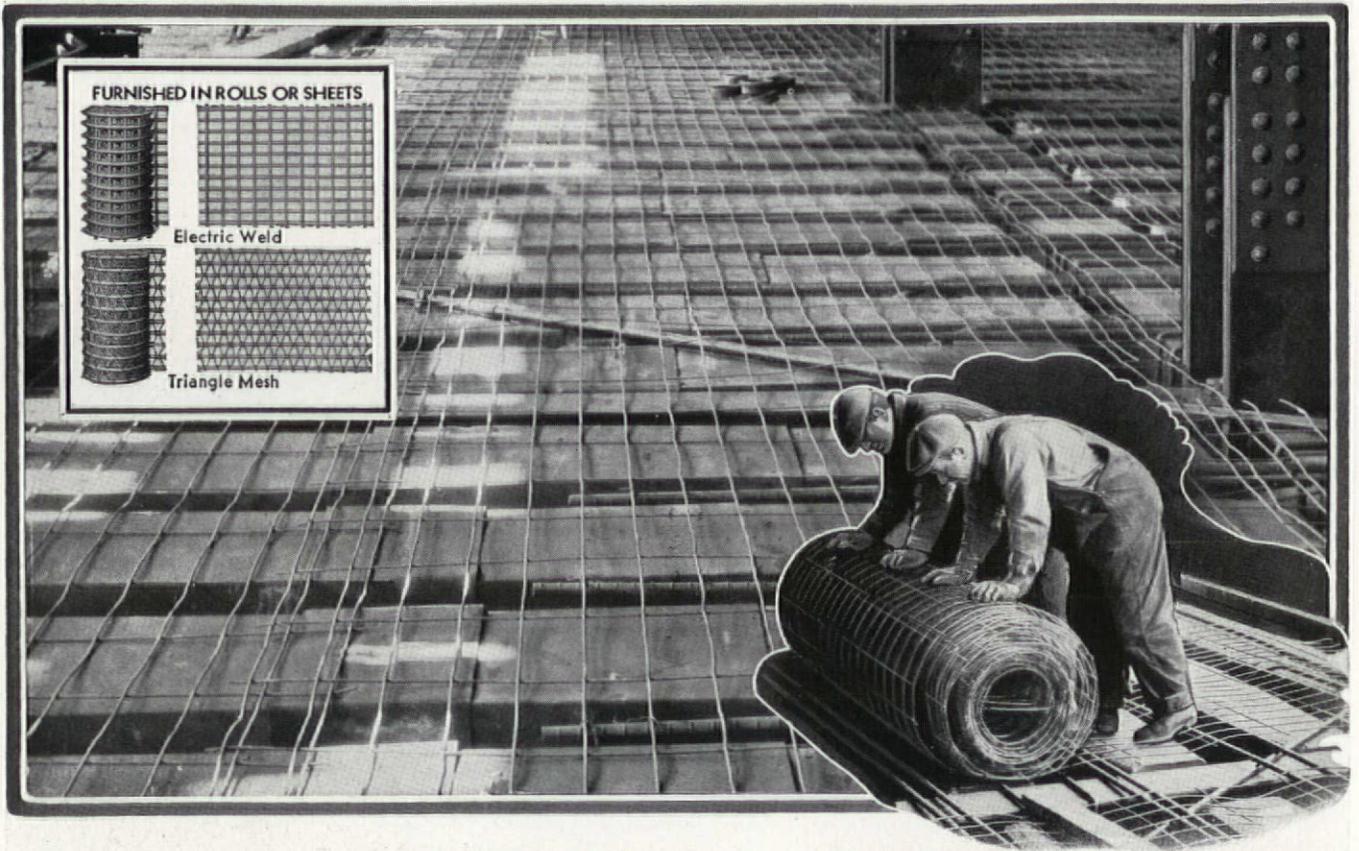


RAILROAD STATIONS

Today's Buyers and Builders are **KITCHEN-CONSCIOUS**

A GREAT nation-wide educational and promotional campaign has "sold" the General Electric Kitchen to millions. Women everywhere have seen, heard or read about it. Those who are going to build or buy will *prefer* the home that includes a General Electric Kitchen. Progressive architects, builders, realtors and building managers have proved the sales value of G-E Kitchens, by

incorporating them in their new construction, reconditioning or modernizing programs. Write for proof. Ask for information on model plan arrangements and specifications. They are available without charge or obligation through the G-E Kitchen Institute planning service. Address General Electric Company, Specialty Appliance Sales Department, Section CR 11, Nela Park, Cleveland, Ohio.



EXCEPTIONAL STRENGTH *plus* LOW INSTALLATION COSTS

BUILDING for quality is one thing—doing it at a reasonable cost is another. In Concrete Floor Arch Reinforcement—either cinder or stone—American Steel & Wire Company Wire Fabric offers exceptional economy and service advantages. First—it is made of Cold Drawn Wire—and this means exceptional strength through the close distribution of

high yield point steel. Second—it is easy to handle, which results in low installation costs. Third—its superior quality is the result of over 100 years of wire making experience. Constantly uniform, and offering many other advantages that you will wish to know about in detail. Interesting information is available—and will be forwarded on request.

AMERICAN STEEL & WIRE COMPANY
WIRE FABRIC
THE STEEL BACKBONE OF CONCRETE



1831  1933

AMERICAN STEEL & WIRE COMPANY

208 South La Salle Street, Chicago
 94 Grove Street, Worcester

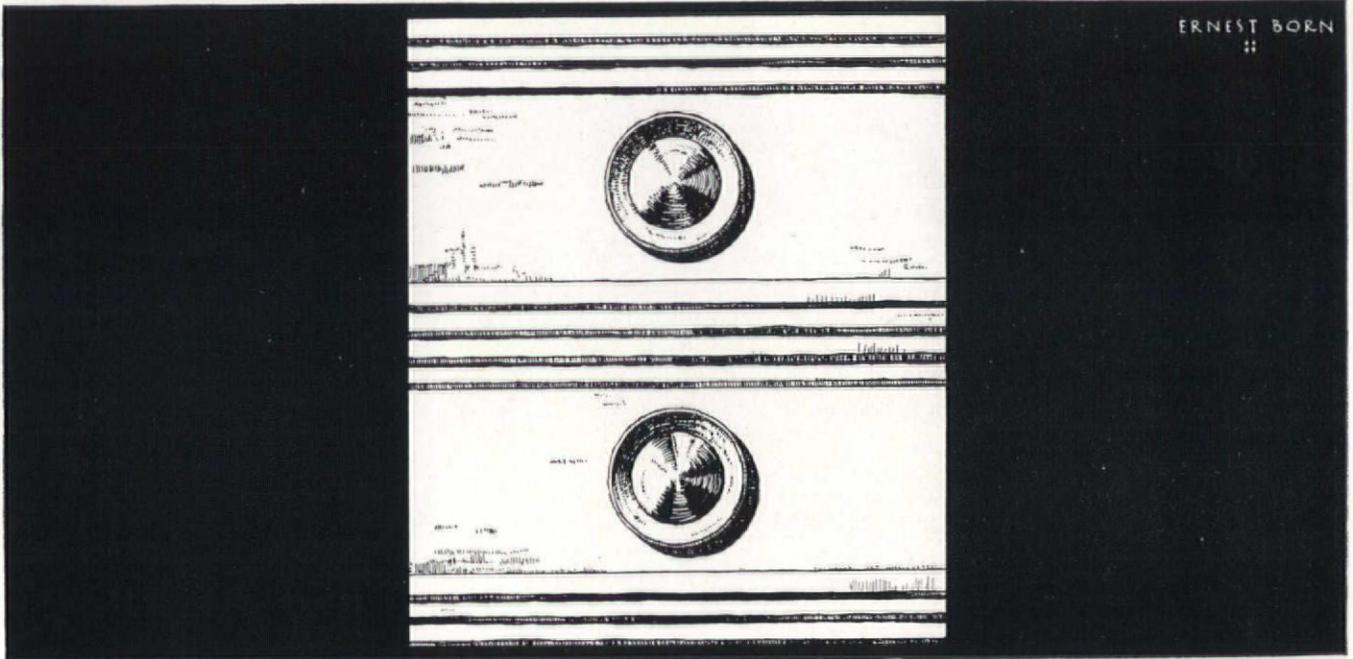
SUBSIDIARY OF UNITED STATES STEEL CORPORATION
 AND ALL PRINCIPAL CITIES

Empire State Bldg., New York
 First National Bank Bldg., Baltimore

Pacific Coast Distributors: Columbia Steel Company, Russ Building, San Francisco

Export Distributors: United States Steel Products Company, New York

ALCOA ALUMINUM SPANDRELS



THE SILVERY LINE OF BEAUTY, ECONOMY, LIGHTWEIGHT.

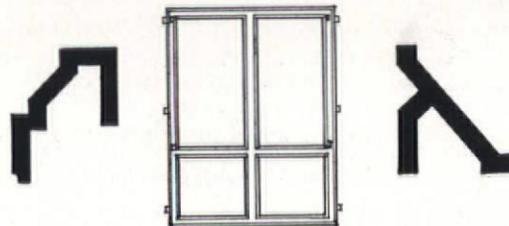
They form the perfect link between window sills above and window head below—yet Alcoa Aluminum Spandrels weigh at most only $1/3$ as much as those of other metals. That means lighter loads from the roof line right down to the footings. Tons of weight less to truck through the streets. Tons of weight less to erect.

ALCOA Aluminum brings lasting beauty and attractiveness; it doesn't rust, it resists corrosion, and it forms no mineral salts to streak or drip-stain adjoining surfaces—it minimizes maintenance costs for the owner. Choose from a variety of tones and finishes

from dull lead-gray to high-lighted satin finish. Colored or painted finishes too, if you wish. When you use ALCOA Aluminum, the spandrel design is limited only by the imagination of the designer—the most intricate and detailed work can be faithfully reproduced in this metal.

There's probably an ALCOA representative in your city who will gladly give you information and printed matter about this modern metal and its many architectural applications. ALUMINUM COMPANY of AMERICA; 1867 Gulf Building, PITTSBURGH, PENNSYLVANIA.

The light strong alloys of ALCOA Aluminum come in sheets, plates, extruded shapes, castings suitable not only for spandrels but also for window frames, elevator doors, grilles, store-fronts, etc. The silhouettes shown directly above and below are typical of the many extruded shapes available in ALCOA Aluminum.



ALCOA ALUMINUM



PENNVERNON WINDOW GLASS INVITES COMPARISONS!

Compare it with other glasses for **REFLECTION . . .**



PENNVERNON
triumphs!



PENNVERNON Window Glass possesses the quality of reflectivity in an unusually high degree—on both sides of the sheet. To prove it, we suggest the following actual comparisons: Compare a sample of Pennvernon with samples of other glasses . . . and see how much truer, clearer and sharper Pennvernon's reflections are. Or better still, find a building in your community glazed with Pennvernon

. . . and compare the appearance of its windows with that of the windows in some other building glazed with some other sheet glass. You will see the difference in reflectivity immediately . . . for Pennvernon reflects objects with a fidelity second only to that of fine plate glass.

Pennvernon's superior powers of reflection are the result of our special manufacturing process which gives the glass not only denser,

smoother surfaces, but greater transparency, permanent whiteness, new freedom from defects, and better color transmission.

Specify Pennvernon Window Glass . . . and get the highest reflection value yet attained in sheet glass making. Pennvernon is available in single and double strength, and in thicknesses of $\frac{3}{16}$ " and $\frac{1}{32}$ ", at the warehouses of the Pittsburgh Plate Glass Company in all principal cities, and through progressive glass jobbers and sash and door manufacturers. Write for samples. Pittsburgh Plate Glass Company, Grant Building, Pittsburgh, Pa.



Specify **PENNVERNON WINDOW GLASS**

THE SOURCE OF THIS PRODUCT PREDICTS ITS SERVICE



THE qualities which make for long-lasting, trouble-free pipe are many and varied. They result from properly coordinating the numerous factors involved in development, manufacture and servicing. That is why J & L Complete Ownership Control has so important a bearing on the quality and serviceability of J & L Pipe.

Straight joints, free from excess scale; accurate mill threads; couplings properly tapped; the right bending and free thread-cutting qualities; uniformly heavy galvanizing—all of these are results of painstaking procedure based on the experience gained by J & L in manufacturing iron and steel for 83 years.

Write for the 88-page catalog of J & L Pipe. It is a valuable handbook for pipe users, and will be sent to you without obligation on your part.

**J&L
OWNERSHIP
CONTROL**

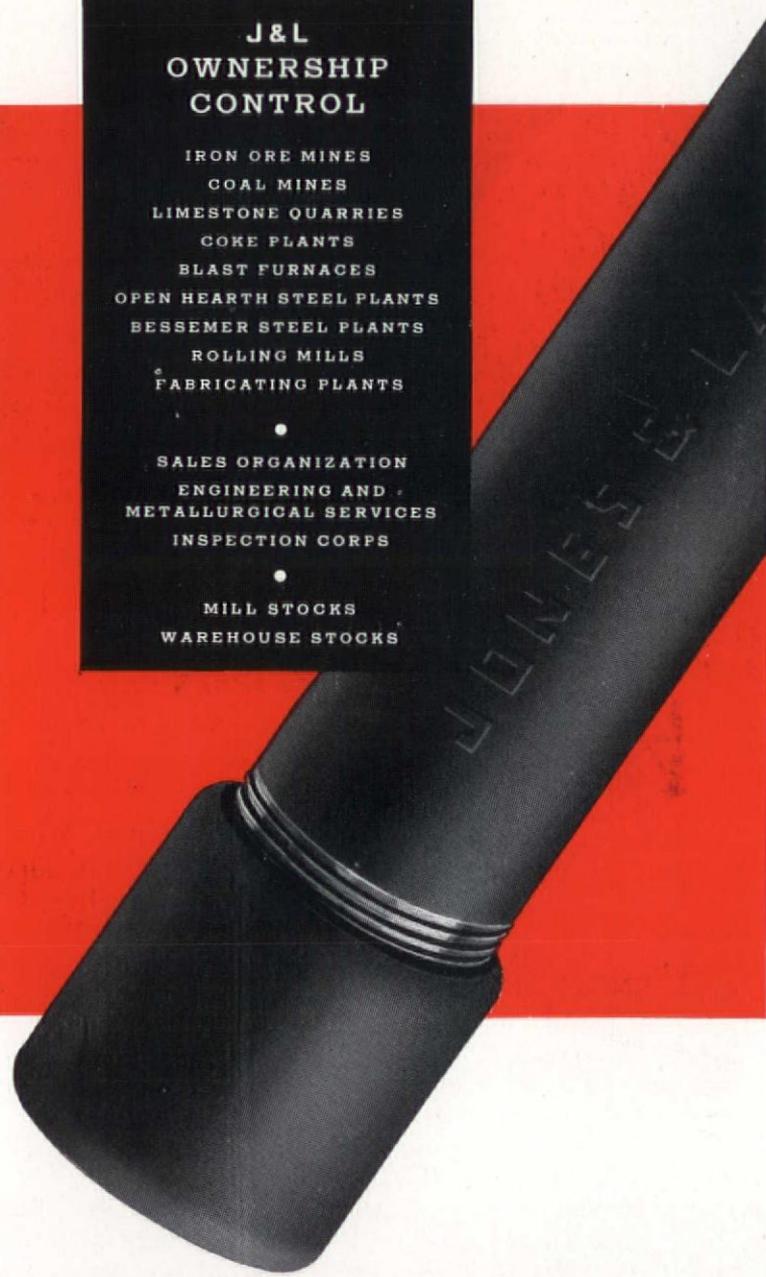
IRON ORE MINES
COAL MINES
LIMESTONE QUARRIES
COKE PLANTS
BLAST FURNACES
OPEN HEARTH STEEL PLANTS
BESSEMER STEEL PLANTS
ROLLING MILLS
FABRICATING PLANTS

•

SALES ORGANIZATION
ENGINEERING AND
METALLURGICAL SERVICES
INSPECTION CORPS

•

MILL STOCKS
WAREHOUSE STOCKS



J & L CONSTRUCTION PRODUCTS
LIGHT WEIGHT ROLLED CHANNELS
JUNIOR BEAMS — STEEL PIPE
BARS for CONCRETE REINFORCEMENT
STANDARD STRUCTURAL SHAPES
STEEL PILING — NAILS — TIE WIRE
FABRICATED STRUCTURAL WORK
including Steel Plate Construction

JONES & LAUGHLIN STEEL CORPORATION

AMERICAN IRON AND STEEL WORKS

JONES & LAUGHLIN BUILDING, PITTSBURGH, PENNSYLVANIA

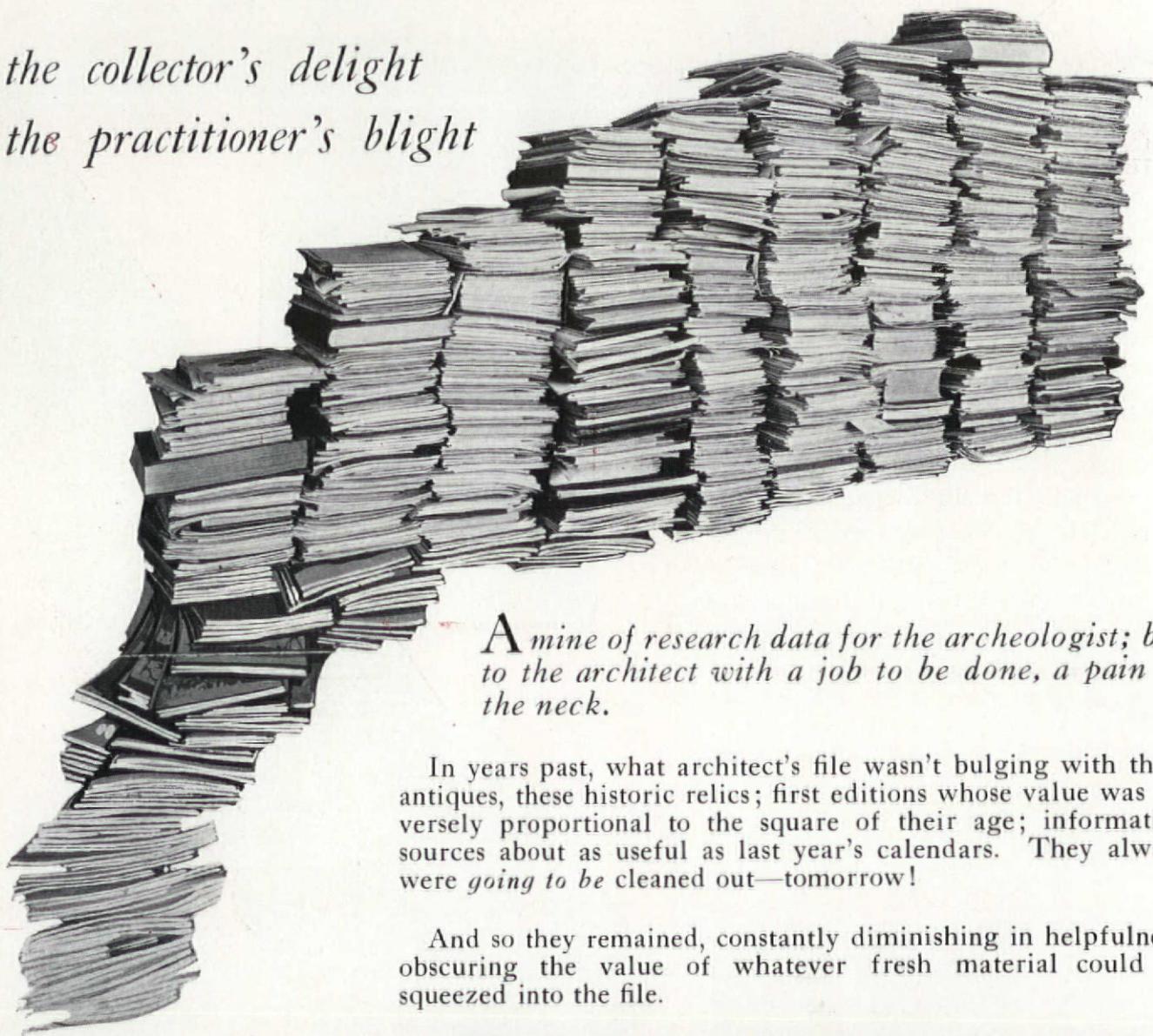
Sales Offices: Atlanta Boston Buffalo Chicago Cincinnati Cleveland Dallas Denver Detroit Erie Los Angeles
Memphis Milwaukee Minneapolis New Orleans New York Philadelphia Pittsburgh St. Louis San Francisco
Warehouses: CHICAGO CINCINNATI DETROIT MEMPHIS NEW ORLEANS PITTSBURGH

Canadian Representatives: JONES & LAUGHLIN STEEL PRODUCTS COMPANY, Pittsburgh, Pa., U. S. A., and Toronto, Ont., Canada

**J&L
STEEL**

Early American CATALOGUES

*the collector's delight
the practitioner's blight*



A mine of research data for the archeologist; but to the architect with a job to be done, a pain in the neck.

In years past, what architect's file wasn't bulging with these antiques, these historic relics; first editions whose value was inversely proportional to the square of their age; information sources about as useful as last year's calendars. They always were *going to be* cleaned out—tomorrow!

And so they remained, constantly diminishing in helpfulness, obscuring the value of whatever fresh material could be squeezed into the file.

TODAY it's no trick at all for architects to avoid the pitfalls hidden in this out-dated accumulation. Hundreds of manufacturers, acting cooperatively, have formed the habit of revising their catalogues annually and distributing the new editions filed in Sweet's. When you want up-to-date information on up-to-date products, consult the Sweet's file.

YOUR NEW 1934
SWEET'S FILE
of manufacturers' catalogues is now on the press. Distribution will start in December.

SWEET'S CATALOGUE SERVICE

Division of F. W. Dodge Corporation

119 WEST 40th STREET, NEW YORK

INTRODUCING

REYNOLDS METALLATION*

WHAT IT IS Reynolds Metallation consists of pure sheets of highly polished aluminum cemented to one or both sides of strong kraft paper.

WHAT IT DOES Provides low-cost, permanent insulation for any structure. For the average house, Reynolds Metallation can be specified at an added cost of less than \$100. The polished metal surface reflects approximately 95% of all radiated heat that strikes it. Proved by scientific tests, and through actual use in mechanical refrigerators, refrigerator cars, truck bodies and ships.

Depending on type and method of installation, Reynolds Metallation provides insulation equivalent to .72 to 1.42 inches of cork or rock wool, .8 to 1.6 inches of insulating board, 20.0 to 40.0 inches of concrete.

In addition, it is wind-proofing, moisture-proofing, vermin-proofing and fire-resisting.

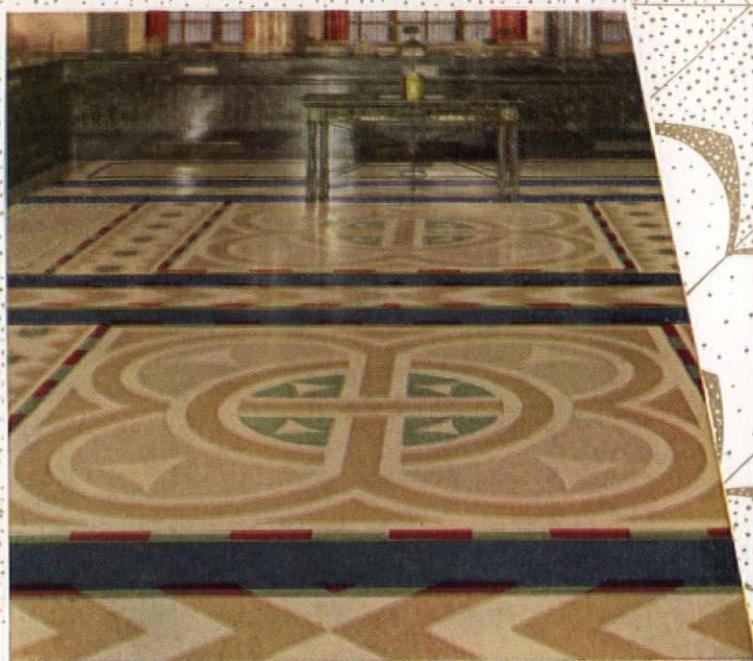
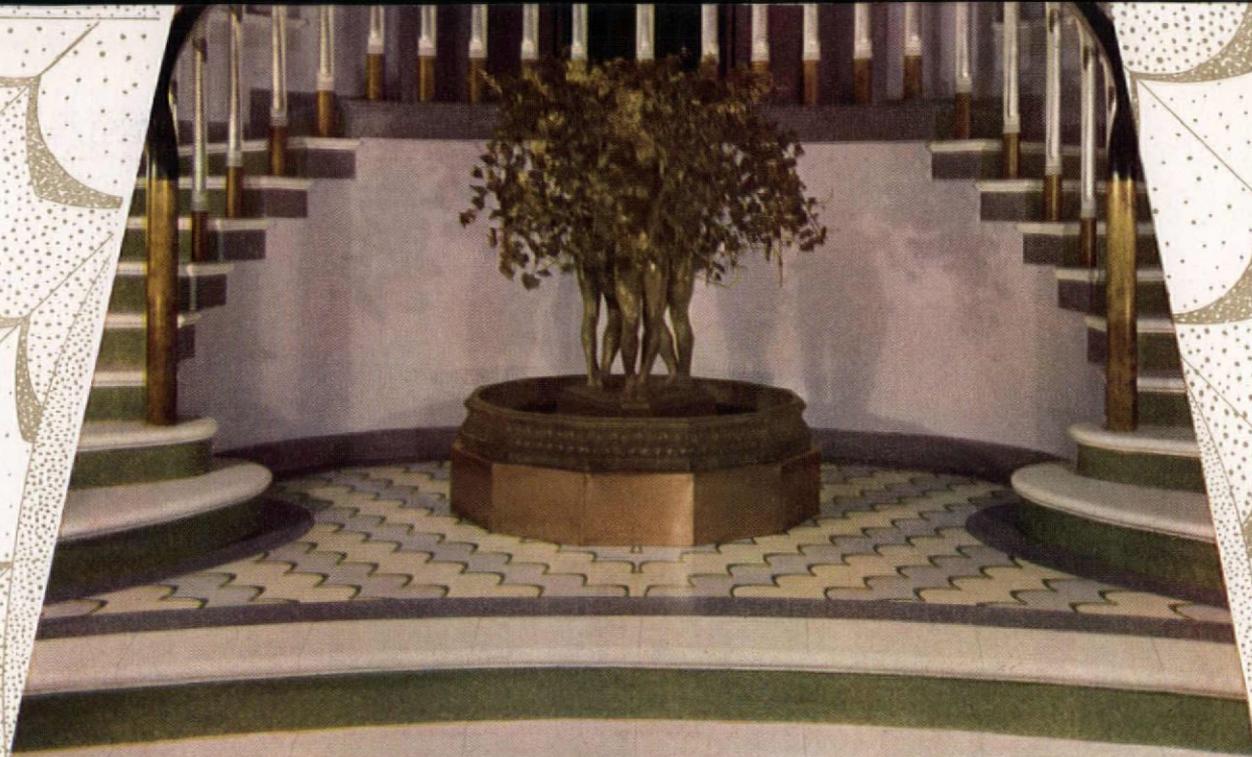
HOW IT IS USED Reynolds Metallation is made in three types, for application between or against framing members (studs, joists, rafters) or over sheathing or rough flooring, replacing blanket type insulation or building paper.

SAMPLES, PRICE LISTS AND BOOKLETS WILL BE FURNISHED ON REQUEST

★ Metallation is the trade-name for polished sheet aluminum products made only by the Reynolds Metals Company, Incorporated.

REYNOLDS METALS COMPANY, INCORPORATED

19 RECTOR STREET, NEW YORK CITY



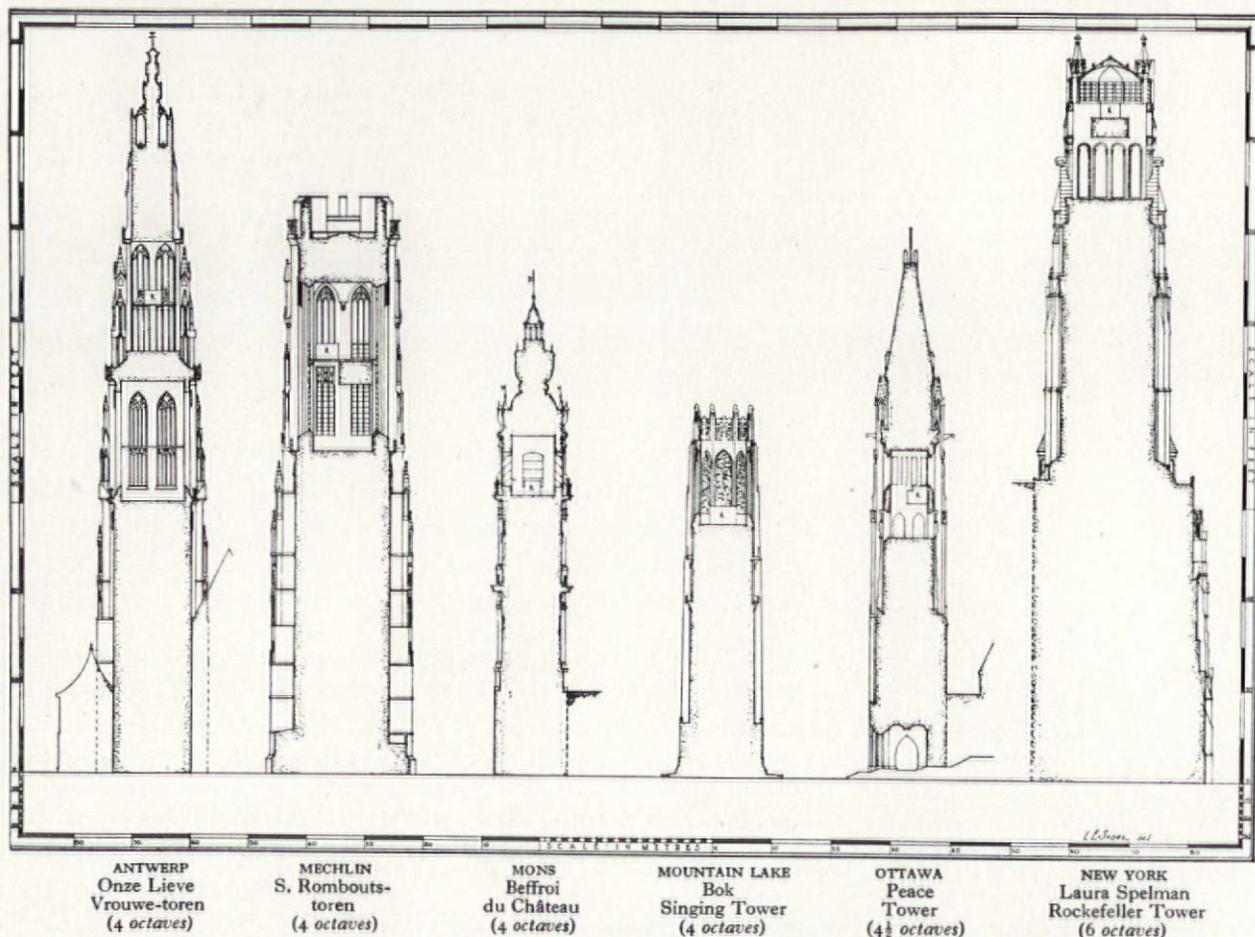
*Y*OUR individual ideas dictate the color and design of fine terrazzo floors, for they are strictly custom-built. They can be as brilliant and striking or as soft and subdued as *you* want them to be. *You* plan the designs. At *your* fingertips, in fine terrazzo, lie the vivid hues of Chicago's Fair or the quiet shades of an evening sky. And once your color and pattern ideas are cast into a fine terrazzo

floor, they are there to stay, for such a floor is durable and retains its original colors. All providing, of course, that it really is *fine* terrazzo, which is made with white portland cement—much of it with Atlas White. Terrazzo contractors are glad to give you full details, or write Universal Atlas Cement Co. (*Subsidiary of United States Steel Corporation*), 208 South LaSalle Street, Chicago.

ATLAS WHITE FOR FINE TERRAZZO
 ATLAS WHITE PORTLAND CEMENT — PLAIN OR WATERPROOFED



THE ARCHITECTS' LIBRARY



SECTIONS OF THREE OLD AND THREE MODERN TOWERS, SHOWING RELATIVE HEIGHTS AND SIZES OF BELL-CHAMBERS AND AMOUNT OF OPENINGS. (From THE CARILLON.)

THE CARILLON. By Frank Percival Price. Humphrey Milford, London; and Oxford University Press: 114 Fifth Avenue, New York City. 228 pages. 37 plates. \$7.50

The author is carillonneur for the Dominion Government at the Peace Tower, Houses of Parliament, Ottawa, Canada; he was formerly carillonneur at the Laura Spelman Rockefeller Memorial Carillon in New York. He is also the first graduate outside Europe to receive a diploma from the Carillon School in Belgium, the only chartered carillon school in existence today. It is therefore with great understanding and love of the subject that he has written of the origin, history and development of bells and the modern carillon.

The early history of bells and the carillon is told and the story of the first Hemony carillon; through the nineteenth century and then, with a change in architectural style, a renaissance in the art of carillon making. The modern carillon and bells are fully described, together with interesting chapters on the music itself. Delightful studies are included of carillon players of former times as well as modern carillonneurs, together with a chapter on the audience. There is a list of existing carillons and an alphabetical index of carillonneurs. The plate section of bells, carillons, carillonneurs and carillon towers is desirably informative.

Several chapters are devoted to carillon architecture: location, style, method of hanging bells, design, clock or chiming apparatus and exterior design are discussed.

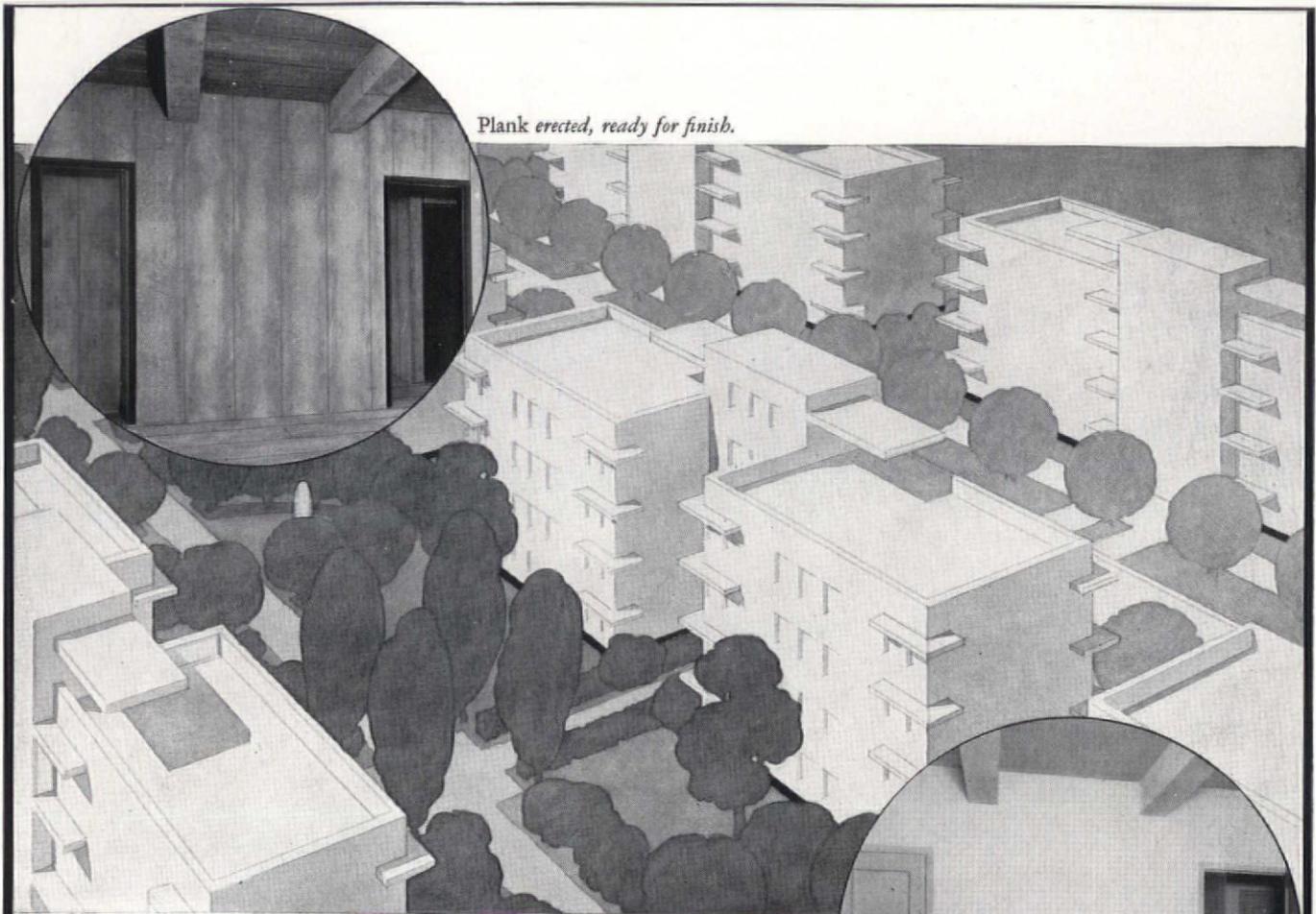
ALL THE WAYS OF BUILDING. By L. Lamprey. The Macmillan Company: 60 Fifth Avenue, New York City. 304 pages. Illustrated by Helène Carter. \$3.50

This is a story of architecture for boys and girls. The author sketches in such historical backgrounds as will unite the subject with other school studies.

The evolution and progress of architecture from the first building of caves and huts by the wild men of the Stone Age, and the wigwams and tents of Indian and Gypsy, Egyptian building, the beauty of Babylon, Assyrian work, the glory of Greece, the Roman empire, are all skilfully portrayed, to arouse a child's delight and interest.

Through the Middle Ages, describing the beauties and history of palaces, manors and playhouses, the author leads to the shelters of the old settlers. The final chapter of the book, "Steel and Concrete," is devoted to the skyscraper of today.

The book is illustrated and the publishers invite young readers to write the author for information or replies to questions on architectural matters of interest to them.



Plank erected, ready for finish.

Finished wall and ceiling of Plank.

This plank **solves** many of the tough problems of **HOUSING PROJECTS**

Gypsteel Gypsum Plank is a sturdy, easy-to-use, adaptable, fireproof construction unit, ideally suited to all types of housing . . . individual or group, small or large . . . for floors — roofs — partitions.

Briefly, this *Plank* is a solid slab of factory-cast gypsum, 2 inches thick, 15 inches wide, up to 10 feet long—tongued and grooved just like a wood plank.

It is highly *fire-resistive* . . . a most important factor when you are figuring costs of maintenance.

It can be sawed, cut, nailed or bored like wood. No detailed specifications are necessary. *Gypsteel Plank* is standardized for easy handling, planning, ordering.

We will be pleased to send you a booklet which gives all the details about this unit. Ask for the *Gypsteel Gypsum Plank Handbook*.

GYPSTEEL PLANK

Trade-Mark

U.S. Pat. No. 1,854,396. Canadian Pat. No. 328,519
Other U.S. and Foreign Patents Pending

STRUCTURAL GYPSUM CORPORATION
535 Fifth Avenue, New York

ERECTING STEEL BUILDINGS AND STRENGTHENING STEEL BRIDGES BY WELDING. By Professor Frank P. McKibben. American Welding Society: 33 West 39th Street, New York City. 24 pages. Illustrated. 35c.

This is a paper presented by the author at the Annual Meeting of the American Welding Society. Professor McKibben traces the growth of the adoption of welding in the building codes of the various cities and municipalities and gives a table showing more than 129 towns and municipalities which have included welding in their building codes. He indicates the importance of theory, gives practical methods for studying the stresses in riveted and side welded joints. This is followed by useful information on structural details for welding, gas analysis, estimating welding for multi-story buildings and methods used in important design work. He also touches on the various processes of welding and welding wire.

The second half of the paper is devoted to the strengthening of wrought iron and steel bridges by welding. In this portion the author indicates how modern traffic developments have necessitated changes and how this may be best done. He gives practical information on the qualifications of welders, typical welded bridge details, permissible stresses and test results. Flame cutting and welded steel homes are also covered in this report.

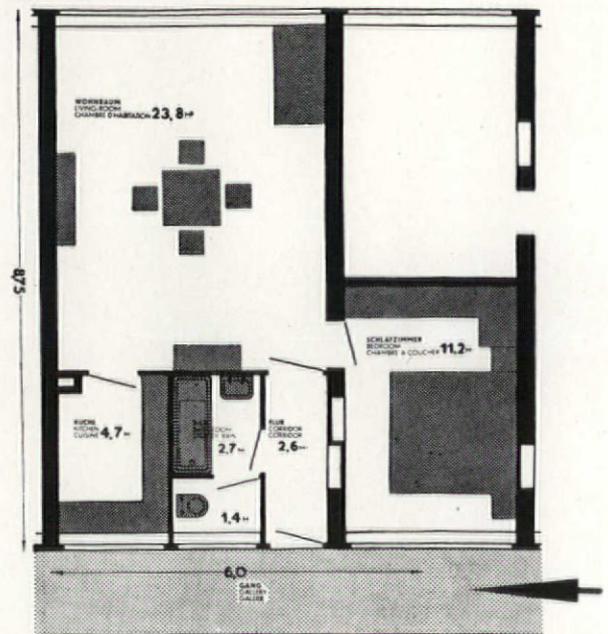
OUTLINES OF THE HISTORY OF ARCHITECTURE. Part II. Medieval Architecture. By Rexford Newcomb, M.A., M.Arch., A.I.A. John Wiley & Sons, Inc.: 440 Fourth Avenue, New York City. 308 pages. Illustrated. \$3.50

This volume is a revised and enlarged edition of the original work which was published some years ago, composed of a digest of Professor Newcomb's lectures at the University of Illinois. The Outlines, of which this is one of four parts, have been in continuous use at this and other schools of architecture.

There are three main divisions to the book: (1) the early Christian style, (2) Romanesque architecture, and (3) Gothic architecture, all treated according to the various schools and countries. Each class is further divided into concise reports on environmental influences including (A) Land—geography and topography; geology and materials on hand; climate; (B) People—history; religion; social, political and economic conditions. The architecture is also divided into sections, with descriptions of the structural system, the decorative system, classes of buildings, examples of note and general characteristics of the style. An excellent bibliography follows each chapter. The author also suggests research topics and subjects for sketches or tracings.

All text and illustrations, composed of outline maps of countries treated, are on right-hand pages, the facing pages being reserved for students' notes and sketches.

FRANKFURT A. M.

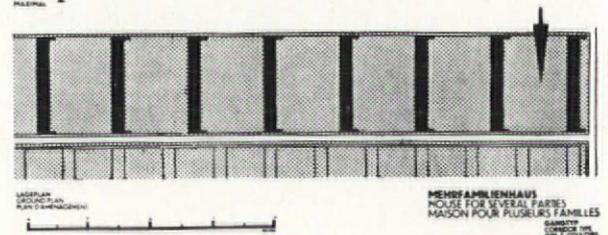
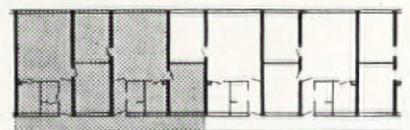


WOHNFLÄCHE
FLOOR AREA
SURFACE HABITABLE 46.-M

UNBAUTER RAUM
CUBIC VOLUME
CUBAGE 165.9M

FENSTERFLÄCHE
WINDOW AREA
SUPERF. DES FENÊTRES 133M

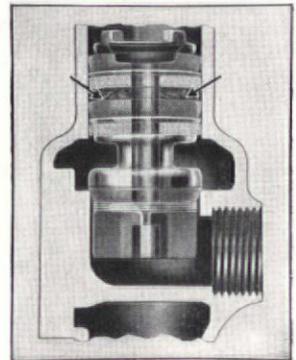
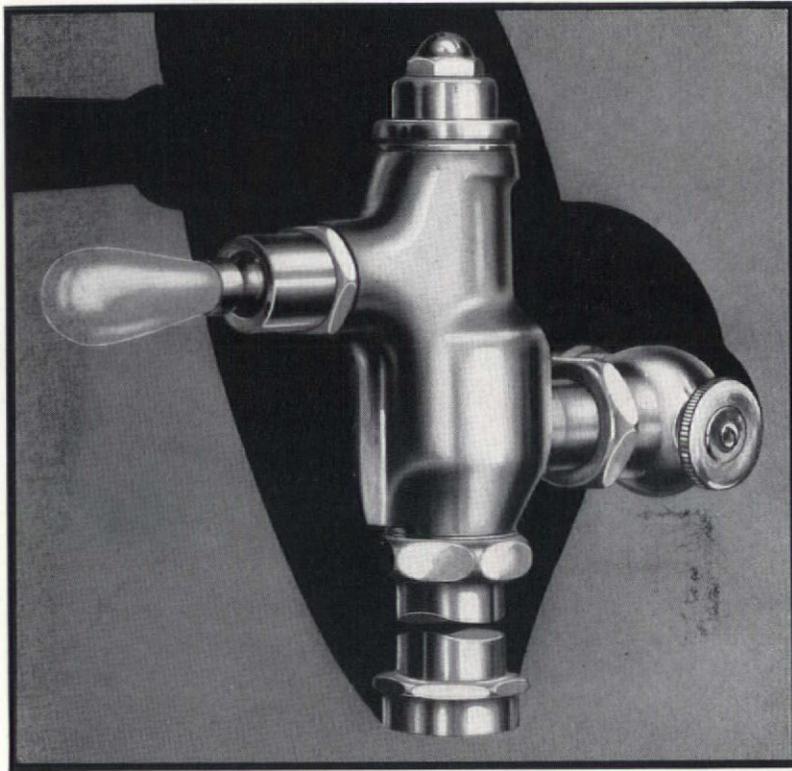
BETRIEBZ. ANZAHL VON ZIM. HOMES IN USE
OPERATING
MAXIMUM 2



A Page from DWELLINGS FOR LOWEST INCOMES.

DWELLINGS FOR LOWEST INCOME. Edited by International Congress for New Building, Zurich. Julius Hoffmann Verlag: Stuttgart. 100 plans. RM 6.80

Here are published results based on the second International Congress for New Buildings and on an exhibition by the Municipal Office of Architecture in Frankfurt-on-Main. Short English summaries are given of the following essays, originally in German and French: Analyses of the Fundamental Elements of the "Minimum House" Problem, by Le Corbusier and Pierre Jeanneret; The Dwelling for the Living Income Earner, by Ernst May, Frankfurt-on-Main, Municipal Councillor of Architecture; The International Congresses of Novel Architecture, by S. Giedion, Zurich; The Organization of Minimum Apartment Construction, from a paper read by Victor Bourgeois; The Minimum Dwelling and the Building Regulations, taken from a report by Hans Schmid, of Basle, architect; Excerpt of the Report of Walter Gropius of Berlin About "Sociological Foundations of the Minimum Dwelling."



Yes, the only Flush Valve that LUBRICATES ITSELF!

THE self-lubricating feature gives the Scovill Flush Valve a priceless twofold advantage. . . . *The valve works smoother and easier. It lasts longer than the ordinary type.* Both points every architect wants to consider carefully when he writes his plumbing specifications.

There's no secret to this self-lubricating feature and why it makes a better flush valve. Look at the cut-away illustration. Each valve plunger has chamber in which a lubricant is permanently packed. This keeps the leather washer soft, pliable—and provides a film that stops the washer from wearing against the cylinder wall. Scovill developed this

idea first—and protected it by exclusive patent.

There are other important features of the Scovill Flush Valve worth keeping in mind. . . . Easy adjustment from the *outside*, without cutting off the water. Self-cleaning by-pass to prevent clogging. No water hammer. And efficient operation even under low pressures, given sufficient volume.

These features give your clients the kind of service, satisfaction and savings that reflect favorably on your judgment. Do you have full information about the Scovill Flush Valve available for ready reference? Send for our catalog, complete with roughing-in dimensions. Yours without obligation.

*Winners of the Architects' Competition
sponsored by the Scovill Manufacturing Co.*

*Class A Problem: Mr. Roi L. Morin
9125 View Avenue, Seattle, Wash.*

*Class B Problem: Mr. Bernard R. Klekamp
104 S. Dearborn Street, Chicago, Ill.*

SCOVILL MANUFACTURING COMPANY
PLUMBERS' BRASS GOODS DIVISION
WATERVILLE • CONNECTICUT

*Scovill Flush Valves, Shower, Bath and Lavatory Equipment, Tubular and
Miscellaneous Plumbers' Brass Goods*



SCOVILL

ARCHITECTS' ANNOUNCEMENTS

David R. Brooks, architect, has opened an office in Suite 604, 233 West 42nd Street, New York City.

Lucien E. D. Gaudreau, architect, announces the removal of his office to 9 East Hamilton Street, Baltimore, Maryland.

C. W. Huff, Jr., architect, announces the opening of an office for the practice of architecture at 209 Builders' Exchange Building, Richmond, Virginia.

Ian Crawford MacCallum, architect, announces the removal of his office to 19 North Washington Street, Winchester, Virginia.

COMPETITION AWARDS

Winners in the competition sponsored by the Scovill Manufacturing Company are: Class A—Roi L. Morin, 9125 View Avenue, Seattle, Washington; Class B—Bernard R. Klekamp, 104 South Dearborn Street, Chicago, Illinois.

A.I.A. REGIONAL DIRECTOR

Stephen F. Voorhees of New York City has been elected regional director of the American Institute of Architects for the New York Division. He succeeds the late Albert L. Brockway of Syracuse. Mr. Voorhees, a member of the firm of Voorhees, Gmelin and Walker, 101 Park Avenue, is chairman of the Code Committee of the Construction League of the United States. He is a past president of the New York Chapter of the Institute.

TOWN PLANNING COURSES

Werner Hegemann, international authority on town planning, will reach New York early in November. He will lecture at the New School for Social Research, 66 West 12th Street, New York, where he will give two courses on town planning.

The first course on Social and Economic Problems in Town Planning will deal with urban decentralization, replanning, housing, garden cities, transportation, layout of streets, open spaces, civic centers. The subject of the second course will be Civic Art and Modern Tendencies in Architecture.

FRENCH ARCHITECT HERE ON SCHOLARSHIP

H. Walbert of Paris, graduate of the Ecole des Beaux Arts and professor of water colors at the American School of Art at Fontainebleau, has been named the Delano and Aldrich Travelling Scholar by the Committee on Education of the American Institute of Architects, according to an announcement by Charles Butler, chairman of the Committee.

During his course of studies at the Ecole des Beaux Arts, Walbert was awarded five medals and

CALENDAR OF EXHIBITIONS AND EVENTS

Until November 12	"A Century of Progress," International Exposition at Chicago.
November 5- December 10	Annual Philadelphia Water Color Exhibition, to be held at the Pennsylvania Academy of the Fine Arts, Broad Street, Philadelphia.
1934 February 5-9	Third International Heating and Ventilating Exposition, to be held at Grand Central Palace, New York City.
Until June, 1934	Remodeling Competition, conducted by the Good Housekeeping Studio, 57th Street and Eighth Avenue, New York City.

the Guadet Prize. He has received the French Government Diploma. In 1928 and 1929 he served as architect of an archaeological expedition to Irak, and last year received the Blumenthal prize, founded by George Blumenthal of New York to encourage French art and letters. This year he was awarded the Silver Medal of the Societe des Architectes Diplomas par le Gouvernement.

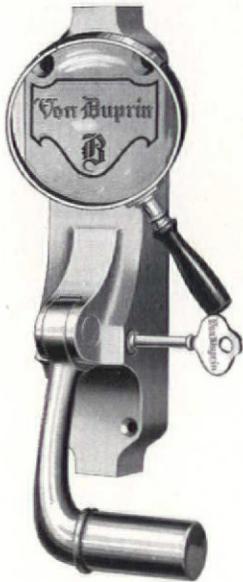
PROF. HUDNUT NEW HEAD OF COLUMBIA ARCHITECTURAL SCHOOL

Changes in the curriculum of the School of Architecture of Columbia University, and the appointment of Prof. Joseph Hudnut as Acting Dean, are announced by President Nicholas Murray Butler. The educational policies of the School, President Butler explained, will be developed to meet new conditions in the profession of architecture, and will provide a more realistic approach to America's problems in building and design. Prof. William A. Boring, head of the School since 1919, has been granted leave of absence for 1933-1934.

HOUSING STUDY GUILD

During October the Housing Study Guild, 400 Madison Ave., New York City, carried forward the first two studies in its program. The first is a preliminary analysis of a 30-acre tract in a large eastern city, to determine its availability for industrial housing at low costs which would be acceptable under the program of the PWA Housing Division. This study, which was undertaken at the joint request of the property owners and of the Housing Division, may not be published in its entirety, but the Guild will make available a report on its conclusions from the study, its method of approach to this typical problem, the types of information sources consulted and their effectiveness, etc.

The Guild is also continuing its study looking toward the establishment of standard forms for the reporting and analysis of data on housing projects, together with the formulation of a standard terminology. Before publication this study will be submitted to architects, housing bodies, and others in various sections of the country for criticism. Those who have made similar or related studies are urged to communicate with the Guild.



See Sweet's
Pages C430-C431



ELIMINATING UPKEEP COST

By the strength and durability of their working parts the old Type B (cast) Von Duprins set new records for low maintenance costs.

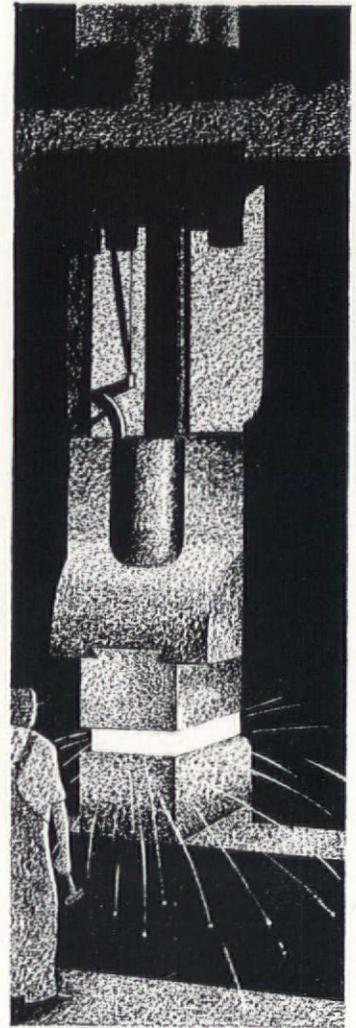
The new drop-forged devices are more than three times as strong, the exterior parts being forged under pressures up to 1,300,000 pounds, with the working members forged from bronze bearing metals having 175-225 Brinnell tests.

No one can say how long these new devices will wear, but we believe their life to be at least a century beyond that of any buildings now being erected.

During this long life the denseness of the parts, their extreme resistance to wear, their close fit, insure the practical elimination of upkeep expense.

VONNEGUT HARDWARE CO.

INDIANAPOLIS, IND.



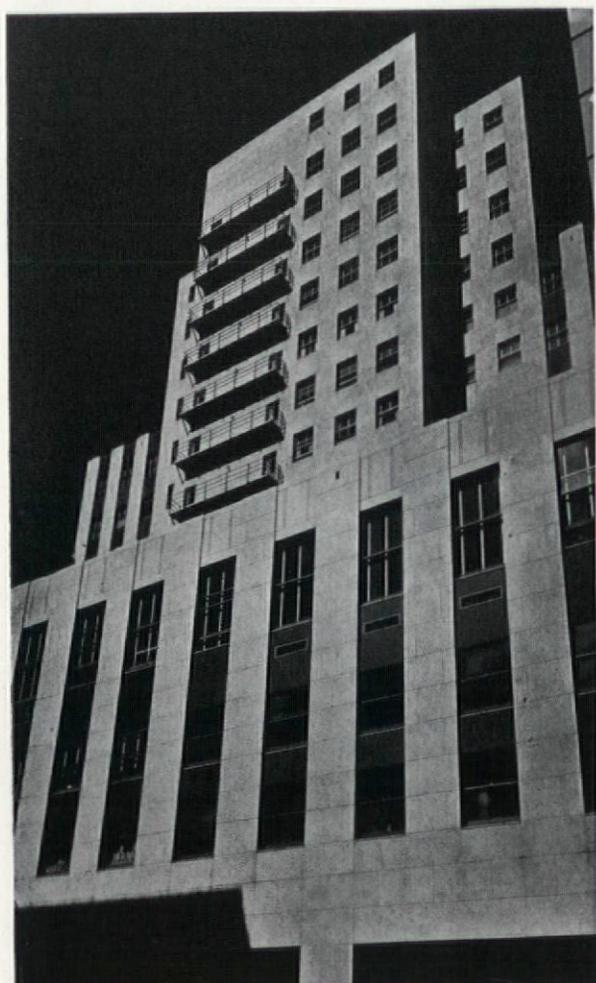
Von Duprin

LISTED AS STANDARD BY UNDERWRITERS' LABORATORIES

Features in
the December
Issue . . .



SOUTHERN STATE PARKWAY ON LONG ISLAND



Kurt B. Florman

MEDICAL ARTS BUILDING
DULUTH, MINNESOTA
ERICKSON & CO., ARCHITECTS

PARKS, PARKWAY AND ROADSIDE BUILDINGS—PUBLIC AND PRIVATE. By Gilmore D. Clarke, Landscape Architect, Westchester County Park Commission. Among the construction projects which the PWA is authorized to support with loans and subsidies are (a) missing connections in main highway systems, (b) development of existing but unimproved park areas and (c) parkways which will preserve scenic features for public enjoyment. Engineering projects of this character imply the construction of service and concession buildings on public land and of buildings catering to motor traffic and to holiday crowds on adjacent private land. These include shelter and locker buildings, filling stations, cafeterias, roadhouses, roadside camps and the like.

PORTFOLIO OF PARK, PARKWAY AND ROADSIDE BUILDINGS.

CHECK LIST FOR AFTER-PROHIBITION ALTERATIONS IN HOTELS, RESTAURANTS AND CLUBS. By J. O. Dahl, editorial director of Hotel Management and Restaurant Management.

PORTFOLIO OF MODERNIZATION AND ALTERATION WORK.

DESIGN REQUIREMENTS FOR DISTILLERY PLANTS. By Joseph Douglas Weiss, architect.

MEDICAL ARTS BUILDING, Duluth, Minnesota. Erickson & Co., architects. This type of building, housing physicians, surgeons and dentists, has prospered in the larger cities during the depression, and is consequently being extensively introduced in cities of moderate size.

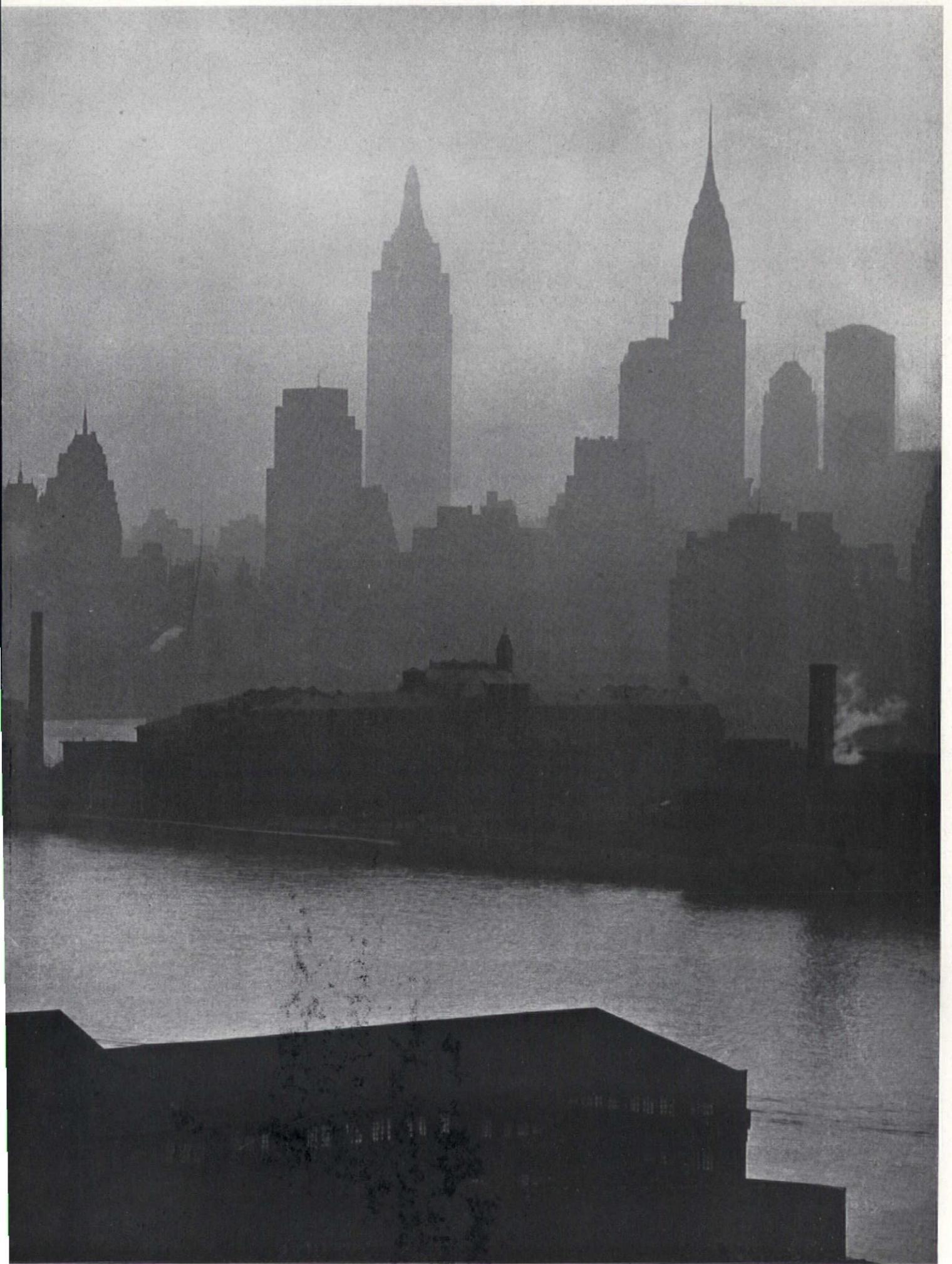
WHEN ESTIMATES RUN TOO HIGH. A systematic cost-cutting procedure saves time and insures accuracy of analysis. This is supplied in the form of a check list of items where costs vary substantially under existing market conditions, technological resources and construction methods.

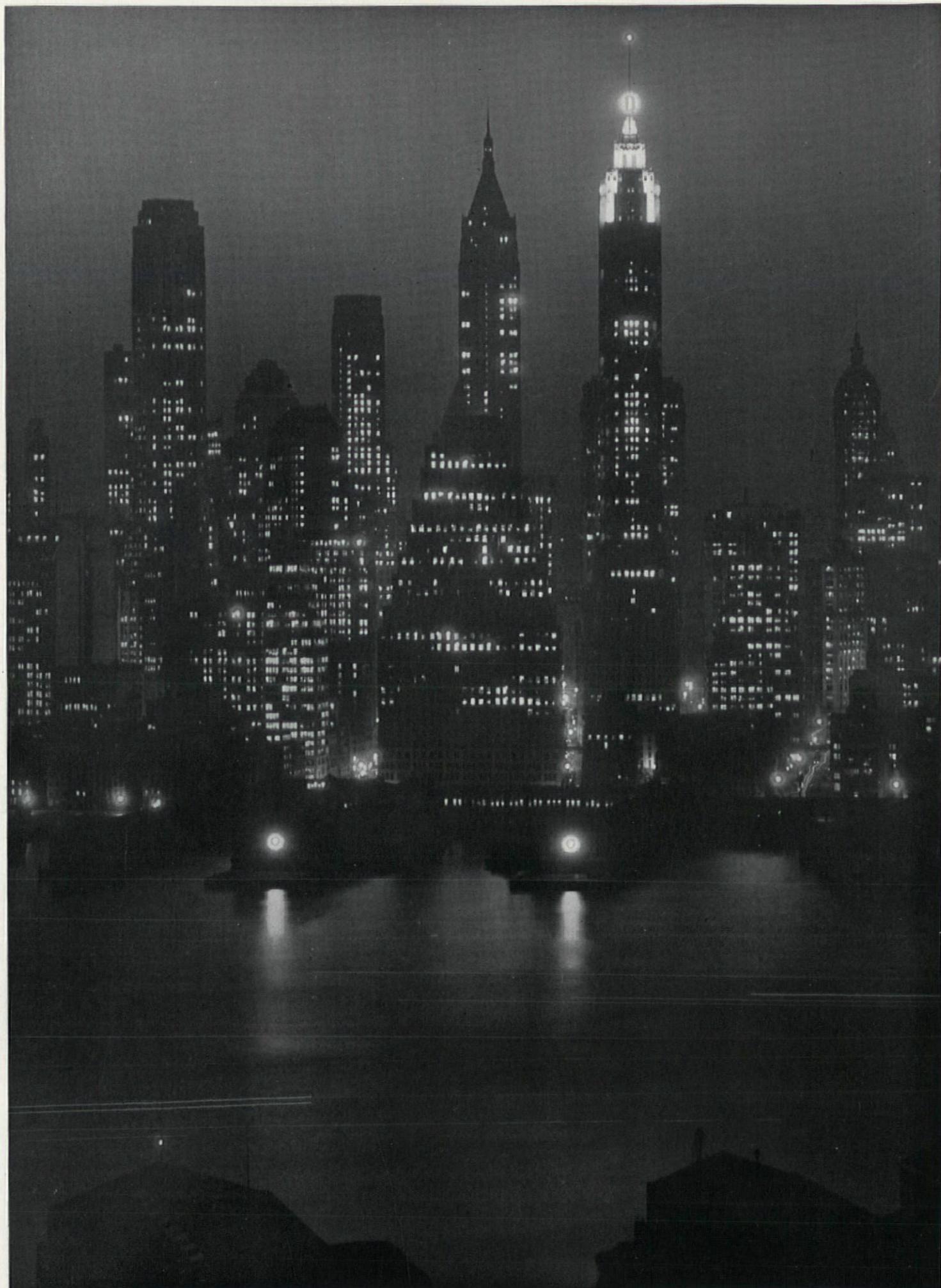
PHOTOGRAPHS OF NEW YORK
By SAMUEL H. GOTTSCHO

THE METROPOLIS
VIEWED AT DUSK



Samuel H. Gottscho





Samuel H. Gottscho

THE ARCHITECTURAL RECORD

NOVEMBER, 1933

VOLUME 74 — NUMBER 5

A STATEMENT FROM ROBERT D. KOHN, DIRECTOR OF HOUSING

So far the Public Works Administration has had nothing directly to do with the engagement of architects for projects on which they are going to make loans. School buildings, hospitals, and other structures of an institutional nature, which are eligible under the general "Public Works definition," as well as housing projects presented for our consideration, all come in completely "supplied" with architects and engineers. These men have been, of course, selected either by the municipalities and states or by the local corporations presenting the housing projects. Where Federal public buildings are involved, the plans are in charge of the Fourth Assistant Secretary of the Treasury. The Public Works Administration has no official knowledge of how the architects are selected there nor is it officially concerned in the matter.

HOUSING PROGRESS UNDER THE PWA*

FEDERAL HOUSING CORPORATION PROJECTED BY ADMINISTRATION

Plans are under consideration by the Public Works Administration for the construction of low-rent and slum-clearance projects in large cities at Federal expense. These projects, it is contemplated, will be built without the assistance of the municipalities, and rented or sold direct by a Government corporation formed for that purpose. Incorporation papers have already been prepared for the Federal housing unit, to be under the general direction of Secretary Ickes, the Public Works Administrator.

According to newspaper accounts, the Government housing plan has gained the indorsement of Secretary Ickes partly because of his dissatisfaction at the rate at which acceptable construction projects are being submitted by private enterprise. Mr. Ickes has stated, however, that the new proposal does not indicate displeasure on the part of the Public Works Administration toward housing projects which have been aided during the past few months from the public works fund. The efforts toward creation of the proposed Federal housing corporation are proceeding in line with the speeding up of President Roosevelt's plans for housing and feeding the destitute.

HOUSING PROJECTS UNDER TENTATIVE APPROVAL

Sixteen low-cost housing and slum-clearance projects have been granted tentative approval by the Public Works Administration with allocations

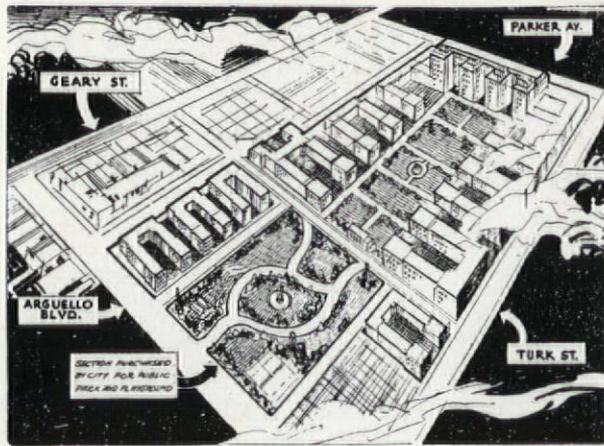
*A statistical review of progress under the Public Works Administration appears on page 410 of this issue.

of Federal loans aggregating to date approximately \$44 million:

Neptune Gardens, Inc., Boston.....	\$3,500,000
Spence Estate Housing Corporation, Brooklyn..	2,025,000
American Federation of Full Fashioned Hosiery Workers, Philadelphia.....	845,000
Commonwealth Housing Corporation, New York	3,210,000
Suburban Housing Association, Hutchinson, Kan.	40,000
Indianapolis Housing Project.....	4,460,000
Neighborhood Association, St. Louis.....	500,000
Euclid Housing Corp., Euclid, Ohio.....	1,000,000
University Students Housing, Raleigh, N. C....	168,000
Limited Dividend Corp., Cleveland, Ohio.....	12,000,000
Hillside Housing Project, Bronx, N. Y.....	5,184,458
Hallet's Cove Garden Homes Project, Astoria, Long Island, N. Y.....	2,975,000
Hillcreek Homes Corp., Philadelphia, Pa.....	1,290,000
Roosevelt Terrace Housing Corp., San Francisco	3,230,000
Techwood, Inc., Atlanta, Ga.....	2,600,000
University Housing Corp., Atlanta, Ga.....	1,212,500

Descriptions of these housing projects have already appeared in preceding issues of THE ARCHITECTURAL RECORD, with the exception of the following, recently announced:

Hillcreek Homes Corporation, Philadelphia. The buildings will consist of six-room residences and three-story apartments providing 1,620 rooms and it is hoped that the very low rental of \$7.50 per room may be attained. The site is adjacent to the Tacony Creek Park, within walking distance of an extensive industrial area, and approximately six miles from the City Hall. The limited dividend corporation, which will borrow the money, will have on its Board of Directors, J. Stoddell Stokes, President of the Pennsylvania Museum of Art, Samuel Price Wetherill, Jr., Vice-President of City



Perspective drawing, reproduced from San Francisco Chronicle, of the Roosevelt Terrace housing development in San Francisco which has received tentative approval for a loan of \$3,230,000 from the Public Works Housing Division. The project will provide approximately 886 apartments with 3,048 rooms. Miller and Pflueger are the architects.

Planning Commission; Bernard J. Newman, Managing Director, Philadelphia Housing Association, Mrs. Alice Liveright, Secretary of Welfare, Commonwealth of Pennsylvania, Mrs. Gustav Ketterer and other prominent Philadelphia citizens. Thomas and Martin are the architects.

Neighborhood Association Project, St. Louis. This project will be built by a limited dividend corporation, composed of a responsible group of St. Louis citizens, and sponsored by the Neighborhood Association which already has control of the required land and is prepared to make an investment of \$100,000 in addition to the Government loan. The project covers a site 272' by 407' in a densely populated slum area in the north-central part of the city and a half mile from the center of the city. Three-story fireproof apartments, containing 252 apartments with a total of 641 rooms, in units of from two to four rooms are planned. If the loan is made at 4 per cent and 1.35 per cent amortization, the rents will average \$9.67 per room per month. Hoener, Baum & Froese are the architects.

Limited Dividend Corporation, Cleveland. A limited dividend corporation will be organized under the auspices of the Mayor's Business Recovery Commission to undertake a series of housing developments including certain portions of projects heretofore submitted by Cleveland Homes, Inc., Community Homes Company and the Forest City Housing Foundation. The sponsors of the proposed corporation have agreed to supply an equity of \$2,000,000 provided the Public Works Administration advances a loan of \$12,000,000, and ask that their equity in any less amount be matched in the same ratio. The three projects are to cost not more than \$14,000,000.

The first of the three projects is sponsored by Benedict Crowell, Newton D. Baker and others.

The second and third projects are sponsored by Joseph L. Weinberg, and Conrad & Teare. The areas within which these projects will be erected have been selected on the basis of data assembled by the City Plan Commission, the subcommittee on housing of the Mayor's Business Recovery Commission and Howard Whippe Green, consultant to the PWA Housing Division.

The housing to be constructed will rent at an average of between \$8 and \$8.50 per room per month. The projects provide for two- and three-story apartments, two-story fireproof row flats and row houses. The areas to be cleared are 33.7, 61 and 19.5 acres, respectively, near the center of the slum district of Cleveland as indicated by statistics on crime, vice, delinquency and death rate. Walter R. McCornack, J. L. Weinberg, Conrad & Teare and F. W. Striebinger are the associated architects.

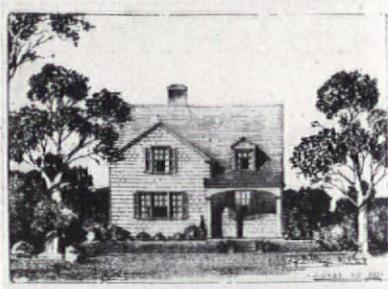
Roosevelt Terrace Housing Development, San Francisco. This project is to be built on a site of approximately 19.5 acres, near the easterly end of Golden Gate Park and located between it and the Presidio. Nearby are the University of San Francisco, San Francisco College for Women, and the St. Ignatius High School. The value of the site for low-cost housing is further enhanced by the recent acquisition of 5½ acres of this plot by the city for a park.

The Limited Dividend Corporation is headed by Henry E. Monroe and has on its Board of Directors, W. H. McCarthy, Postmaster, Alfred G. Swinerton, Atholl McBean, Edward H. Heller and other prominent citizens of San Francisco.

This project will provide approximately 886 apartments, totaling 3,048 rooms to rent at an average of \$11 per room, and will consist mainly of four-story walk-up apartment buildings grouped around a court which is dominated by a central six-story elevator building, all of fireproof construction. The land coverage is approximately 28 per cent of the site. Miller & Pflueger are the architects.

Two Atlanta, Georgia, Housing Projects. Techwood, Inc., a project for white occupancy, will cover a site of ten city blocks, two of which are to become city parks. It has unusual school and recreational facilities and will remove one of Atlanta's worst slums from a main thoroughfare connecting the business section and the Georgia School of Technology. Accommodations will be provided for 557 families in two- and three-story walk-up, fireproof apartments, containing 1,965 rooms. There also will be a dormitory of 160 rooms for students of Georgia Tech. The land coverage is approximately 25 per cent, exclusive of the land to be devoted to public parks. On the basis of 4 per cent interest on the loan and amortization at 1.51 per cent it is estimated the rental per room will be between \$7.50 and \$8 a month.

Citizens of Atlanta are furnishing an equity of \$375,000. The corporation is headed by C. F.



Typical house designs proposed for the Euclid Housing Corporation development in Euclid, Ohio, tentatively granted a loan of \$1,000,000, as reported in the October issue. George B. Mayer is the architect. Eight different types of houses will be submitted to lot owners for their choice, after which the non-profit corporation will undertake the construction according to requirements. More than 9,000 vacant lots on fully-improved streets in Euclid are held almost entirely under individual ownership; under the proposed aid from the Public Works Administration it will become possible for the lot owners to borrow money for the entire cost of house construction.

Palmer and includes on its board of trustees, the Mayor of Atlanta, Dr. M. L. Brittain, the president of Georgia Tech.; Clark Howell, Sr., former United States Senator John Cohn, a representative of labor, the president of the Chamber of Commerce, and others prominent in the city. Judge John S. Chandler is counsel for the trustees.

University Housing Corporation, a negro project, will occupy six city blocks now covered by slum dwellings. Existing buildings will be replaced by three-story, fireproof multiple dwellings with large public spaces. The site is adjacent to Spellman and Atlanta Universities (both Negro). The new housing will consist of 800 apartments of three and four rooms each. There will be 2,880 rooms, with an average rental per room per month between \$4.50 and \$5.

The board of trustees of the corporation includes prominent interracial leaders, among them, Dr. W. W. Alexander and Dr. John Hope. The citizens of Atlanta are furnishing an equity of \$187,500 in the project.

Burge & Stevens are the architects for both projects.

All housing allotments made so far are subject to modification in plans and to contracts satisfactory to the Public Works Administrator, insuring that the announced policies of the Administration will be carried out.

WEST VIRGINIA SUBSISTENCE HOMESTEADS DEVELOPMENT

An advance of funds to build homes for 200 unemployed miners and their families in Preston County, West Virginia, has been approved by the Public Works Administration. The tract comprises 1,100 acres. Each house will have 4 acres of land on which the tenant will grow vegetables and fruits, raise poultry and produce foodstuffs for home consumption. The development will include a school, which will serve as a community center, and a factory to produce equipment for the post office department.

The Public Works Administration has \$25 million for the subsistence farming program, which is intended to place families on small tracts of land,

to grow their own foodstuffs and to become economically independent through allied educational and industrial development. About \$8 million is to be used in building 23 villages of such families, with about 200 families in each, in mining areas in Pennsylvania, West Virginia and Western Kentucky. Each family will have from two to four acres and a small house costing about \$2,000 which will become their property under a 20-year purchase plan.

LEGAL COUNSEL NOT NECESSARY IN SECURING CONTRACTS

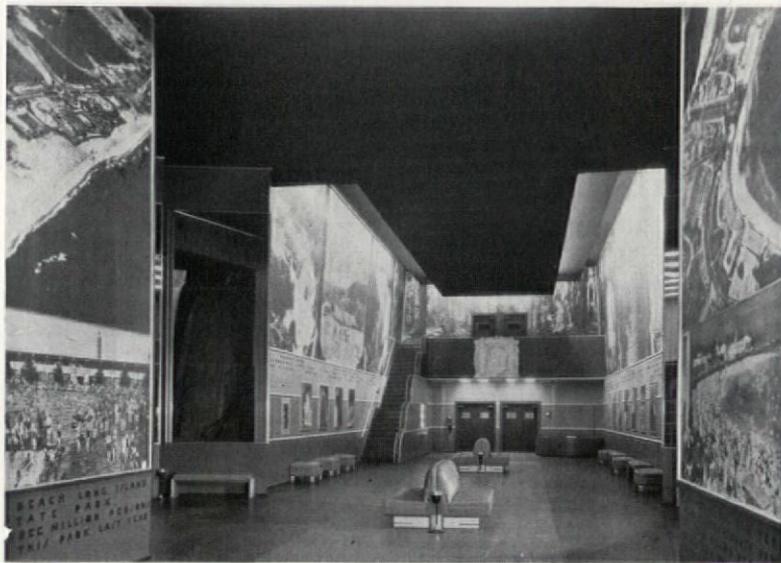
The Treasury Department will look with much disfavor on those architects or engineers who retain legal counsel in Washington to aid them in securing professional contracts from the Department; in fact, it will be the disposition of the Department to eliminate such architects and engineers from consideration altogether. This announcement was recently made by Assistant Secretary of the Treasury Robert who has requested the American Institute of Architects and American Engineering Council to make the attitude of his office widely known.

Early in the summer the Treasury Department learned that certain Washington lawyers had been soliciting engineers, architects, and others, interested in obtaining Government business, representing that to retain such counsel would enhance the opportunities of the engineers and architects to obtain desirable contracts. This activity has been particularly prevalent in western states.

The Treasury Department has not made the names of the lawyers who engaged in this practice public, feeling that probably they did not realize (1) that their proposal was in itself a reflection on certain Government officials; (2) that representation of the nature lawyers would provide could not possibly have any bearing upon the selections made by the Treasury Department.

The Department desires to make its selections on the merits of each case alone. There is no disposition on the part of the Department to prosecute any of the parties concerned, but it does want it emphatically understood that such a practice will be outlawed.

ILLUSTRATED NEWS



Kaufmann-Fabry

The New York State Exhibition at the Chicago World's Fair, designed by Eugene Schoen, architect, tells the story of the scenic beauties and recreational advantages of the Empire State by means of enormous photomurals by Edward Steichen. Adirondack scenes, George Washington Bridge, the State Educational Building, Jones Beach State Park, and the Westchester County Park Commission's "Playland" are featured in the photomurals. Panels in relief by Joseph Urban.



Kaufmann-Fabry

A section of the Adirondacks has been reproduced on the Chicago lake front at the Century of Progress Exposition as part of the New York State exhibition. Gilmore D. Clarke, landscape architect for the Westchester County Park Commission, had charge of this forest setting, which includes a typical camping site. Native trees, flowers and fish were brought from the Adirondacks.

ENGINEERS SPONSOR HOUSING CONFERENCE

A National Conference on Low-Cost Housing was held October 25-27 by the Cleveland Engineering Society in cooperation with other interested organizations.

Whereas the National Conference on Slum Clearance held in Cleveland last July dealt chiefly with business factors, this latest conference was intended to give engineers, architects, manufacturers and others an opportunity to exchange views on their related problems of a more technical nature. The entire proceedings of the conference, according to plans, will be printed as a practical handbook on low-cost housing and as a guide to future development in materials, services and other technical factors involved in housing.

DUST TO FIGHT FIRES PERFECTED BY SEATTLE ENGINEER

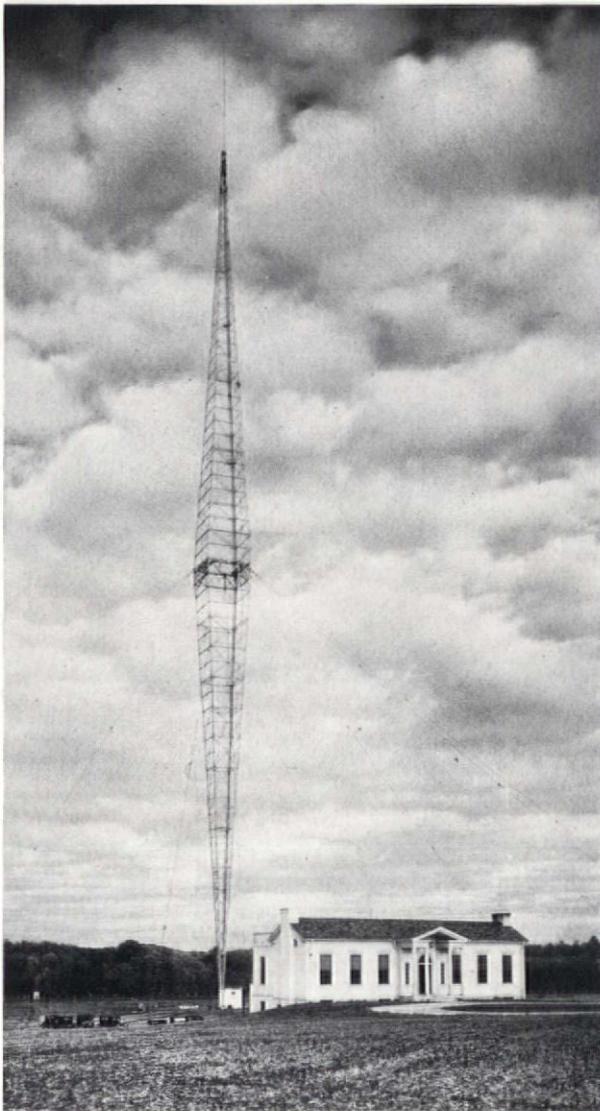
Prof. Frederick K. Kirsten, aeronautical engineer at the University of Washington, has invented a device by which a fire-fighting dust may be played on a fire in an aerated mass through a hose and nozzle. The dust smothers the fire by developing a large quantity of carbon dioxide gas under heat.

In a test directed by the Seattle Fire Department, the dust extinguished in three seconds a roaring blaze in a garage filled with oily rags, crumpled newspapers, cedar shingles, oil and gasoline. The dust does not absorb water, Prof. Kirsten explained. It looks like coarse flour and flows like water under treatment. A pressure of 200 pounds can be put behind it.



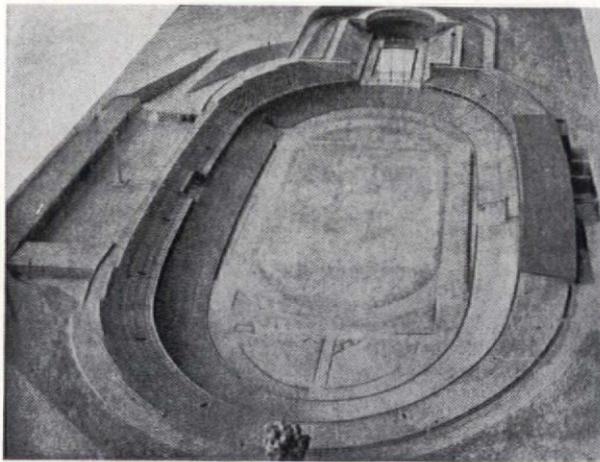
Acme

The underground garage which supports a park plaza in Washington, D. C., is for the use of members of Congress. It covers an area of approximately two square blocks and was built at a cost of \$817,000. Parking space in the garage is reserved for each of the 96 Senators, whether he has a car or not, and a sign bearing his name is over each space. The total capacity is set at 361 cars.



Commercial Photograph Co.

The 878-foot tower of Station WSM, the broadcasting service of the National Life and Accident Insurance Company in Nashville, Tennessee.



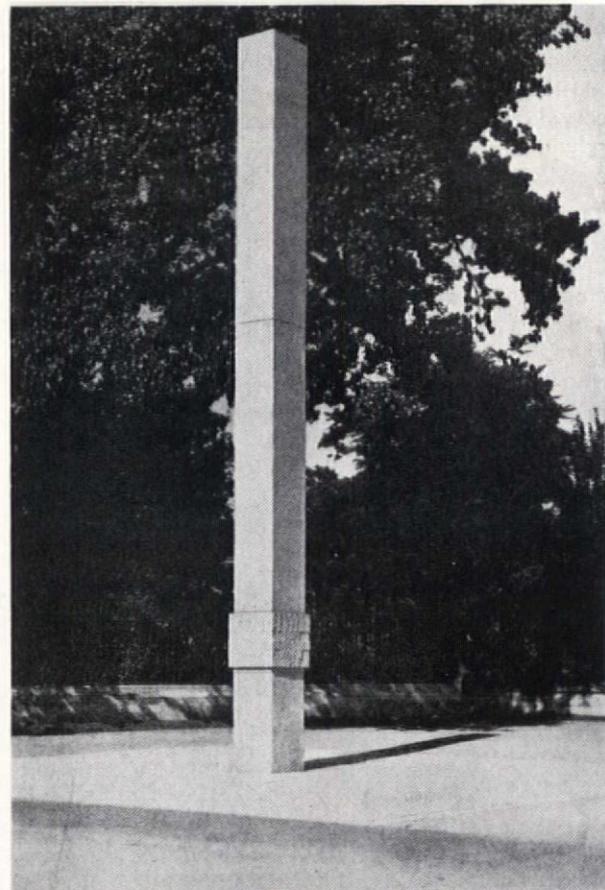
From THE ARCHITECT & BUILDING NEWS

Model of the Berlin Stadium for the 1936 Olympic Games which is planned to seat 87,000 persons. On the left are the dressing rooms, on the right the covered stands. At the rear is a swimming stadium.



Keystone

The new Bronx County Courthouse on Grand Concourse, New York City. The associated architects are Max Hausle and Joseph H. Frelander, both of New York City.



From THE ARCHITECTS' JOURNAL

A simple gray granite stele stands in one of the public squares of Vienna as a memorial to Otto Wagner (1841-1918), architect of the Post Office Savings-Bank Headquarters, the Steinhof Asylum, a block of flats in the Neustiftgasse, the pressed-steel stations of the Stadtbahn, and other well-known Viennese buildings erected in the last decade of the nineteenth century. The memorial was designed by Joseph Hoffmann, first his pupil and then a partner.

CHARLES A. PLATT

An Appreciation

Perhaps the truest indictment of American architects today is the lack of compelling, personal conviction about our art. The eclecticism which has contributed so many distinguished buildings to our architecture has unwittingly developed such adroit handling of architectural styles, from ancient to the most modern, that imitation has too often passed for inspiration.

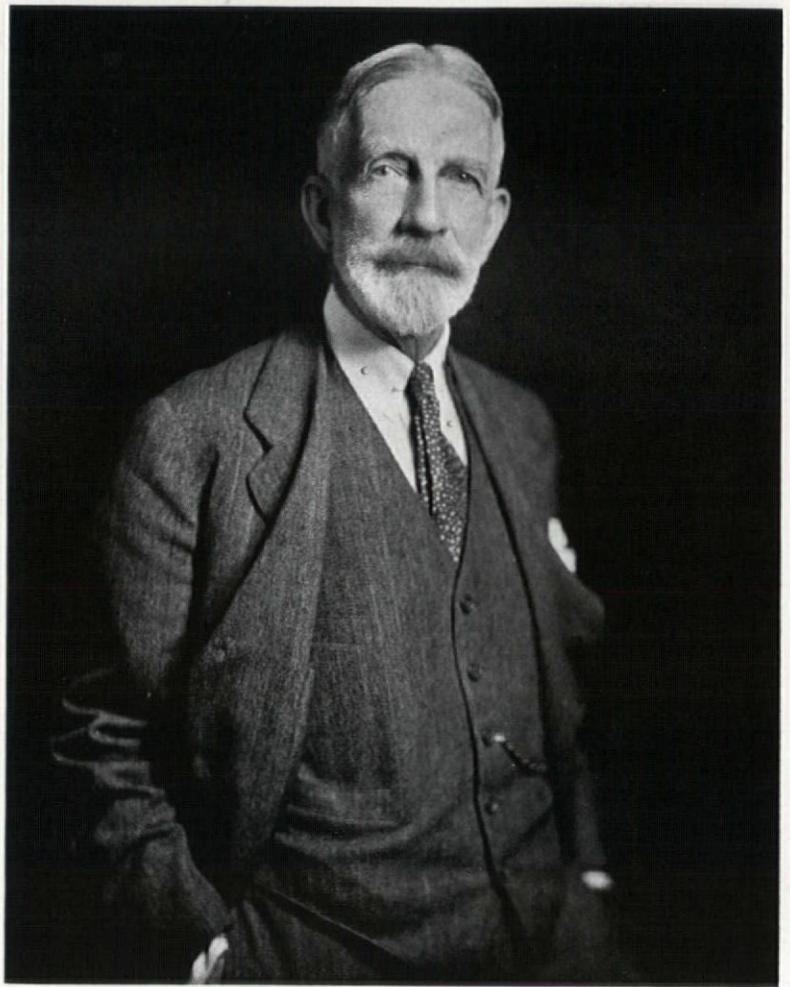
In welcome contrast to this unconscious insincerity stands conspicuous the true artist, fired with conviction and endowed with the ability to express it with strength and beauty.

Such a man was Charles A. Platt. He signed his buildings with a firm and legible hand which left no doubt as to their authenticity or the convictions of the designer. He could not compromise with popular taste because he could not compromise with himself.

His preparation for architecture was the training of an artist, distinguished first as an etcher and landscape painter. His work and studies in landscape architecture completed an artistic background which gave to all his work the stamp of an artist. Composition, form and color he knew as fundamental to all art. Principles, not "periods," were the foundations of his architecture.

In the largest sense he was not concerned with the difference between ancient and modern architecture, or the conventions of styles. To his penetrating judgment and sensitive taste there were but two "styles" in architecture—good architecture and bad architecture. Guided by this fundamental conception, he drew upon tradition with a reverent but discriminating independence, and vitalized it with fresh invention. Tradition was not a copy book but a gospel in which the artists of the past set down their challenge to the future.

The thoughtful study which always distinguished his work was the study of the creative scholar, not the pedant. The logic of his planning, the directness and gracious simplicity of his design reveal the clarity of his intellect. Mere novelty never



Blackstone Studios

masqueraded as originality in the patrician distinction of his buildings.

During these years of transition in public taste, with all the allurements of new forms and materials, he has been unswerving in his devotion to beauty as he felt it and his artistic integrity remained untarnished.

The heritage which he has left behind him is threefold.

As an artist, talented in so many fields, he held steadfast to the things of the spirit, and the refinement and restraint of his compositions are the noble expressions of that devotion.

As a colleague, he upheld the highest traditions in the practice of architecture; unstinting in his services to its educational interests, generous in his wise counsel, magnanimous in his relations with other architects; he has kept the faith.

Those who knew the privilege of his friendship will cherish him most lovingly as a man. As Eugene Speicher wrote of George Bellows, "Above all he had a heart and used it at all times." The kindness of that heart, the twinkle of his humor, the goodness that was in him, these are the things that remain in affectionate remembrance of this man, so richly endowed with the gentle simplicity of greatness.

S. MERRELL CLEMENT.

OBJECTIVES OF ARCHITECTURAL EDUCATION

By RAMSAY TRAQUAIR, Professor of Architecture, McGill University in Montreal

The architect is an artist who uses structure as his material. As the musician uses sound or as the painter uses canvas and color, so the architect uses the construction and the materials of building. But very few buildings are made only to be looked at; the architect must also satisfy practical requirements. This must not be thought of as a limitation to his art, but as an opportunity. Indeed these practical needs—construction, material and use—are the foundations of his art and without them he would be designing in a void.

There is therefore no such thing as a "pure" or abstract architecture of form and proportion and we have to beware of that curious conception which regards a building as a work of pure form, trammelled and limited by the unfortunate necessities of use and material. Form and proportion are in fact largely ruled by material; the plan of a Roman Bath is a brick and concrete plan designed to carry vaults and is very different from that of a modern skyscraper, built of steel and terra cotta and constructed with lintels. These plans are different not merely in detail or in use; they are fundamentally as different as, for instance, an oil painting is different from a mosaic dome.

So again the proportion of a Greek Doric building is a stone proportion. It is quite different from the steel proportions used in modern office construction. Nothing but blundering can come from the attempt to impose the one upon the other.

To a real architect nothing could be less interesting than a building on a level site, composed of no particular materials and designed for only ideal requirements. Every real work of architecture is based on practical needs, placed upon an actual site and composed of real materials. Its very life depends upon these things, they are the designers' opportunities. The architect is the artist of practical needs.

Like everything else art grows from the past. Man is distinguished from the beasts by his power of accumulating knowledge and of adding to it. This is tradition. We cannot do without it and we must not be slaves to it. It is part of the artist's material, even the revolt against tradition is a well-known traditional attitude.

So we find certain large subjects upon which architecture is founded and in which the aspirant must be trained. They are first, construction and materials; second, practical needs; third, tradition or history, and finally, the combination of these subjects into the design of buildings. Here we will include such "pure" subjects as proportion, symmetry, rhythm, and the use of axes, but always as properties of real buildings.

To these may be added some knowledge of the manner in which an architect conducts his busi-

ness, his legal rights and obligations and his professional ethics. This is of course not fine art but civics; it should form part of any full course of training.

Now to carry out this very full program we have a quite limited time, for it is very important that the young man should go out into the world while his mind is still flexible and his ideas still capable of change. Most people lose their youthful elasticity of mind before the age of thirty. After that age few can learn anything new; they can increase and improve their knowledge but their ideas are fixed.

This means that the period of formal tuition must be finished by the twenty-fifth year. The tendency to lengthen the university course is very strong; we are asked to add a master's degree and no doubt in time the ubiquitous doctorate will appear. To these tendencies one answer must always be given. The university course is a training in certain fundamental subjects. It is not intended to be immediately practical and it cannot include everything. The young man must stand on his own feet as soon as he can. Tuition is bad for most men after their twenty-fifth year; it would be better for them to leave collage at twenty-three.

This is not the place in which to discuss fully the evils of cosmopolitan art and the need for "localism." It is sufficient to state the conviction that all good art is local and that a "world art," a cosmopolitan art, is simply a bad art, pithless and flavorless. To repeat, architecture is the art of erecting buildings out of real materials for real conditions of life in a real place with a climate. What is suited to southern England will not do for eastern Canada. What is suited to Canada will not do for Paris or New York; it will be found by investigating Canada patiently and not by studying overmuch in Rome. A Loire Chateau on the banks of the Hudson is an insult to two great rivers and the beauties of both English and French Gothic cannot be combined in one church in New York. These are the absurd fruits of cosmopolitan architecture.

Finally we must not forget that a university is a place of education rather than of instruction. The final purpose of education is to enable the student to enjoy life by multiplying his interests, for the educated man is the man who is mentally curious and active, to whom life is full of interesting things. I believe that this real education can be more fully attained by a close contact with reality than by any abstract or scholastic studies. The architect must be restored to his position of master builder, otherwise he will sink to be a mere draftsman to the real builder, the man who constructs.

TIME ZONING AS A PREVENTIVE OF BLIGHTED AREAS

By K. LONBERG-HOLM

The functions and growth of a city are conditioned by the nature of the control machinery with which private enterprise is limited and correlated. The existence of urban blight indicates failure to cope with changing conditions. The following comments diagnose blight as a factor of growth and evaluate relative efficacies of zoning measures as blight preventives. Space-time zoning is proposed as more effective than the present space zoning.

Blighted areas represent accumulated obsolete equipment. The immediate causes of obsolescence, defined as the exhaustion of the usefulness of equipment, are found in one or in a combination of several of the following interrelated groups of factors:

(1) Improvements in design, layout, structural and mechanical equipment and service facilities, and crowding by adjacent structures which causes obsolescence relative to intended use.

(2) Increasing mobility of population and production activities expressed in decentralization and shifting of functional areas which cause obsolescence relative to location.

(3) Socio-economic changes which affect domestic, productive, occupational, recreational and educational relations and render obsolete the specific function for which a particular structure has been manufactured.

(4) Physical deterioration caused by wear and tear of mechanical and structural parts. Rates of forms of obsolescence listed above are usually higher than rates of physical deterioration. Application of science has lowered the useful life span of layout and mechanical equipment through rapid introduction of new improved equipment and control technique, and simultaneously increased the potential physical life of structural equipment through introduction of more permanent materials.

Obsolescence may be temporarily neutralized or retarded through modernization. Usually obsolescence causes changes in occupancy to an economically less desirable form (such as change from residence to rooming house) or remodeling for a new purpose. Both procedures imply exploitation of social inequities. Condemnation and demolition for reasons of physical safety are resorted to only as the last way out.

Blighted areas are frequently results of long-term inflexible planning. This causal relation is important to note because long-term city and housing planning measures have been proposed as instruments of recovery. Slum clearance at the cost of new potential slums is only a palliative. Some planned model communities are on the verge of bankruptcy and hence are potential slums. Most

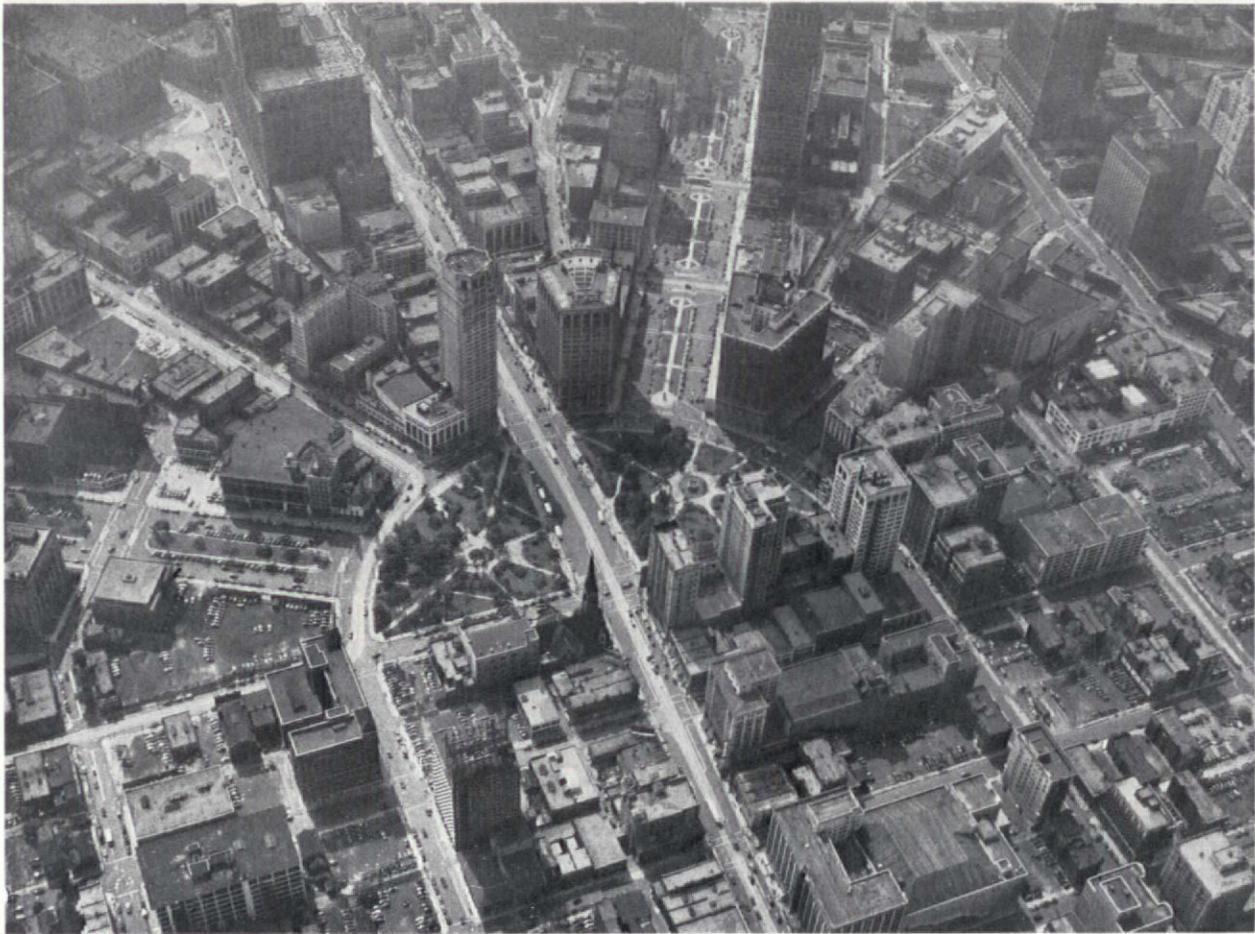
American cities are results of long-term planning, that is, opportunistic planning for continuous centralized expansion which has produced blight and piled up debts to the point of municipal bankruptcy. Planning must be analyzed relative to its constituents: purpose and program. Static long-term planning may merely perpetuate and magnify existing chaotic conditions, especially planning undertaken for business or political reason, e.g., as an employment measure.

Change and obsolescence are inherent factors of industrial progression. Obsolescence, with the possible exception of that caused by crowding and physical deterioration, is an index of human progress. The problem is therefore not to find ways of reducing or avoiding potential obsolescence (staticizing rate of change) but to harmonize the growth process through effective liquidation of obsolete conditions by moving or scrapping obsolete equipment.

Most industrial products are today manufactured for useful life spans much shorter and costing less than those which only recently were considered essential and economical. But immovable human shelters and cities are manufactured for a physical life far beyond their socially useful life on the original site, in spite of the obvious impossibility for any planner to predict technological progress and socio-economic changes and to define future needs. The procedure imposes heavy liabilities on future users and creates expensive obstructions to growth.

The immediate objective of urban control in an industrial society must be to provide conditions which will promote mobility through optimum use of new instruments. (Short time flexible planning of direction to promote the highest possible rate of technological advance consistent with social economy.) The potential uses of existing transport instruments have to date been consistently obstructed by obsolete pre-industrial city planning which proposes to land-tie population and productive functions.

This article appeared originally in the June 24, 1933, issue of *Real Estate Record and Builders' Guide*; it is reprinted by permission.



Fairchild Aerial Surveys

Air view of downtown Detroit showing numerous sites where obsolete structures have been razed and the areas now provide an income through their use as parking space.

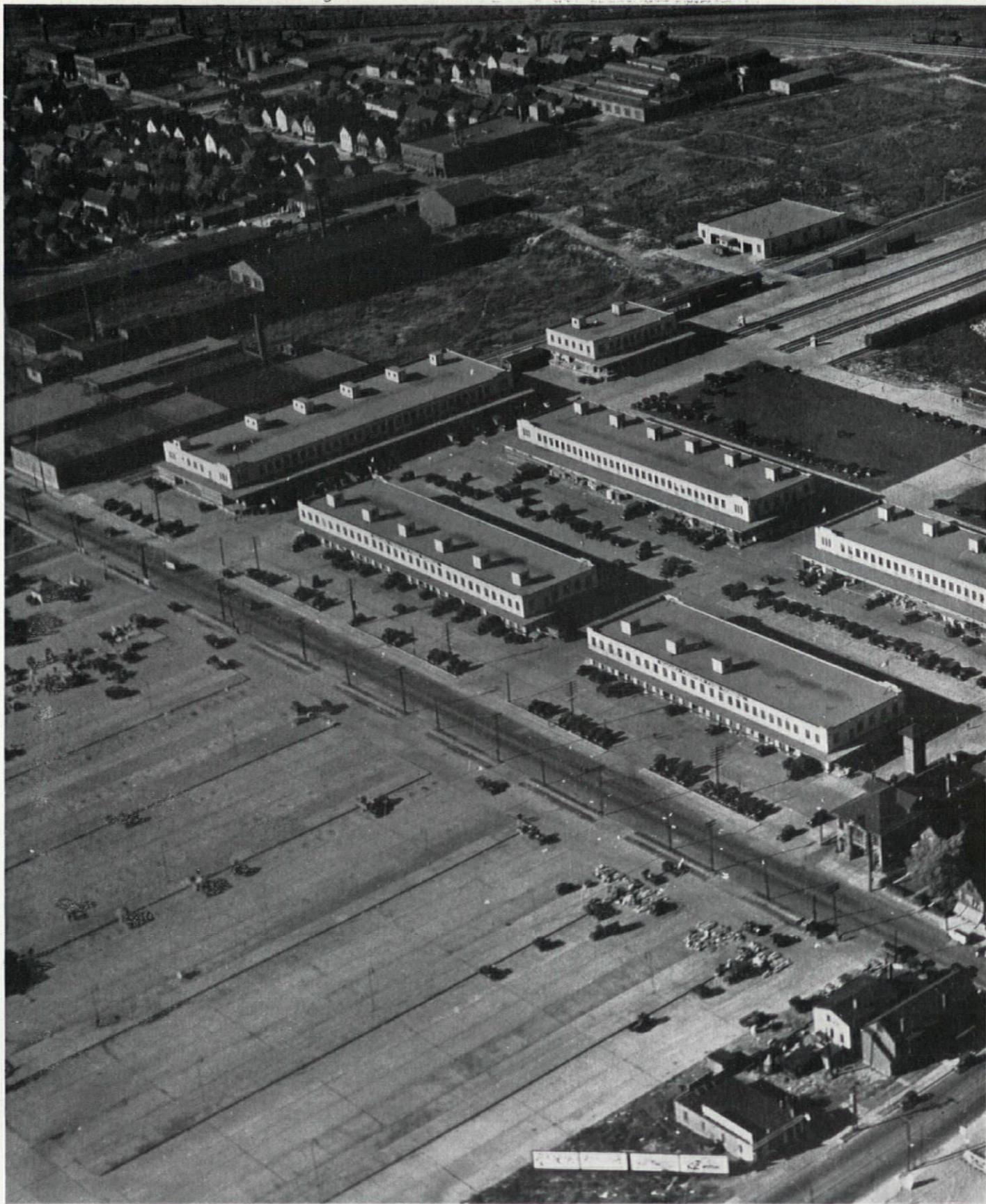
Existing control devices: zoning and building codes, can be used only to deal with the less important forms of obsolescence caused by crowding and physical deterioration, and have been instrumental in accumulating the economically more important forms of obsolescence. Present zoning which deals with geographic distribution of structures manufactured for definite use purposes, and height, bulk and land coverage of these structures, may be termed space or space-use zoning. It has not been able to prevent slums.

Effective zoning implies means of dealing with time factors and may be termed time or time-use zoning intended to control life spans of structures manufactured for definite use purposes. The combination of space and time zoning may be termed space-time-use zoning intended to control geographic distribution and life spans of structures manufactured for definite use purposes. The socio-economic desirable life spans—as opposed to life spans determined by potential private profit—would at present probably be found in most cases to be less than ten years, and would vary according to flexible time-use zones based on latest findings of socio-economic trends.

Time zoning would involve a license provision for the parking of any form of shelter for a given time on a given site, with the obligation for the erector-owner to remove the unit and clear the site when the license expired. The license could be renewable until occupancy became a public nuisance or liability. The licensee should be required to post bond with the city to insure compliance with the terms of the license.

One consequence of time zoning would be the speeding up of the industrialization of the building industry through the demand for flexible, light, mobile shelter units manufactured for and amortizable over a short pre-determined life span. Shelters not only easily manufactured, assembled, operated and maintained, but equally important; easily moved, taken apart and set up elsewhere, modernized, or scrapped according to the form of obsolescence involved. Mobility and physical salvage value would be at a premium. The present waste in building construction expressed in idle deadload would carry its own penalty.

The consequences of time zoning on real estate, municipal finance and building codes are outside the scope of this article.



NIAGARA FRONTIER FOOD TERMINAL
BUFFALO, NEW YORK



GEORGE S. RIDER COMPANY, ARCHITECTS AND ENGINEERS
HUDSON AND HUDSON, ASSOCIATE ARCHITECTS

NIAGARA FRONTIER FOOD TERMINAL IN BUFFALO, NEW YORK

GEORGE S. RIDER COMPANY, ARCHITECTS AND ENGINEERS
HUDSON AND HUDSON, ASSOCIATE ARCHITECTS

This new Terminal—a 60-acre development of buildings and facilities for the economical, efficient and clean marketing of food products in the heart of one of America's largest farm produce and food distributing centers—is one of the largest and most complete of its kind in the United States. There are thirteen fireproof buildings, with a total floor area of 1,000,000 square feet. Each building faces front and rear on wide concrete paved streets.

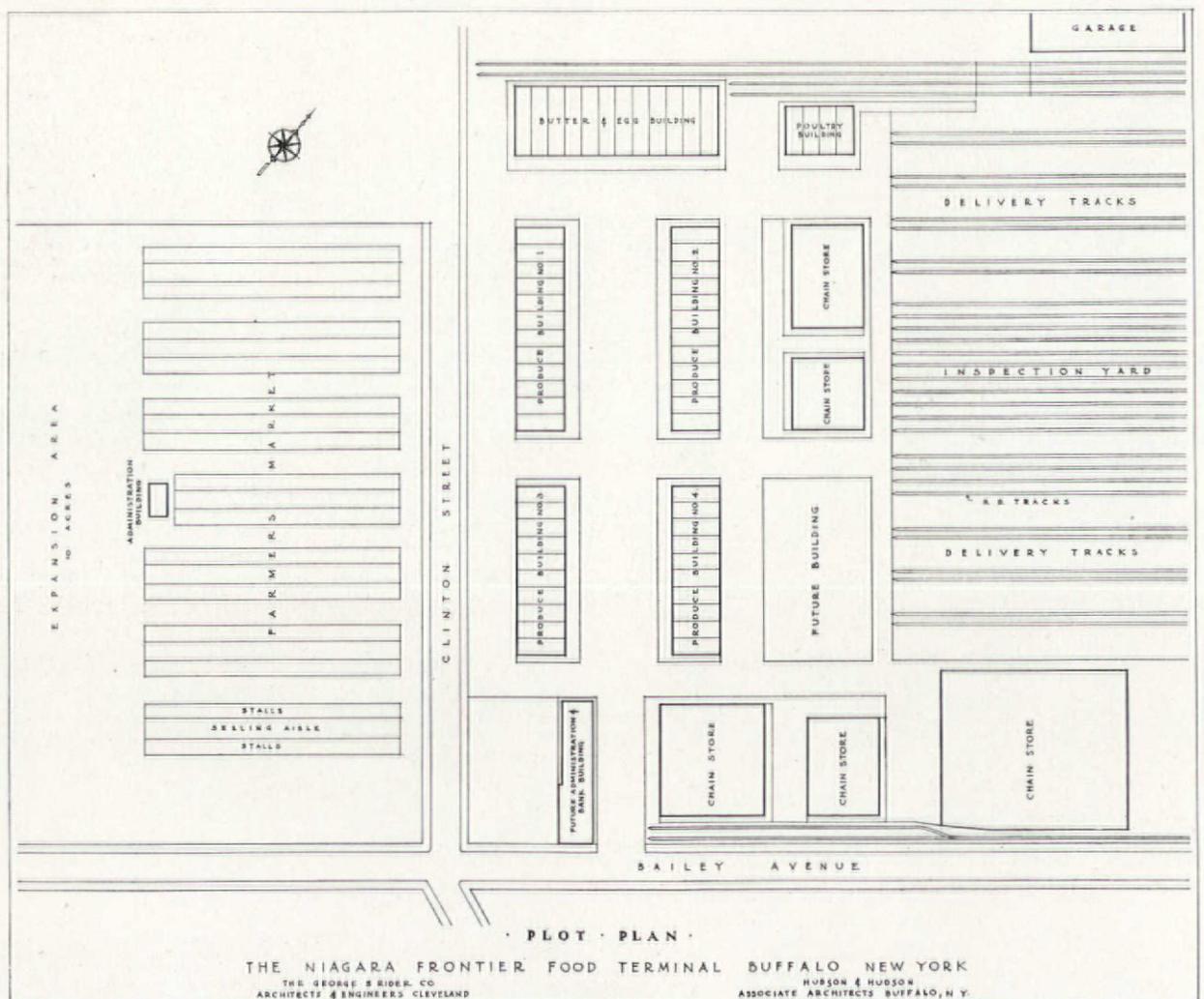
The commission merchant, the grower and the distributor of fruits, dairy products, fresh vegetables and poultry are brought together in a great "food city." Team track delivery yards with wide driveways, ample loading platforms, facilities for icing, conveniently arranged sales rooms and offices make the terminal complete in every detail.

For the farmer and market producer of the Niagara Frontier district a large complete farm market is an important facility of the new terminal. The location of the market—Clinton Street and

Bailey Avenue—is in a section of Buffalo that is ideal for the handling of food products. It is high, free from smoke and dust, has an efficient drainage system and is served by rail lines and paved highways reaching in every direction.

Each of the thirteen buildings is a complete market in itself. In these buildings the various branches of the food industry are grouped for the convenience of the seller and the buyer. For each of these branches have been provided all the facilities for display, ventilation or refrigeration that the particular food product requires.

Divided into stores measuring 24 by 100 feet, each unit faces on two of the wide streets with sheltered, truck-level loading platforms. Each unit includes basement space for storage and second-floor space for offices or sales rooms. The spacing of the buildings insures a maximum of lighting and air and a freedom from congestion in delivery and transfer facilities.



· PLOT PLAN ·

THE NIAGARA FRONTIER FOOD TERMINAL BUFFALO NEW YORK
THE GEORGE S. RIDER CO. ARCHITECTS & ENGINEERS CLEVELAND
HUDSON & HUDSON ASSOCIATE ARCHITECTS BUFFALO, N. Y.



Wm. M. Clarke

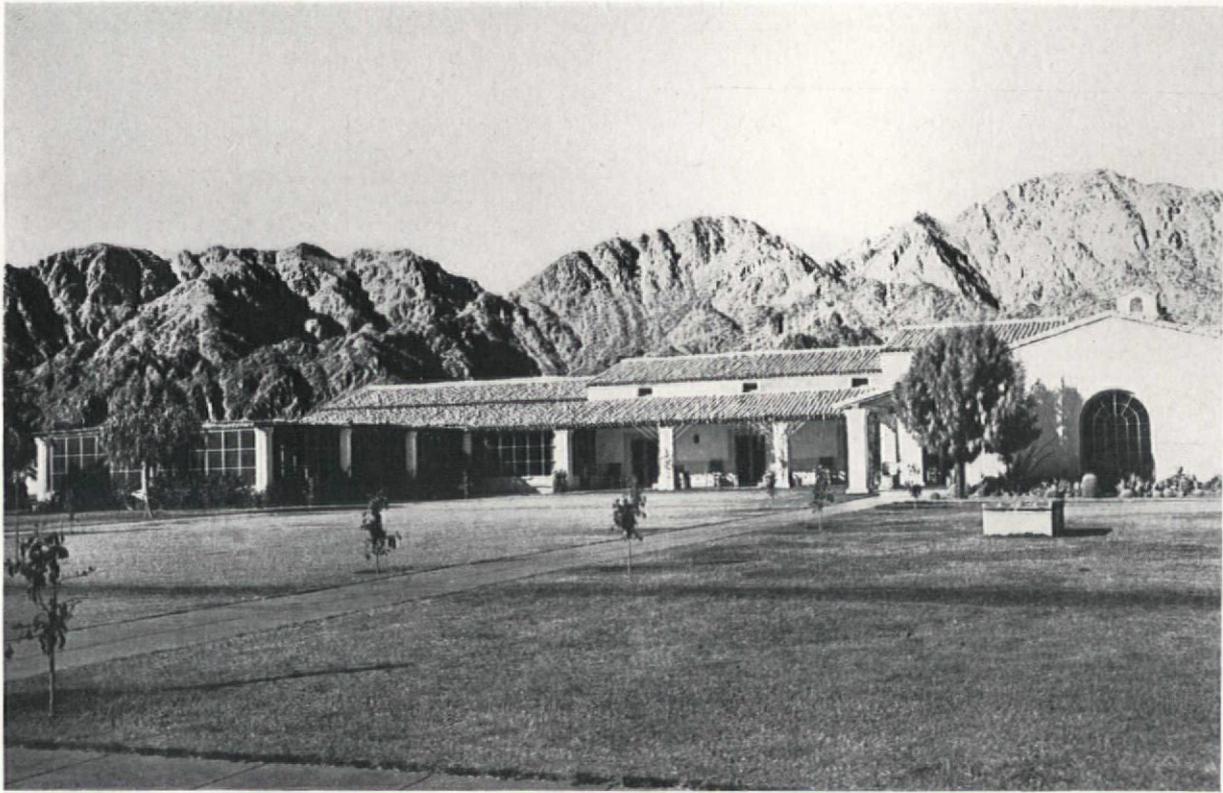
LA QUINTA HOTEL AND COTTAGES AT INDIO, CALIFORNIA
GORDON B. KAUFMANN, ARCHITECT

PORTFOLIO of LOW-COST HOUSES



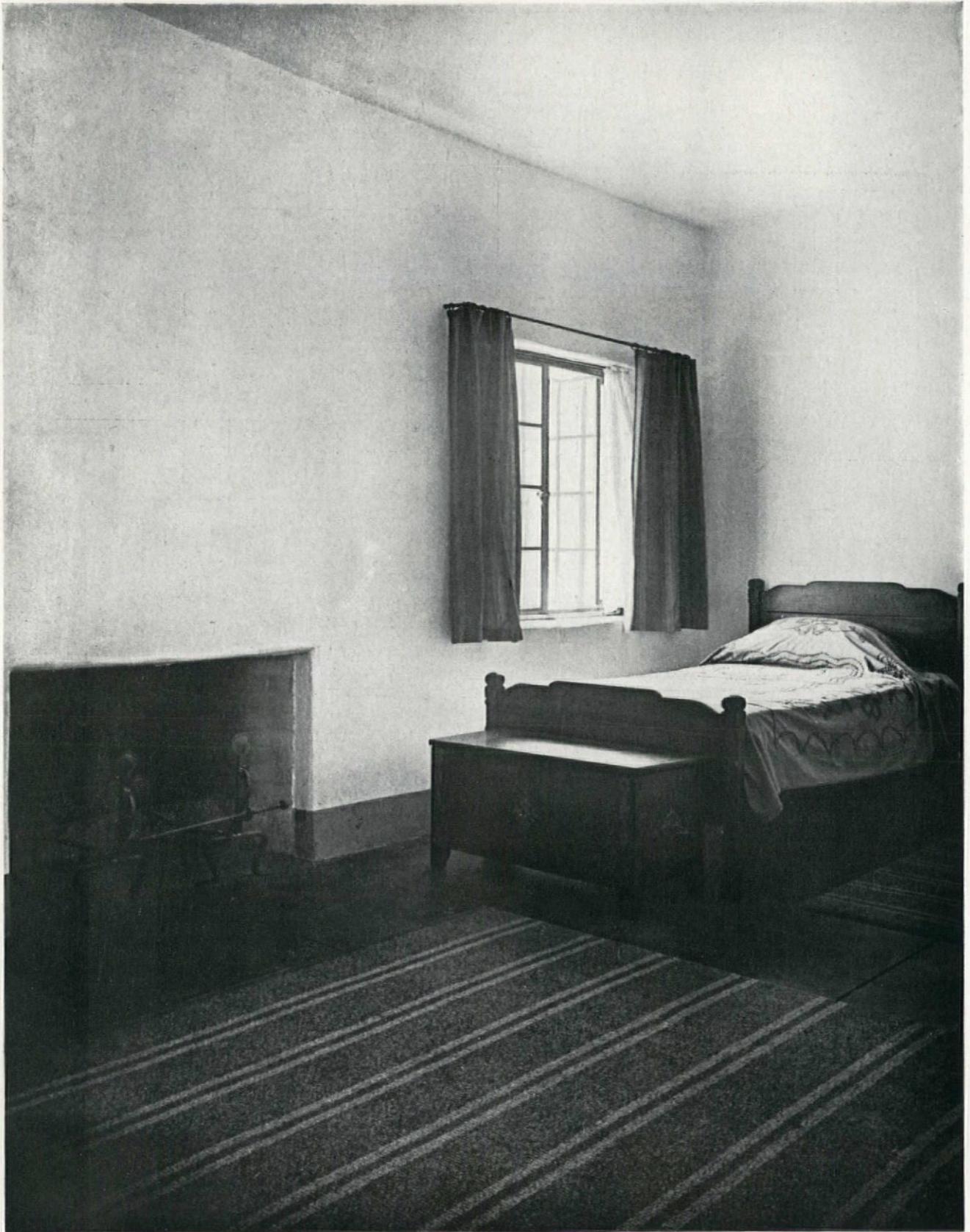
Wm. M. Clarke

LA QUINTA HOTEL AND COTTAGES AT INDIO, CALIFORNIA
GORDON B. KAUFMANN, ARCHITECT



Wm. M. Clarke

LA QUINTA HOTEL AND COTTAGES AT INDIO, CALIFORNIA
GORDON B. KAUFMANN, ARCHITECT



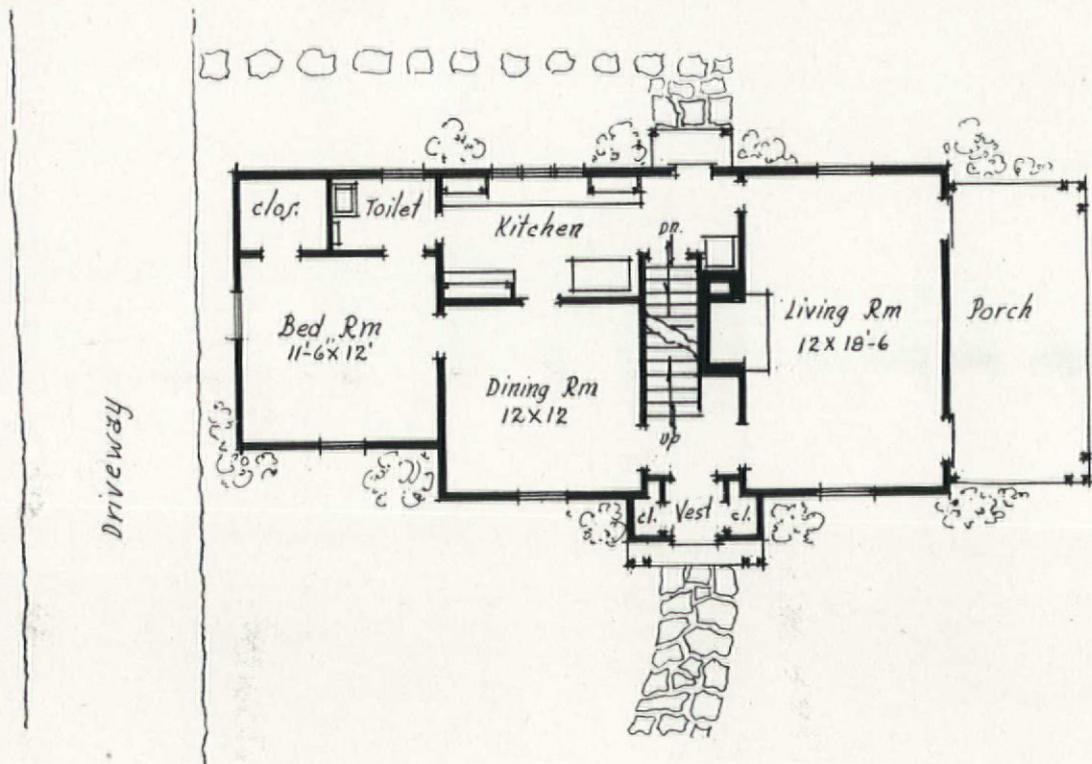
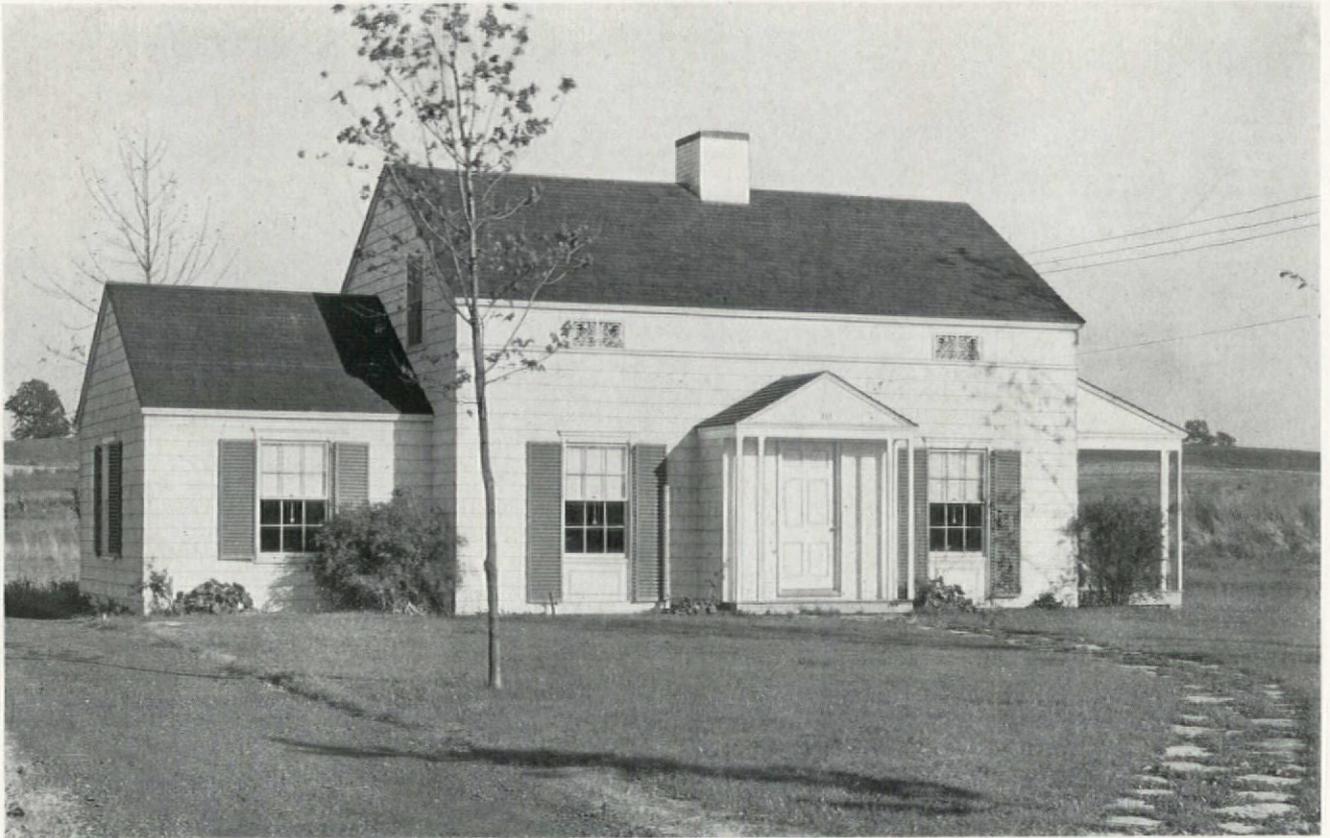
Wm. M. Clarke

LA QUINTA HOTEL AND COTTAGES AT INDIO, CALIFORNIA
GORDON B. KAUFMANN, ARCHITECT



Wm. M. Clarke

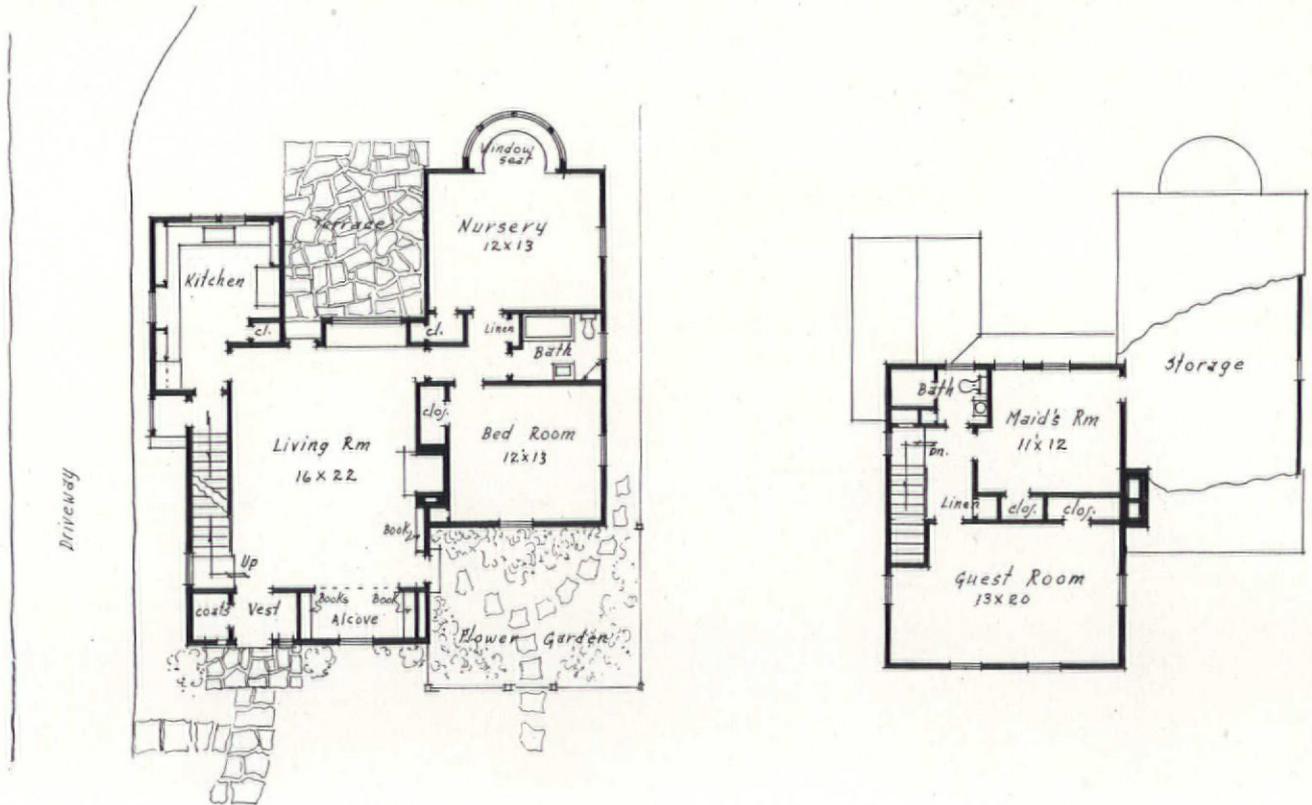
LA QUINTA HOTEL AND COTTAGES AT INDIO, CALIFORNIA
GORDON B. KAUFMANN, ARCHITECT



HOUSE OF MISS MARION PARSONS AT SYRACUSE, NEW YORK—CHARLES H. UMBRECHT, ARCHITECT



Smith, Lindsley & Arnold



HOUSE OF RICHARD D. GREENE AT SYRACUSE, NEW YORK—CHARLES H. UMBRECHT, ARCHITECT



F. S. Lincoln

Entrance hallway: white walls and ceiling; geranium red doors; carpet of geranium red, blue, black and yellow; table covering of green Fabricoid. The two doors lead to retiring rooms for guests.

APARTMENT OF KATHARINE BRUSH IN NEW YORK
JOSEPH URBAN, ARCHITECT—IRVIN L. SCOTT, ASSOCIATE



F. S. Lincoln

Men's retiring room: wainscot, floor and dressing table of cork.

APARTMENT OF KATHARINE BRUSH IN NEW YORK
JOSEPH URBAN, ARCHITECT—IRVIN L. SCOTT, ASSOCIATE



F. S. Lincoln

Bedroom: white ceiling with yellow and silver decoration; silver wall paper; white blinds; German silver trim on doors; silver gray chenille rug and yellow taffeta upholstery.

APARTMENT OF KATHARINE BRUSH IN NEW YORK
JOSEPH URBAN, ARCHITECT—IRVIN L. SCOTT, ASSOCIATE



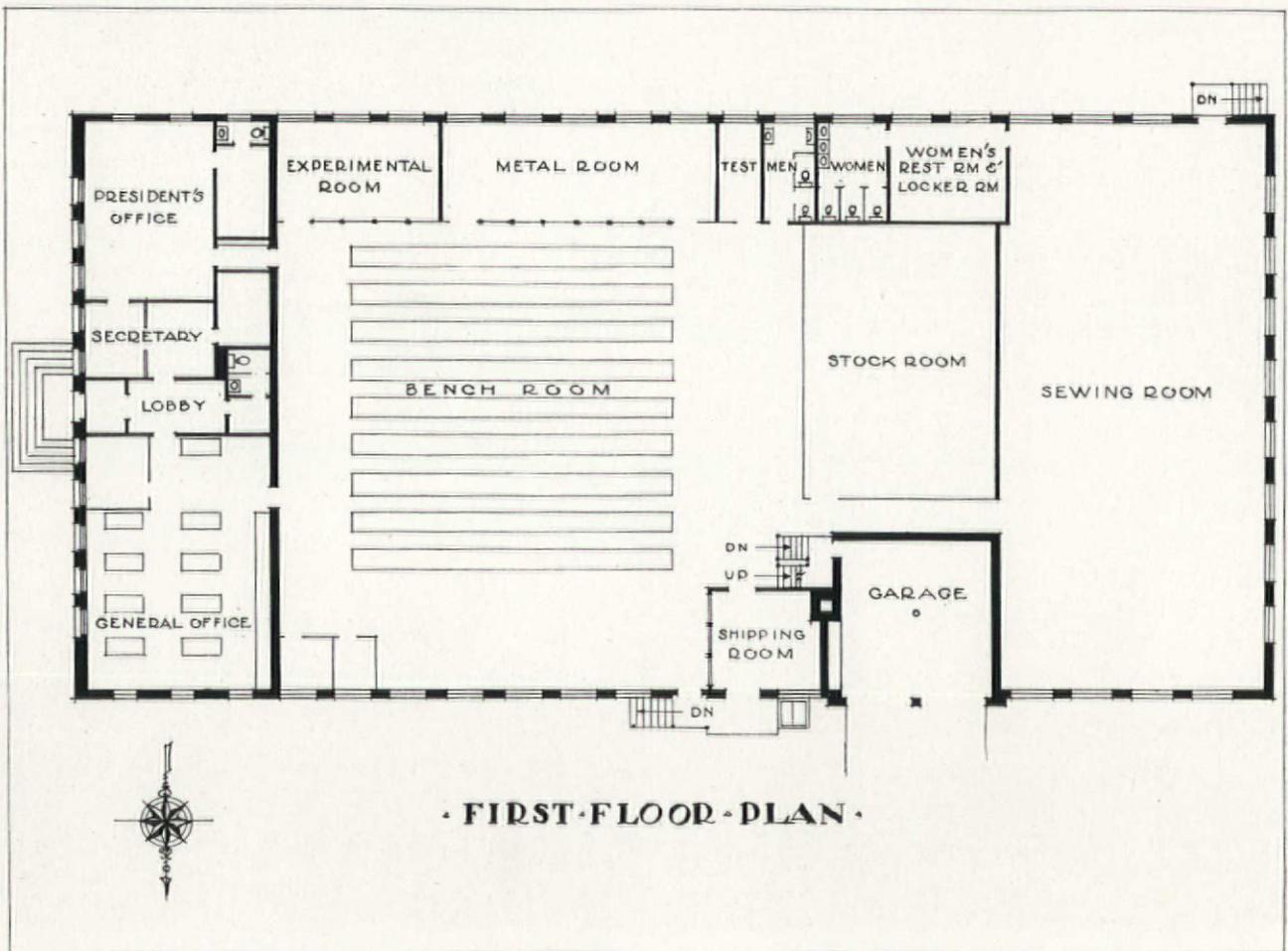
F. S. Lincoln

Studio: walls of California redwood burl with German silver moldings; Fabricoid wainscot; yellow marble fireplace; carpet with yellow center and black border.

APARTMENT OF KATHARINE BRUSH IN NEW YORK
JOSEPH URBAN, ARCHITECT—IRVIN L. SCOTT, ASSOCIATE



George A. Ostertag



IRVING AIR CHUTE COMPANY
 BUFFALO, NEW YORK
 HUDSON AND HUDSON, ARCHITECTS

Main office and factory for manufacture of parachutes. Building measures 82' x 166'. Walls are light buff and cream face brick with Indiana limestone trimming.



George H. Van Anda

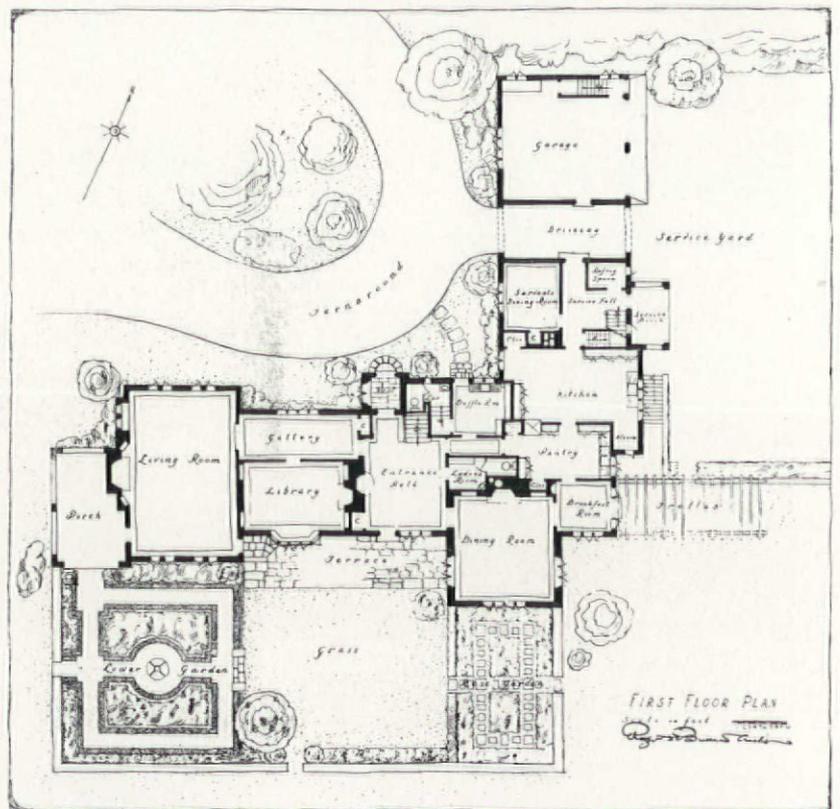
HOUSE OF WILLIAM EVERDELL, MANHASSET, LONG ISLAND — ROGER H. BULLARD, ARCHITECT

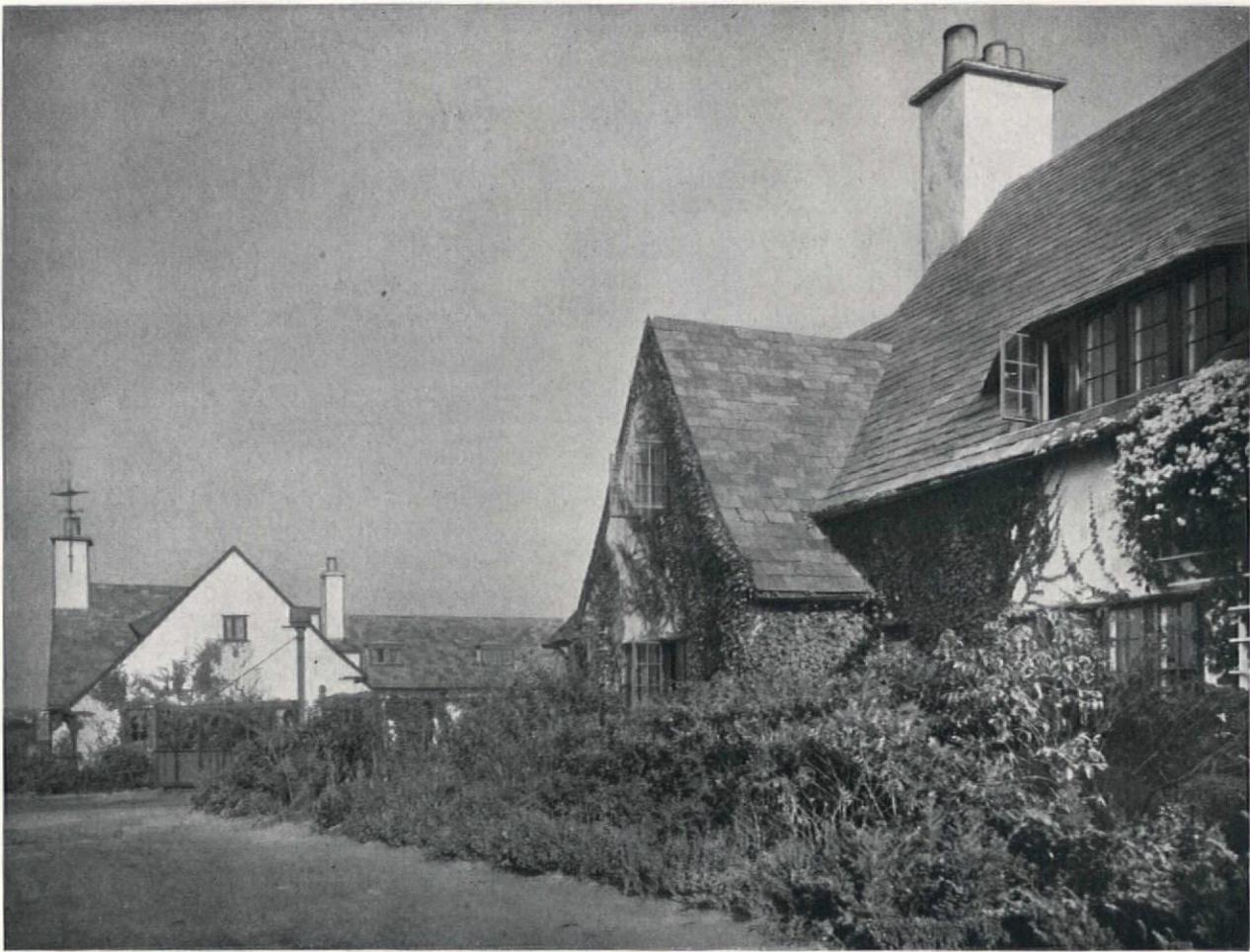


George H. Van Ande

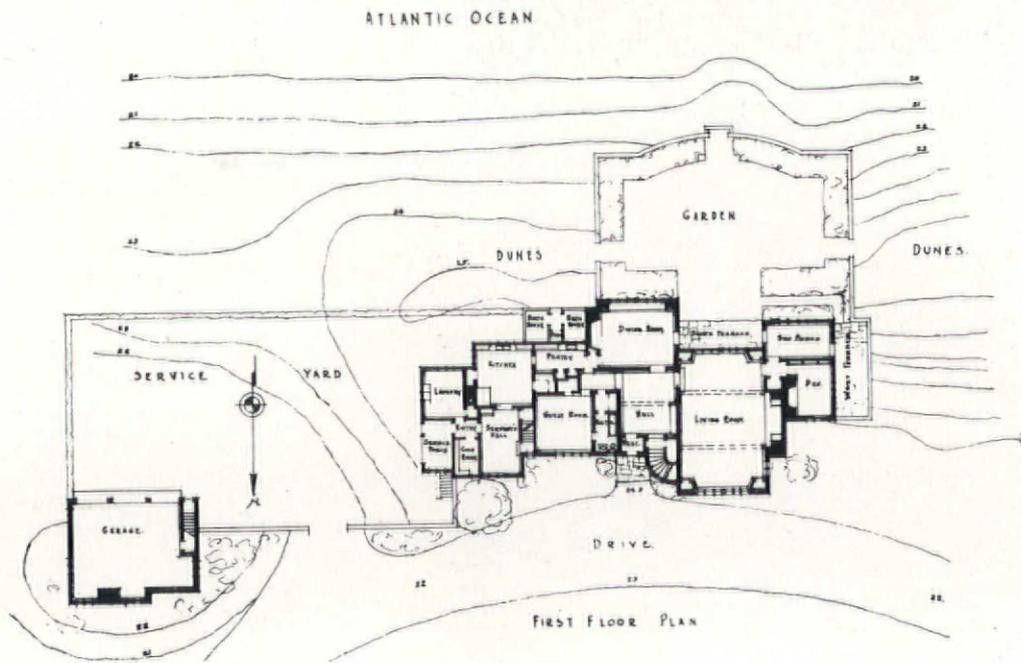
HOUSE OF WILLIAM EVERDELL
 MANHASSET, LONG ISLAND
 SHELTER ROCK ROAD

ROGER A. BULLARD
 ARCHITECT

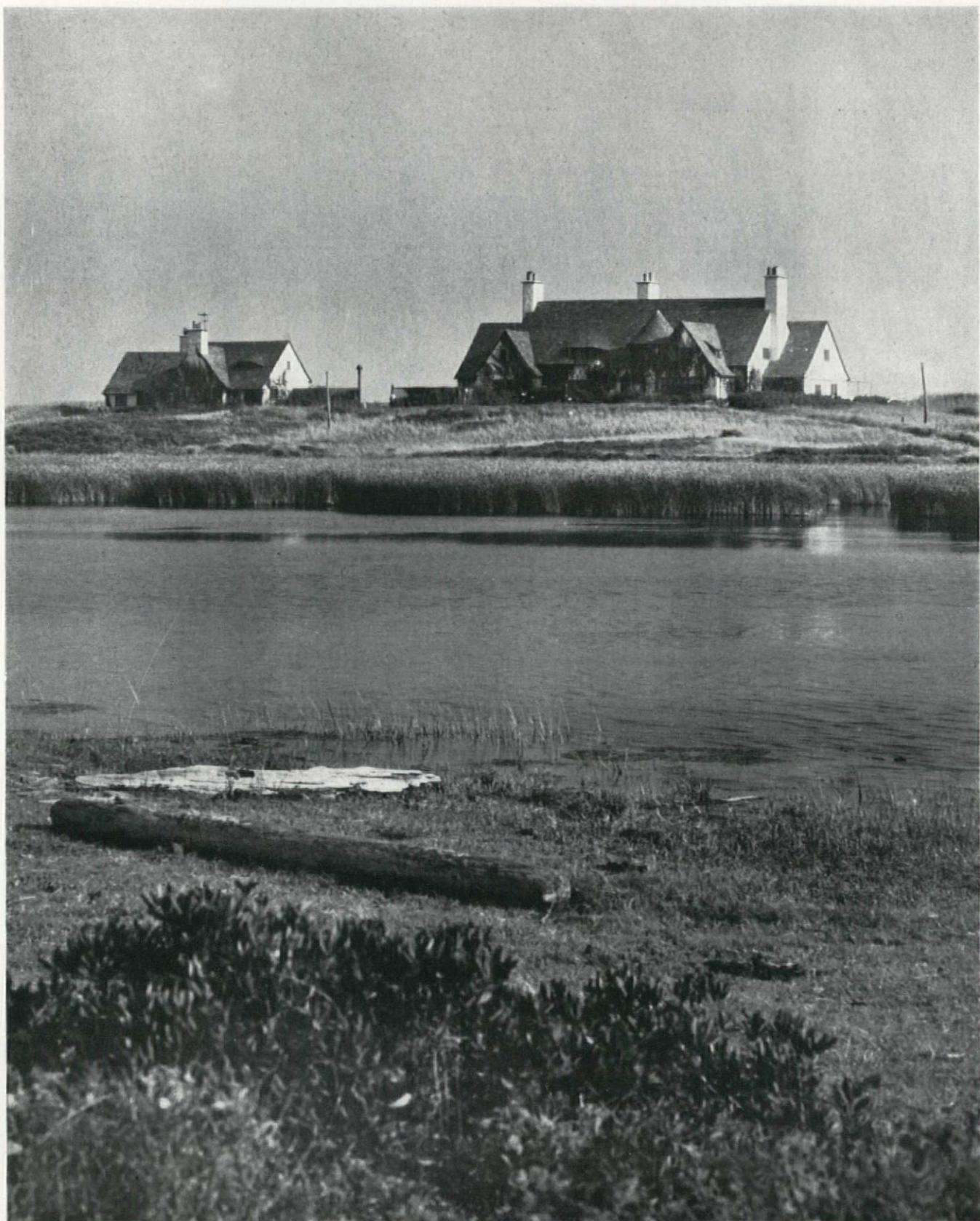




George H. Van Anda



HOUSE OF ELLERY S. JAMES, EAST HAMPTON, LONG ISLAND—ROGER H. BULLARD, ARCHITECT



George H. Van Anda

HOUSE OF ELLERY S. JAMES, EAST HAMPTON, LONG ISLAND — ROGER H. BULLARD, ARCHITECT



George D. Haight

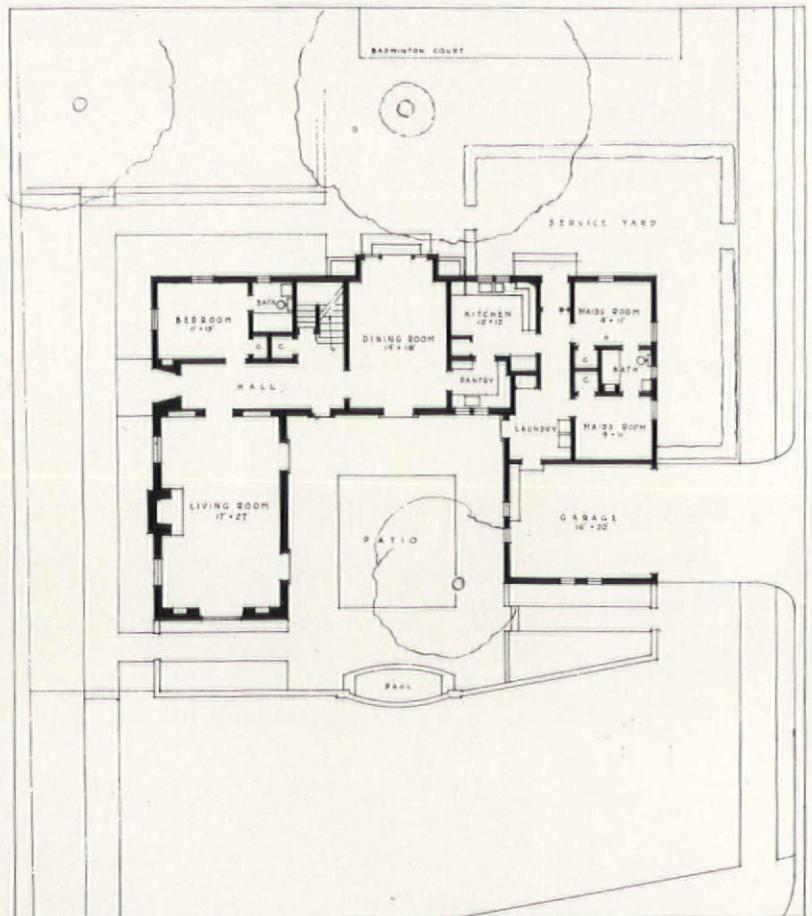
HOUSE OF RALPH FRANKS AT PASADENA, CALIFORNIA — PALMER SABIN, ARCHITECT



George D. Haight

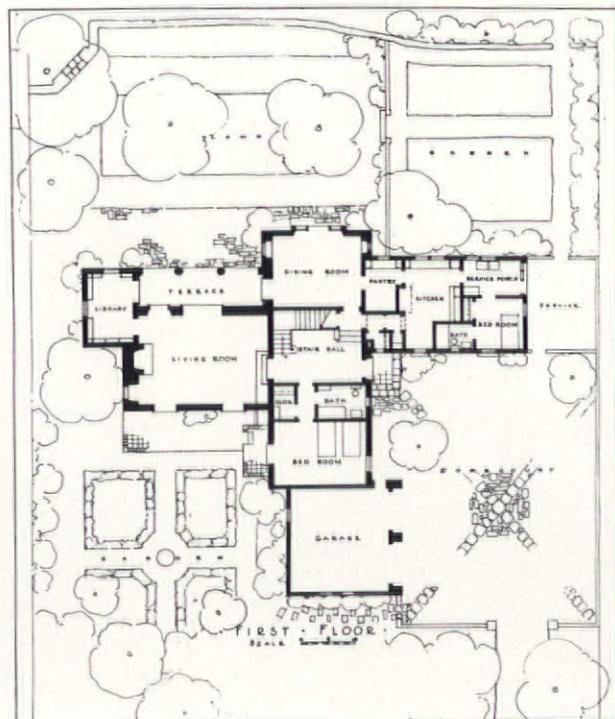
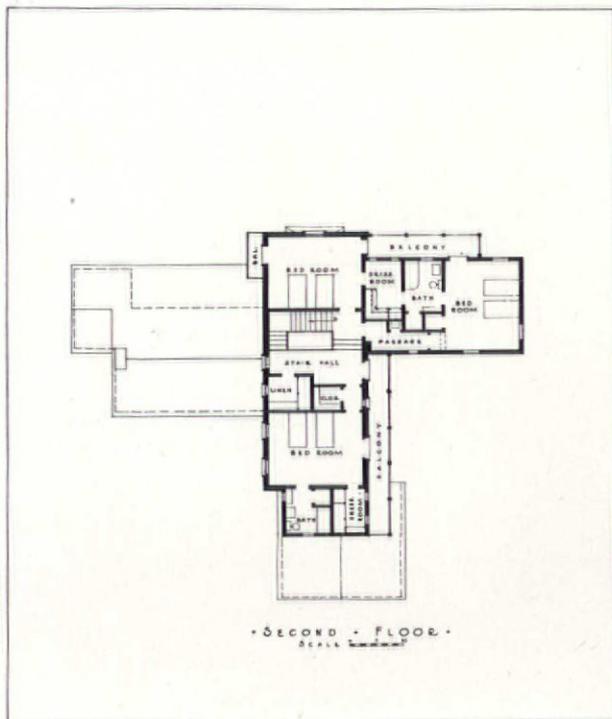
HOUSE OF RALPH FRANKS
PASADENA, CALIFORNIA

PALMER SABIN
ARCHITECT





George D. Haight

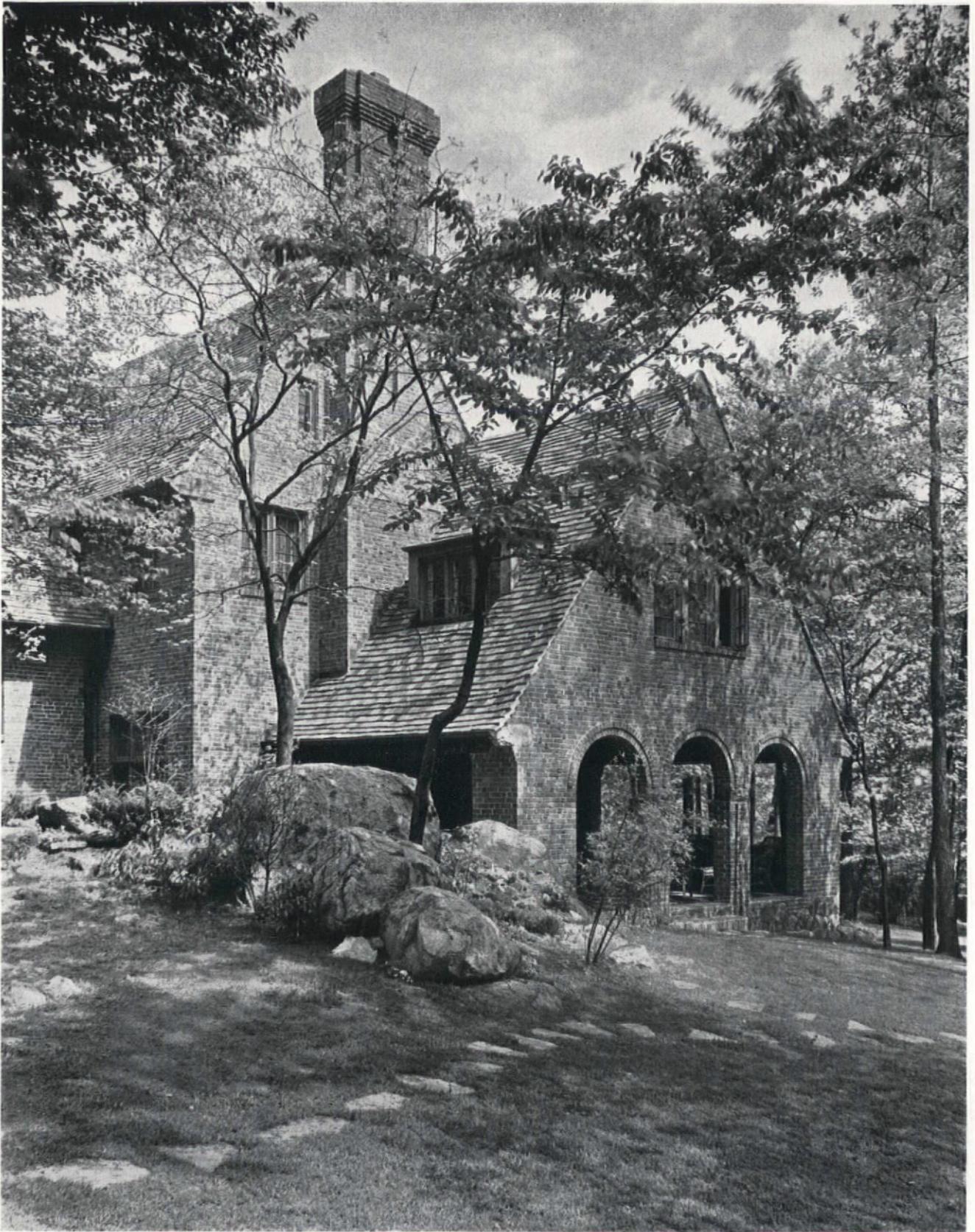


HOUSE OF E. M. SHERMAN AT PASADENA, CALIFORNIA — PALMER SABIN, ARCHITECT



George D. Haight

HOUSE OF E. M. SHERMAN AT PASADENA, CALIFORNIA—PALMER SABIN, ARCHITECT



S. H. Gottscho

HOUSE OF HENRY HEIDE, JR., AT FIELDSTON, NEW YORK — JULIUS GREGORY, ARCHITECT



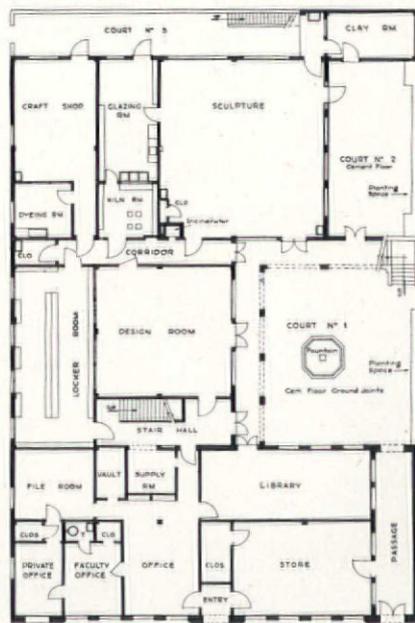
Mott Studios

CHOUINARD SCHOOL OF ART
LOS ANGELES
MORGAN, WALLS & CLEMENTS
ARCHITECTS

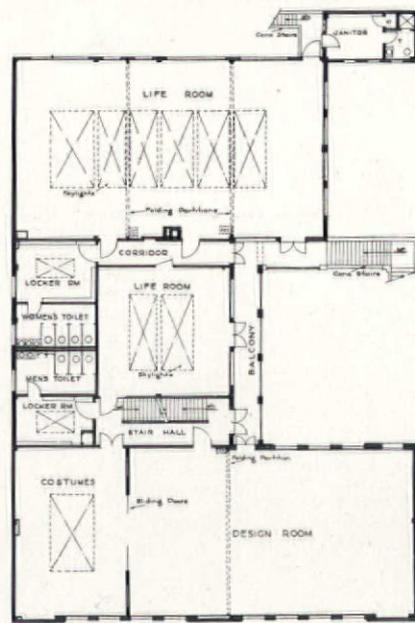
The exterior of the building is architectural concrete cast in pressed wood and milled wood forms and trimmed with black marble across the street front base and about the front entrance. The exterior concrete surfaces are painted a light gray.



Mott Studios



FIRST FLOOR PLAN



SECOND FLOOR PLAN



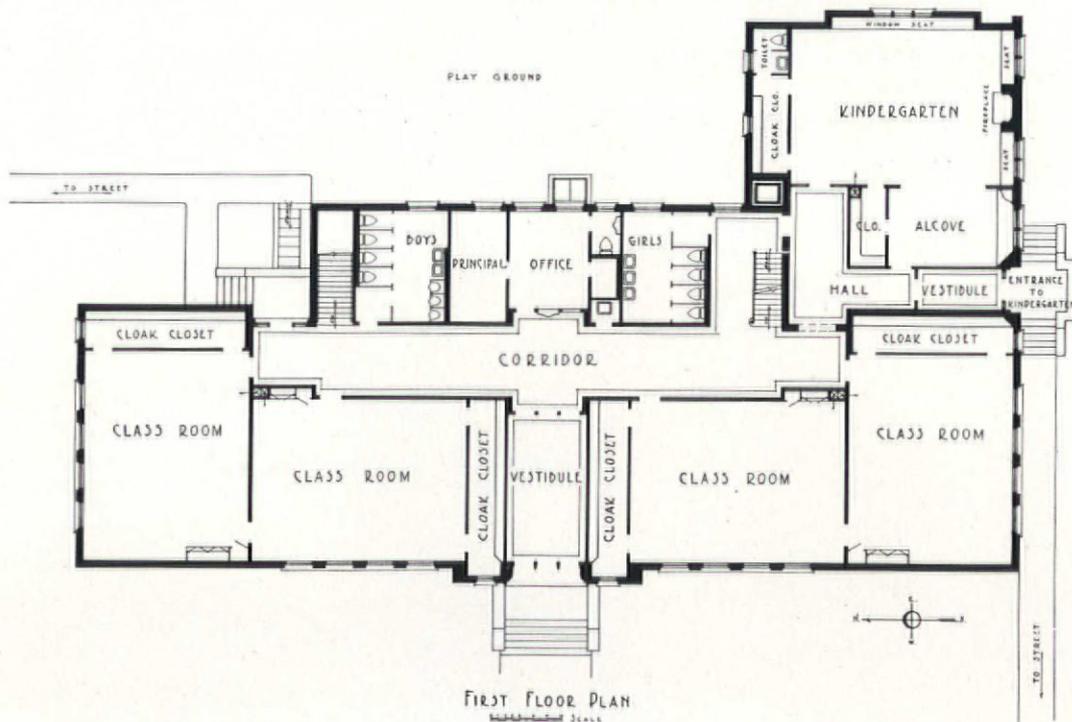
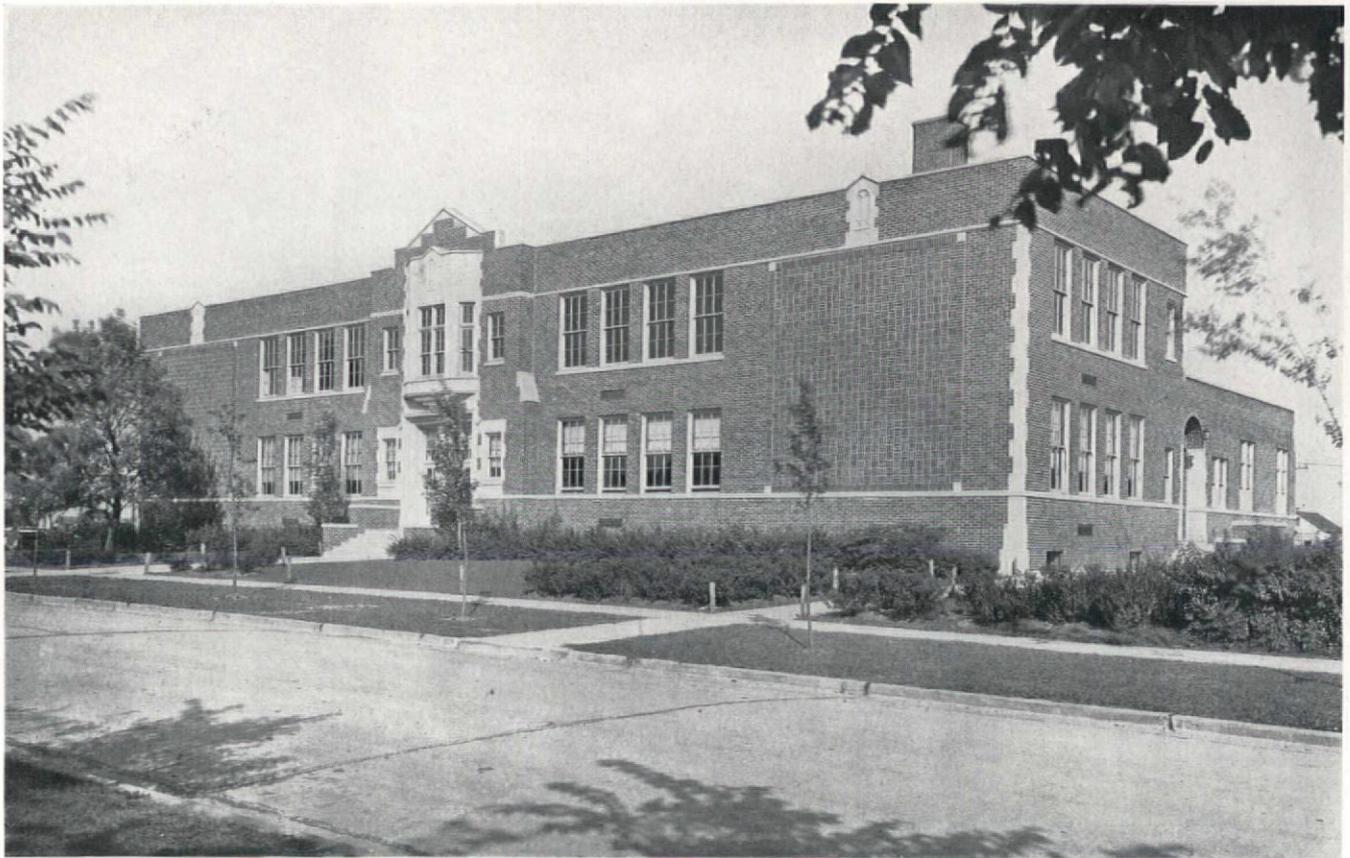
The interior of the building is very plain, and is subdivided into various classrooms with an abundance of light. The color scheme inside is neutral in character, with very light shades and very simple detail.

CHOUINARD SCHOOL OF ART
LOS ANGELES
MORGAN, WALLS & CLEMENTS
ARCHITECTS



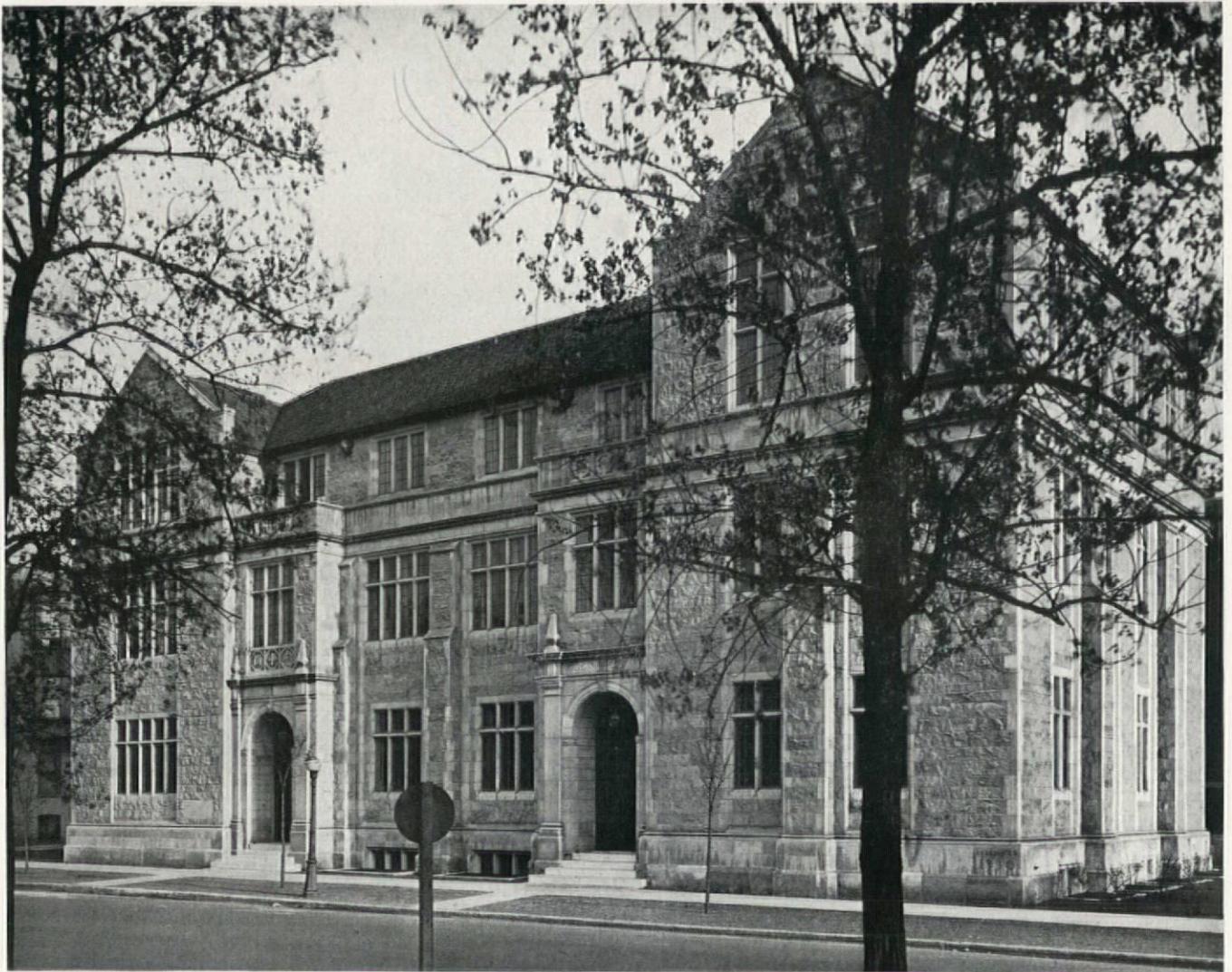
This building was erected to provide two classrooms for each of the first four school grades, and a room and alcove for the kindergarten. It is of fireproof construction. The classroom floors are brown battleship linoleum laid on concrete. The corridors have a light cream-colored terrazzo floor with black border and base. The trim throughout is of oak.

GRADE SCHOOL AT WESTERN SPRINGS, ILLINOIS — JOHNCK AND EHMANN, ARCHITECTS



The kindergarten is treated somewhat as a separate unit. It has a separate entrance so that the young children need not come in contact with the older students. It also permits the discharge of the kindergarten without interference with the rest of the school. The alcove is used for group work and a small room for the storage of toys, etc.

GRADE SCHOOL AT WESTERN SPRINGS, ILLINOIS — JOHNCCK AND EHMANN, ARCHITECTS



Above: Elevation from northwest.
 Right: Reading room.

The building is on a street corner and it is contemplated that some time there will be an extension to the south and to the east to form a quadrangle. The future extension, however, is so indefinite that a compromise plan was adopted making it possible to extend if necessary, but making no actual structural provisions for extension.

The exterior is a split face Indiana limestone.

The building was constructed at a cost of \$206,160, or 94.4 cents a cubic foot.

ADMINISTRATION AND LIBRARY BUILDING
 MEADVILLE THEOLOGICAL SCHOOL
 IN CHICAGO
 DENISON B. HULL, ARCHITECT





Elevation from southeast.

MEADVILLE THEOLOGICAL SCHOOL IN CHICAGO—DENISON B. HULL, ARCHITECT



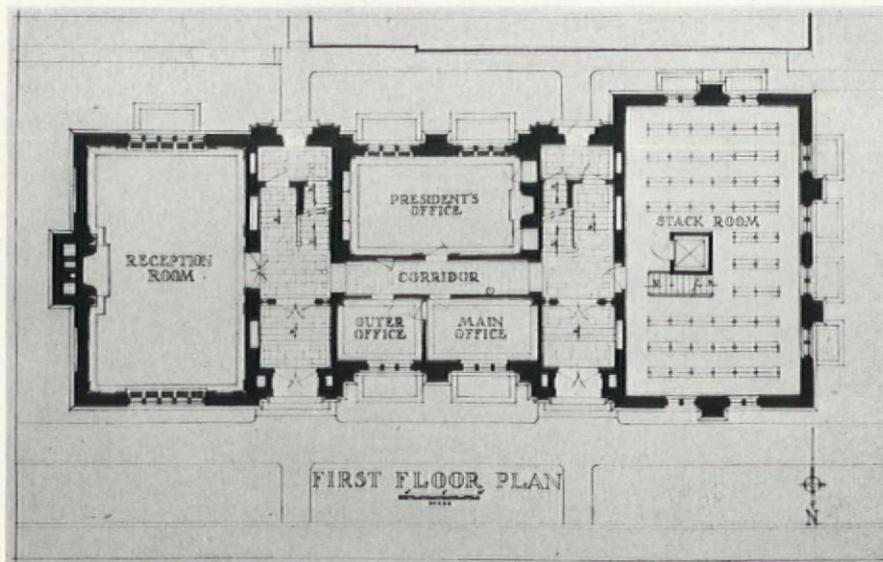
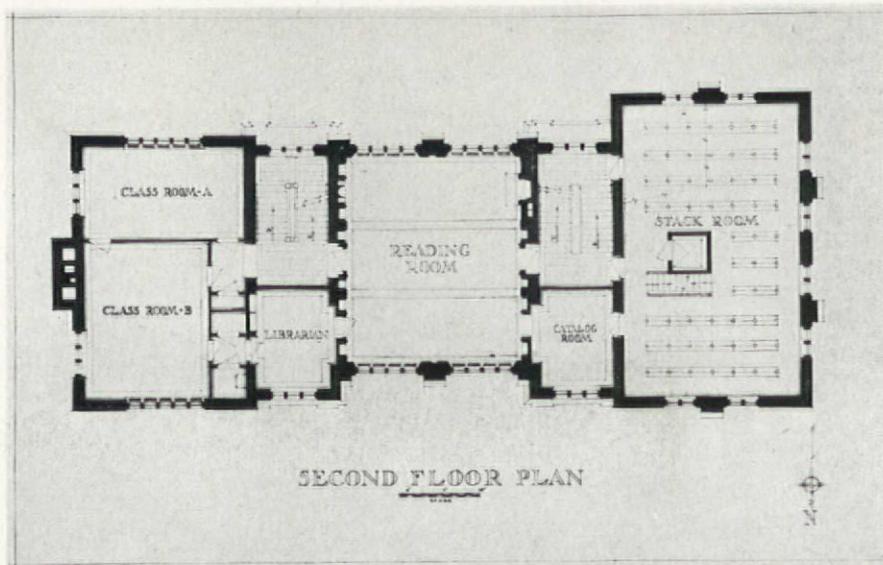
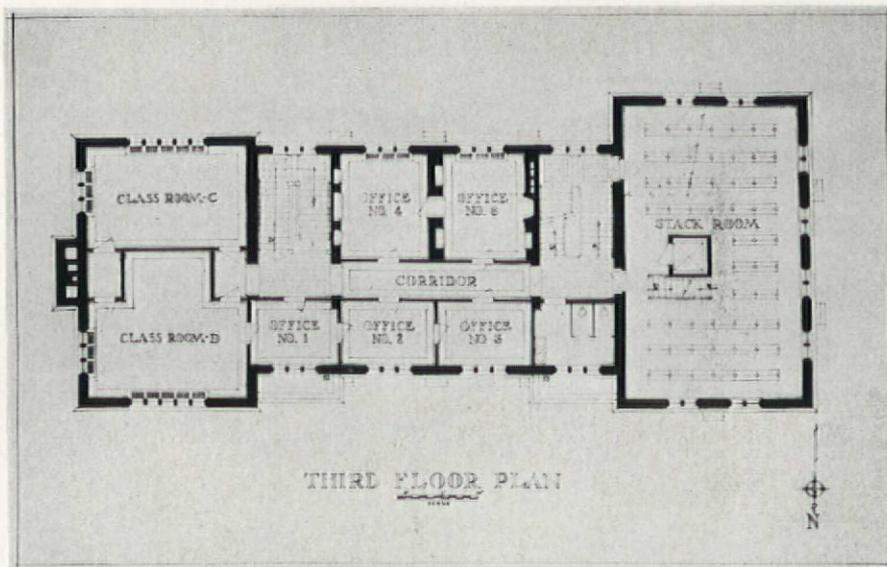
Office interior.

MEADVILLE THEOLOGICAL SCHOOL IN CHICAGO—DENISON B. HULL, ARCHITECT



West stair hall.

MEADVILLE THEOLOGICAL SCHOOL IN CHICAGO—DENISON B. HULL, ARCHITECT



MEADVILLE THEOLOGICAL
SCHOOL IN CHICAGO
DENISON B. HULL
ARCHITECT

ARCHITECT AND CLIENT A CENTURY AGO

By HOBART UPJOHN, Architect

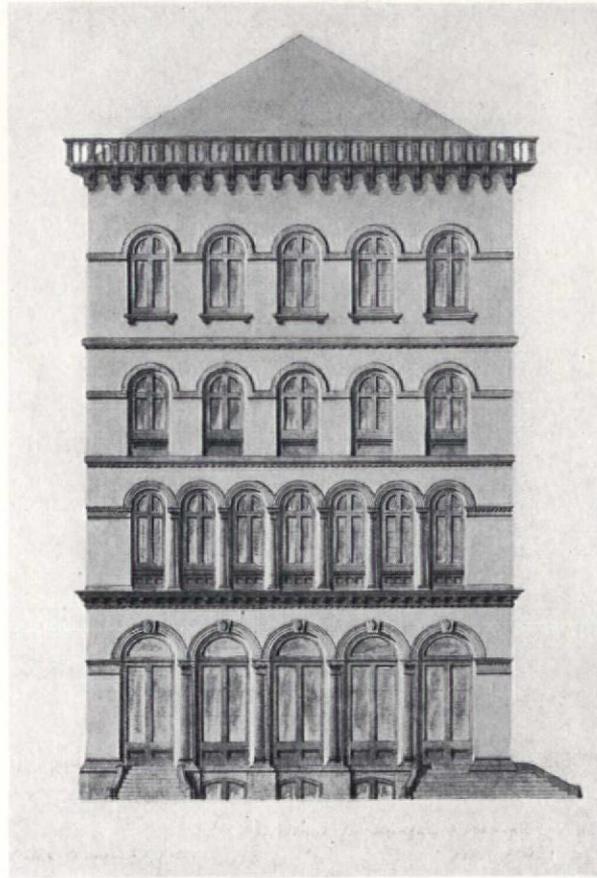
How on earth did the architects of other days conduct their business without the aid of all our modern conveniences? They had none of our efficient mechanical devices—and yet they have left a great many buildings behind. Fortunately, the records of our own office, running back for a hundred years, have been preserved astonishingly well. Both my grandfather, Richard Upjohn, and my father, Richard Michell Upjohn, seem to have been methodical men—a trait which the next in line seems wholly to have missed. Their correspondence, drawings, and other office records are so complete that it is possible to extract from them a rather accurate picture of an architectural office of the last century.

In the early Nineteenth Century architectural education as we know it today did not exist. In the outlying districts many architects were trained in cabinet makers' shops, where an aspiring youth was taught to draw the orders, the correct form of the acanthus, shades, shadows and perspective, as well as the details of construction and house planning. They were even taught rendering and the use of color.

My grandfather seems to have begun practice in this fashion, and he studied carefully "The Cabinet Maker's and Upholsterer's Guide," by J. J. Smith as proof of the thoroughness of his training. How wide the scope of the book was is indicated on the title page, which states that the volume is a "complete drawing book, in which will be comprised treatises on geometry and perspective, to which is added a complete series of new and original designs for household furniture and interior decoration, in the most approved, elegant and modern taste, beautifully and correctly colored from original drawings."

Architects, as such, were to be found only in the larger cities, where the complexities of building required more specialized ability than the ordinary carpenter and cabinet maker could supply. No small part of the architects' functions was instruction of the young, for which purpose it was customary to prepare monographs of their work, elaborated somewhat to take the form of complete guides to architectural practice.

The student spent his evenings studying design by candlelight, and his days in learning the proper use of the saw, the plane with its molding knives, the proper use of carving tools, and how to make joints that would not shrink apart. His practical training included the handling of masonry and other materials used in house building. As an apprentice he was "securely bound to his master for a term of five years," sometimes paying for his instruction as much as two hundred dollars,



Rendering of a building design for Duncan & Sherman—February, 1854.

which might or might not include living with the master.

There were no offices or "plan factories" in those days with hundreds of craftsmen. Three or four apprentices were customary for the large city offices, and in small towns a cabinet maker was able to handle only one or two. The relation between master and apprentice maintained in the architect's office is well illustrated by this letter from Richard Upjohn to a former student:

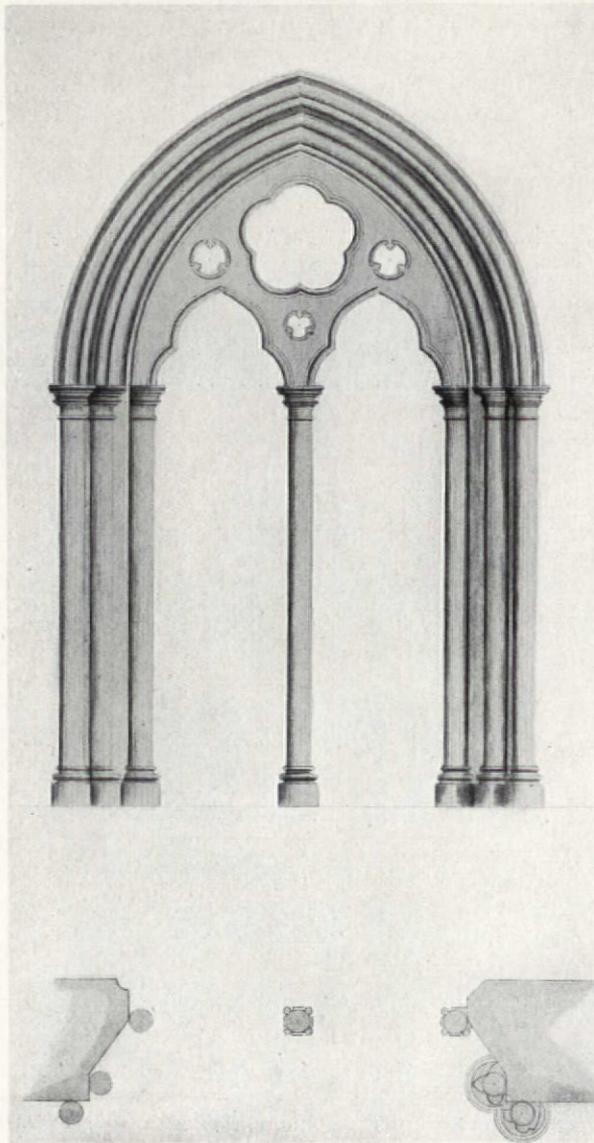
New York, May 21st '40

Dr. Sir—

Yours of the 24th of April mailed the 27 came duly to hand. The hurry of business would not permit my answering it until now.

You say you should like to continue to study Architecture. You ask what I can allow you for board. Three dollars is the sum I give those I have now with me.

It may be should your other business get more profitable than it now is that you would be induced to return again and leave the Study of



Construction details were rendered a century ago. Note pin pricks at arch centers which were made as guides for copies.

Architecture a second time. You had better consider the matter maturely—there is nothing gained by running from pillar to post at the glittering of every dollar that you fancy to see. I write as a friend and for your good. I shall expect to hear from you in a week from now and when I have your answer to this I will inform you whether you can be employed and on what terms. My respects to your friends.

Another letter on the same subject is from Bishop Alonso Potter asking about his son's progress in Upjohn's office. The son later became the Potter of the firm of Potter & Robinson:

My dear Sir,

I shall be obliged if you will write a line stating how my son is doing—as to diligence, punctuality and proficiency. I will also thank you to state when he will, in your judgment, become entitled to some compensation for his services.

Even the graduates of cabinet makers' shops were thoroughly schooled in all the branches of house design and building, because when they were finished their work included doing all the planning, calculating of materials and even buying them. They selected the furniture, rugs and drapes, and of course designed the wall decorations and trim.

Once a man had opened his own office he too became an instructor.

Drawings, made on "antiquarian" paper similar to our Whatman paper, were carefully inked in, and often shadow-lined. Copies had to be made by placing two or three sheets under the original and pricking through the design. With the pin pricks as guides the copies were then redrawn.

Although the architects were not called upon to execute as many drawings as we do today, nor did their working drawings give as much information as ours, they did go to considerable trouble and expense in the preparation of detail drawings. Resembling illustrations from books, they were made in three-quarters scale, using colors to denote texture or materials. Full-size details and special features were often laid out directly on the job. In one instance, Richard Upjohn used the floor of a barn as his drawing board.

Specifications were of the most sketchy nature, for there was not the wealth of material to choose from that we have today. There was nothing parallel to our "General Conditions" for these were largely covered in the contract itself. How general in character they were may be understood from this excerpt from the specifications for a house on Thompson Street in New York—"The owner to be empowered to appoint a superintendent, whose province it shall be to reject any work or materials he may deem not in accordance with the drawings and specifications."

Or again—"The materials and labor to be first quality of their several kinds and well seasoned—windows front and rear, sixteen lights 10 x 14 American."

The specifications, which were copied on foolscap by the apprentices, varied in length, but the average in my grandfather's office seems to have been about six pages in longhand. Sometimes outside assistance was sought, for there are many references in the office files to paying "Mr. Lansing \$1.00 for copying specifications."

Although I have run across no evidence of bonds of completion, the contractor bound himself, "his heirs, executors and administrators" to the complete fulfillment of his contract, setting out the full sum and the condition in which the building should be on specific dates in order to entitle him to stipulated payments as the work progressed.

The handling of correspondence was a vastly different matter in those days from the practice of today. All letters were either written in longhand by the author or by a secretary to whom they were dictated. The latter practice was rare. Although apprentice students did much of the copying and even the writing of letters, many an

architect found himself obliged not only to write the letters but to make file copies as well!

In dispatching mail the letters were folded three times in both directions, the back being left for the address. The letter was sealed with wax, thus making letter and envelope all one piece of paper. Government stamps, of course, did not come into general usage until the middle of the century, so that the post was largely taken care of by private carriers, with private post offices, such as Boyd's City Express, and Swarts Post Office in Chatham Square. Another was Hale and Company of Court Street, Boston, which used hexagonal stamps.

Although city letters were usually delivered for three cents or five cents, out of town mail ran up into much higher figures. For instance, a letter from my grandfather, then practicing in Boston, to Gardiner, Maine, cost eighteen and three-quarter cents. A letter from Boston to New York cost eight cents.

Fortunately for the architects, however, it was customary to charge postage up to the client as recoverable expense!

Letters were filed away in bundles in alphabetical and chronological order, with an annotation on the exposed end, such as "From Rev. ———, Saratoga, Feb. 13, 1843."

One end of each of these bundles was covered with a stiff piece of cardboard on which was written the date and initial letter of the authors contained therein. These were stuffed away in pigeonholes. This method of filing was simple and easy to handle, for when the master wanted an old letter for reference, he simply dug out the package for the period and searched until he found it.

One happy circumstance in this connection was the price of postage and the difficulty of making copies tended to reduce the volume of correspondence, a great advantage over our present system in which convenience tends to useless volubility.

Of course, there were no telephones, and telegrams were unknown until 1850. Naturally, this often increased the complications that invariably arise in the construction of any building. One of the most interesting controversies by correspondence in which Richard Upjohn engaged was with R. H. Gardiner, of Gardiner, Maine, in connection with what has since become a rather famous "down east" mansion. It was this house, incidentally, to which Nathaniel Hawthorne refers in his *American Notes* after a visit there in 1836 while the building was being erected.

"The new building was estimated to cost about thirty thousand dollars," Hawthorne wrote, "but twice as much has been expended, and a great deal more will be needed to complete it. It is certainly a splendid structure . . . and well deserves the name of castle or palace."

Between Boston, where Richard Upjohn had his office until 1839, and Gardiner, Maine, there passed many an interesting letter, showing how varying then, even as now, the relation between

architect and client may be. In 1837, for instance, when another depression had the country in its grip, Richard Upjohn wrote to his friend and client for "ten or thirty or even fifty bushels of the best eastern potatoes, three or four barrels of good keeping apples and anything else that can be obtained without cash . . . All my business is gone, all my means, nearly all my credit—seven of us in the family—wood and coals—flour and all other stuff high—nothing to be got at without money, am living in hopes of doing something next spring."

The following letter written to a complaining client shows that the practice of architecture in 1837 was the same as it is today:

Boston Nov 23 1838

Sir

Yours of the 1 just came to hand the 21th and this is the reply. You expected when you agreed that the days should be "common days." Since it was your expectation let it be so nevertheless 8 hours is my day and \$6 per day my charge for the generality of work and which I have rec'd for two years past. "A good deal of work drawn wrong, which had to be sent back and drawn over again." Your letter of May 27 1835 and my answer thereto is a sufficient explanation and shows that the men on the works were not capable of understanding the plan notwithstanding it was set out full size on the barn floor. My letter of June 2 1835 is another refutation of "A good deal". Your letter of June the 15 1835 turned a great deal of the masonry as planned by me topsy turvy you sent me word thereof with a sketch of the alteration of the interior laying down the rooms as suggested by you I gave you correct plans of said work. At the time I see no complaint on reading the letters of correspondence about the plans being done wrong. "A great deal of unnecessary work done on the working plans". I do not estimate the value of a plan by the mere labour bestowed on the same as that is merely secondary. I have never drawn plans for you simply to make labour and thereby increase the number of days work. I have and my assistants have spent more time by far than has been charged on my acct. your plans were done with as little expence as possible and taking into consideration that you called on me to give you plans for a building of such magnitude when the cellars were digging—that the plans were necessarily got up in great haste—that the distance from Boston to Gardiner being so great prevented my seeing the works so often as I ought—that you were continually changing your mind in relation to many important points while the building was actually in a state of progress that you never had a man on the building fully qualified to conduct its erection that your letters to me were generally written in great haste that my plans had to be sent off piece-meal instead of their being made all at one time and compared one with another,

copied, revised, and arranged in the usual methodical manner I say taking these things duly into consideration and that your house so far as it has been finished does meet your expectation and that the architectural effect thereof is good there can be no just reason at this late hour for complaining of my bill, for deteriorating the value of my services, for complaining and finding fault with my plans when there is no just cause for so doing. The \$70 proposal is a monstrous reduction—The bill is honest, my circumstances oblige me to accept what I cannot in justice to myself assent to. I have just been requested to give in my terms for superintending a building just about being erected after plans made by myself 5 per cent on the cost was my charge which was pronounced reasonable.

Very respectfully
your most obt Svt
Rich'd Upjohn

P.S. Please to send by return of post

There must have been justice on the architect's side, for according to the early records of the firm, there was no deduction made in the bill.

The letter brings in the quotation of 5 per cent as a proper charge for services of superintendence. Later, the architects of the day adopted a general charge of 5 per cent for complete services, which, however, was never interpreted as binding. On a smaller building, for instance, the charge sometimes ran as high as 10 per cent, an instance of which I found to be a church in Saratoga, New York, which was a rather intricate piece of work.

On the other hand, the charge for Trinity Building in New York, which was a simple job and of large cost in proportion to the effort expended, was $2\frac{1}{2}$ per cent.

Some rather miscellaneous accounts of the time indicate how curiously un-uniform the charges were. I find such things as:

"Mr. Stone, Dr. For working plans of house. Paid \$4.00"

"July 9, 1835, G. Babcock, Esq., Dr. Plan, front steps and fence. \$6.00"

"Mr. Fenno. Plan of machine cutting ice. \$8.50"

"City of Boston to Richard Upjohn, Dr. Plans of African School House, begun 8 September, finished December 16, \$50.00"

In the work done for the Episcopal Church at Bangor, Maine, he seems to have fared better, for he received \$410.25 for "plans, elevations, working plans, sections, etc. necessary for the erection of said church made and delivered at sundry times from July 31, 1835 to November 28, 1836, pursuant to orders given by Charles Hayes, Esq."

The year 1838 apparently was a little worse, for the total receipts for the year were only \$247.50, and only \$77 for the first four months of 1839. It was at this point in his life, however, that the gods smiled upon Richard Upjohn, for through the good offices of his friends the Hon. Samuel Atkins

Eliot, mayor of Boston, and Rev. Jonathon Mayhew Wainwright, afterwards Bishop of New York, he was retained as superintendent in charge of repairs for the changes to be made on Trinity Church, New York. His salary was fixed at \$200 a month.

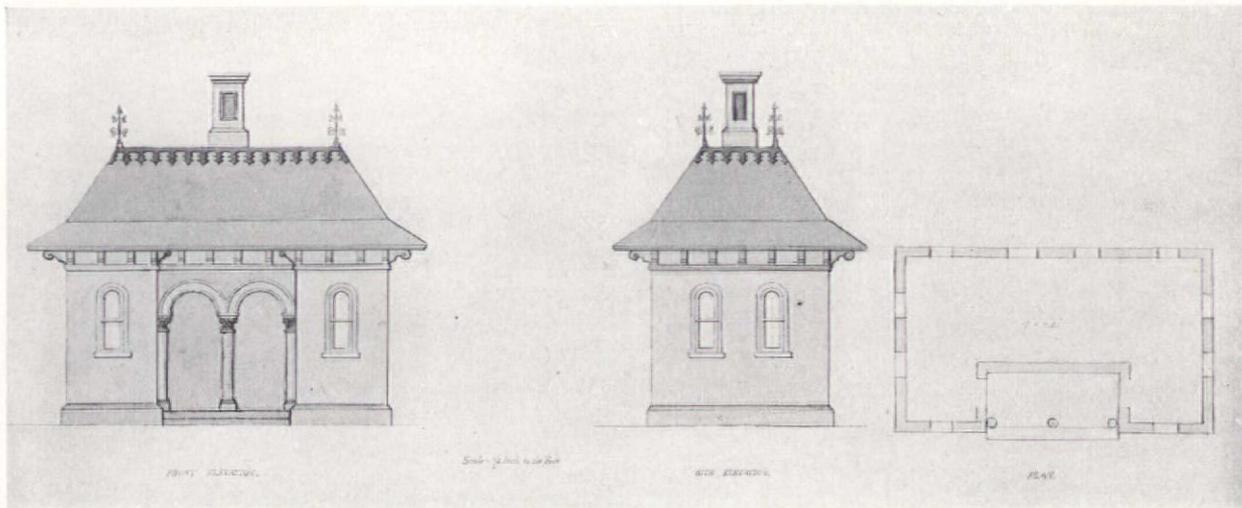
But like a good architect, he convinced the vestry of the church that more than repairs were needed, and we find him writing back to his wife in Boston that he had been able to "persuade the vestry of Trinity Church to tear down and build anew."

Later his salary was increased to \$250 per month in consideration of his undertaking to superintend and hold himself responsible for the "close and faithful execution of the whole work, whilst employed as architect and to devote his whole time and attention thereto except as the committee shall deem proper at specified times, to dispense with his personal supervision."

In 1842, however, it was proposed that his salary be reduced to \$2,400, and the following year to \$2,000, to which the architect replied:

Hitherto I have rather avoided than sought occupation lest it might be imagined by the Committee or others having less opportunity of judging, that such occupation might interfere with my duties at Trinity Church, though in fact what I have done has proved a benefit by making me acquainted with the merits or demerits of workmen in their various branches, but hereafter I should wish it understood that I am to be at liberty to undertake the erection of any other buildings and the privilege of visiting the said buildings for the purpose of inspecting the work, my absence not being more than three days at any one time and generally not more than one or two, meaning always that my first attention be given to Trinity Church where indeed my duty interest and reputation first call me.

The reduction in my salary of six hundred dollars the Coming Year and One thousand dollars in the Year 1844 will make this necessary and I have lately declined making designs for a church (as I have in two other instances before) which had I known of the intended reduction I would not have done. I would also remark to the Committee that hitherto during the erection of the building I have designed and drawn a great number of plans, many of which have been made as the progress of the work seemed to require and in anticipation of which I supposed would be required by the Committee and with the intention of making the details of the designs as clear and explanatory as could possibly be done so that the Committee should understand the nature of the respective designs and the amount of work delineated by them when they were called upon to adopt a design which required to be executed immediately. In doing this, however, many designs and plans have been made which were not adopted and therefore not now necessary to the erection of the building. These plans together with those detailed plans of the building which have been



Working drawings of a 19th century railway waiting station.

and which may be adopted in the prosecution of the works, I should like to be considered mine and when the Church is so far completed as will ensure no alterations in the design and construction of its several parts, I will draw a set of Plans consisting of

- 1 A Ground Plan
- 2 Front Elevation
- 3 Rear Elevation
- 4 Side Elevation
- 5 Longitudinal Section
- 6 Transverse Section

to be kept in the archives of the Church which will be of use in case of any repairs and alterations that may take place at any future time.

Your Most Obed. Serv't
Richd. Upjohn

The final agreement between the architect and church was a close approximation of the stated terms, and it is reproduced here as a rather unusual record of service:

First: the said Richard Upjohn shall be at liberty during the continuance of this Agreement to accept employment as Architect of other buildings, but so as not to interfere with the due and efficient discharge and performance of his duties as superintending Architect of the said Church Edifice, it being understood and expressly agreed that he is at all times to devote and bestow so much of his time, attention, care and services in and about the construction of the said edifice, and in the making and furnishing of the requisite drafts, plans, models and designs for the various parts thereof in the course of its further progress, as may be necessary to or useful in the due and efficient discharge and performance of such his duties and for this purpose he shall continue to occupy as the place of his business the office building now in the Church Cemetery, so as by his personal care, attention and supervision, to regulate direct and control

all the work going on in and about the said Edifice, and secure its completion in the most skilful substantial and economical manner; And that he is not to absent himself from the city of New York for more than four days in one month without the consent of the Building Committee of the Vestry of the said Corporation, who shall be charged with the erection of the said Edifice.

Second: The compensation of the said Richard Upjohn whilst and so long as he shall continue in the due and faithful discharge of the duties above mentioned, shall be one hundred and sixty six dollars and two thirds of a dollar per month to commence from the first day of January instant, and to be paid monthly thereafter, it being understood mutually, that during this and the next year if he shall so long continue, by common consent in the employ of the Church, no increase of or deduction from this compensation is to be proposed by either party.

Third: All the plans, drafts, models, designs and computations heretofore made or hereafter to be made by the said Richard Upjohn, whilst in the employ of the said Corporation, except as is hereinafter specified, shall on the completion of the said Edifice be deemed his personal property, and be at his absolute disposal, provided always that the perspective drawings of the new Church Edifice, and of the old Edifice, as formerly proposed to be altered, now in the said Office building are to remain there as the property of the said Corporation, and that a full and accurate ground plan of the new Edifice, and full and accurate plans and drawings of the elevations of the front, rear and south sides of the new Edifice, and also longitudinal and transverse sections thereof, in conformity with the actual construction of the Edifice and its various parts, when the same shall be finished and completed, are to be drawn, made and furnished by the said Richard Upjohn to and are to be and remain the absolute property of the said Cor-

PROFESSIONAL PRACTICE AND CHARGES
OF ARCHITECTS,

BEING THOSE USUALLY AND PROPERLY MADE;
AND ENDORSED BY THE

American Institute of Architects.

For full Professional Services (including Superintendence,) 5 per cent. upon the cost of the work.

PARTIAL SERVICE AS FOLLOWS:

For Preliminary Studies, - - -	1	per cent.
For Preliminary Studies, General Drawings, and Specifications, -	2½	per cent.
For Preliminary Studies, General Drawings, Details and Specifications, - - - - -	3½	per cent.

For Stores, 3 per cent. upon the cost, divided in the above ratio.

For works that cost less than \$5,000 or for Monumental and Decorative work, and Designs for Furniture—a special rate in excess of the above.

For alterations and additions—an additional charge to be made for surveys and measurements.

An additional charge to be made for alterations or additions in contracts or plans, which will be valued in proportion to the additional time and services employed.

Necessary travelling expenses to be paid by the Client.

Time spent by the architect in visiting for professional consultation, and in the accompanying travel, whether by day or night, will be charged for, whether or not any commission, either for office work or superintending work, is given.

The Architect's payments are successively due as his work is completed, in the order of the above classifications.

Until an actual estimate is received, the charges are based upon the proposed cost of the works, and the payments are received as instalments of the entire fee, which is based upon the actual cost.

The Architect bases his professional charge upon the entire cost, to the Owner, of the building when completed, including all the fixtures necessary to render it fit for occupation, and is entitled to a fair additional compensation for furniture or other articles designed or purchased by the Architect.

If any material or work used in the construction of the building be already upon the ground, or come into possession of the Owner without expense to him, the value of said material or work is to be added to the sum actually expended upon the building before the Architect's commission is computed.

Drawings, as instruments of service, are the property of the Architect.

By order,
A. J. BLOOR, Secretary. RICHARD UPJOHN, President.

poration the whole to correspond in style with the plans and drawings already made and furnished by him and now in the said office.

From the time that Trinity was completed and its national influence felt Richard Upjohn received many letters from brother architects all over the country for advice on all sorts of subjects, including how to avoid warping, the proper proportions for mortar and concrete, and how much to charge for professional services. There is no doubt that architects were constantly exchanging ideas privately on these and many other matters, but there was no definite, concerted effort to adopt standard practice and to establish workable customs.

Each architect was an entirely independent unit, often suspicious and jealous of his immediate neighbors, even resorting at times to questionable methods of obtaining work. As one architect put it, it was not uncommon for an architect to "watch the door of a competitor to see whether or not he seemed to be receiving prospective clients, and to find out who they might be. If he saw his competitor leave his office with a set of plans he would follow him to learn who the job might be for, and then to make a request to be considered by the client."

Government work was especially bad for not only were the rules of competition impossible, but the remuneration was so small that there was little left for the designer.

The founding of the American Institute of Architects was the signal for a change in practice. At the first regular meeting of the Institute, as recorded by Richard M. Hunt, Secretary, the president, Richard Upjohn, made the following significant comments in his opening address:

"Our efforts in the formation of the 'American Institute of Architects' have been successful. A few weeks past we were what we have always been, single handed—each doing his own work, unaided by, and to a great extent, unknown by each other; possessing no means of interchange of thought upon the weighty subjects connected with our profession, pursuing our individual interests alone, and separately endeavouring to advance, as we were able, each one his own respective position. That history is now past. A quarter of a century is sufficient time, nay, too long, for an experiment in working to such a disadvantage. We were ripe for the change which has resulted in our union, and we may well congratulate each other that we are able to meet on common ground, to consider and execute all those plans which will 'promote the scientific and practical perfection of its members, and elevate the standing of the profession.'"

The founders of the Institute inaugurated many improvements in education, in business methods, in practical construction, and in mutual confidence. Progress has been slow but continuous. The architect has taken a greater and higher position in modern society, a position which can be advanced still further by the adherence to the credo laid down by the founders of the Institute in 1857.

AN EARLY A.I.A. DOCUMENT

MODERNIZATION and ALTERATION



Kaufmann-Fabry



Main dining room before remodeling.

REMODELED DINING ROOM
HOTEL KNICKERBOCKER
IN CHICAGO
J. R. DAVIDSON, DESIGNER

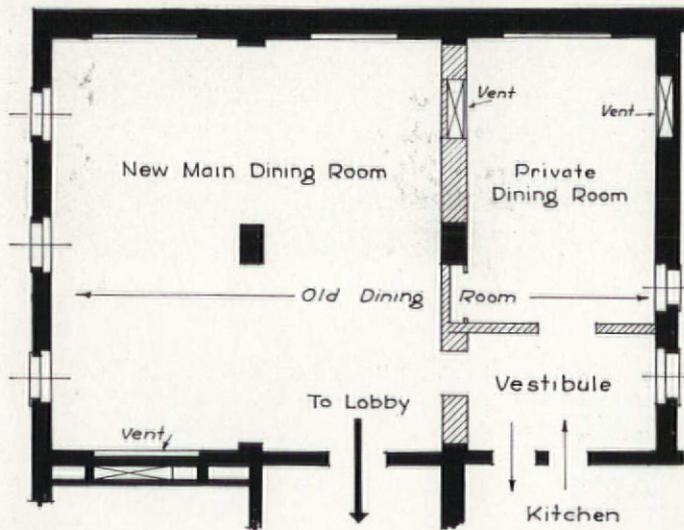
The dining room, unnecessarily large, was reduced to one-third its size, and an additional private dining room was created, together with a vestibule connecting both spaces with the pantry (see plan, page 384). New walls covered entirely in Flexwood; windows framed by solid walnut moldings. Four silk-covered panels serve as background for boxes with exotic plants. Color scheme: light terra cotta ceiling, dark plum carpeting, rich gold window drapes, pale gold wall panels. Wall lights, ground glass and polished brass.



PRIVATE OFFICE of Catering Dept.

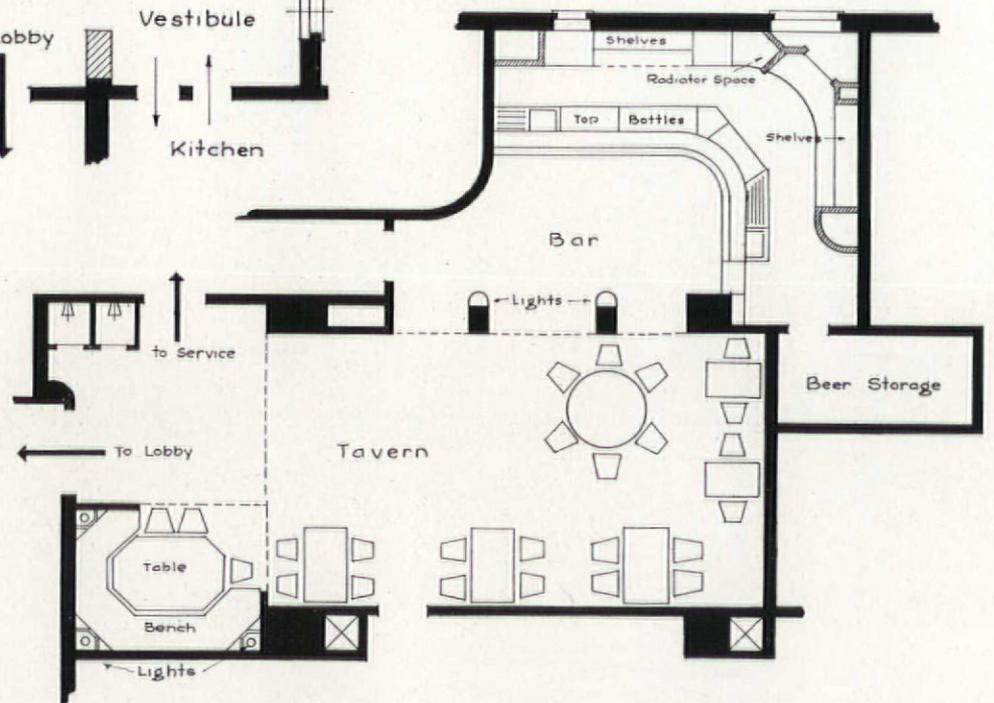
This room is reserved exclusively for conferences with the catering manager. A sample collection of favors and table decorations is displayed in the built-in wallcase. Color scheme: medium gray ceiling and carpet; light gray walls with white and yellow lines; corner seat in green Fabrikoid with dado to match; map mural in shades of gray with touches of yellow.

Kaufmann-Fabry



Left:
Plan of Remodeled
Dining Room.

Below: Plan of Bar and Tavern.



HOTEL KNICKERBOCKER
IN CHICAGO
J. R. DAVIDSON, DESIGNER



Left: Bar.



Right: Lobby side of entrance door. Mahogany, polished copper, plate glass, red letters with blue lines below letters.

HOTEL BAR AND TAVERN

With the legalization of beer came a demand for space not originally provided in the hotel which had been built during prohibition. Hall space had to be sacrificed and an office and beauty parlor removed (see plan, opposite page). Various ceiling levels and columns conceal existing vent ducts and plumbing pipes. Color scheme of bar: dark purplish brown ceiling and walls in front of bar, crimson red lacquer counter and back walls with copper ceiling, pale yellow shelf niches and windows. Color scheme of tavern: walls and ceiling in shades of gray and tan, polished copper ceiling fixture, dark blue tables and chairs, dark blue walls around booth with inside walls and ceiling of natural pine plywood, purplish brown leather built-in seat.



Kaufmann-Fabry

HOTEL KNICKERBOCKER
IN CHICAGO
REMODELED BY
J. R. DAVIDSON, DESIGNER

ARCHITECTURE
and REAL ESTATE
UNDER ONE ROOF

•
AN OLD STABLE NOW
USED FOR OFFICE SPACE
AND LIVING QUARTERS
NEW YORK CITY

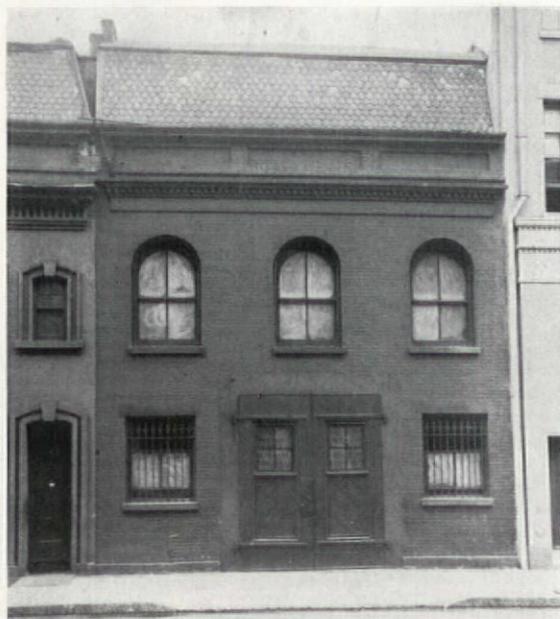
THOMAS WILLIAMS
ARCHITECT



F. S. Lincoln

The urban architect today finds it increasingly necessary to cooperate with others outside of his profession in order to arrive at intelligent solutions to many of his problems. Although information concerning purely structural problems is readily accessible to the architect, he often finds it impossible to answer related questions of land values, space demands and building operation upon which depend the success of his projects. Conversely, the building manager or real estate broker can benefit greatly from close co-operations with a competent architect.

With these considerations in mind two brothers have combined under one roof, in this alteration at 6 West 8th Street, New York City, a real estate office and an architectural office; and upstairs, incidentally, an apartment for themselves and a second apartment for lease.



Keller Construction Co.

Old stable building comprised:

1. Carriage room at front.
2. Rear extension with skylights and old horse stalls.
3. Second floor, former coachmen's quarters.
4. Top floor, old billiard room with skylights.
5. Yard in rear with old coal storage.

Location:

1. Front on business street convenient to properties under management of real estate office.
2. Rear with southern exposure on fine residential neighborhood.

Minimum changes to front:

1. Stable doors replaced by exhibition window.
2. East window cut down for new entrance.
3. New painting. Color scheme of French gray walls and light blue blinds.
4. Attempt to bring out character of building and give effect of dignity.

First floor:

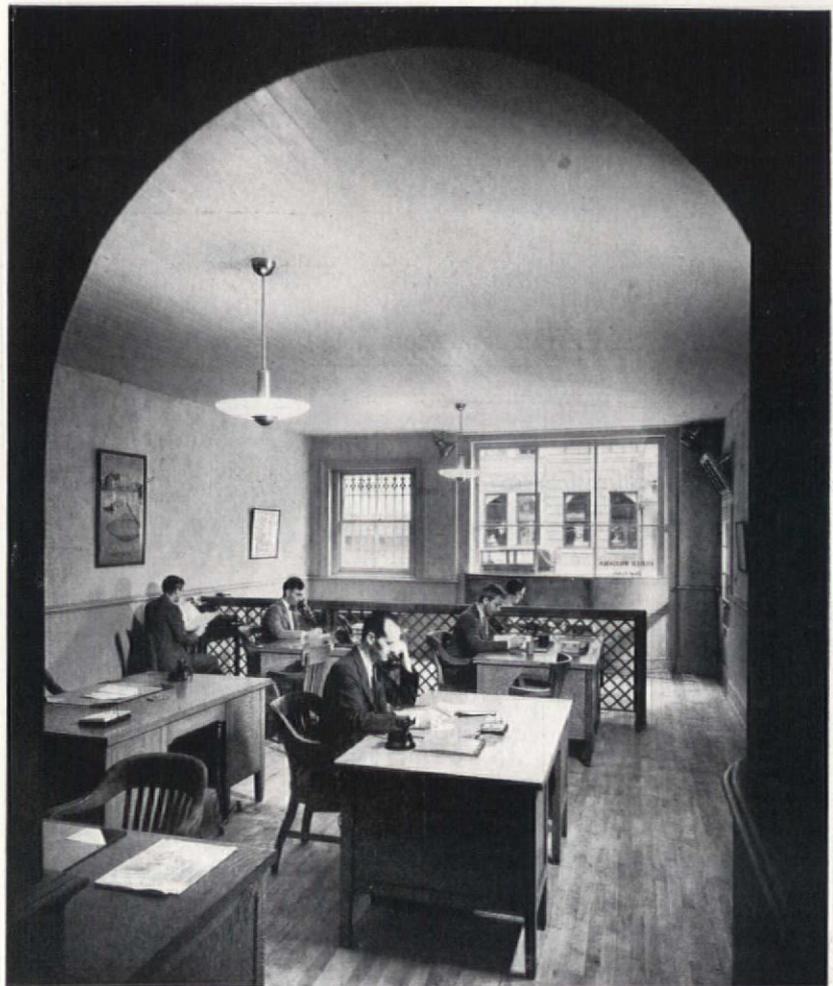
1. Real estate office in carriage room at front—(a) importance of sidewalk space; (b) opportunity for exhibition space; (c) railing made of cast iron panels from stalls.
2. Architectural office in rear extension—(a) good top light; (b) utilization of old stalls as partition; (c) quiet garden exposure.
3. Dark space at back of old carriage room devoted to—(a) boiler room; (b) conference room for both offices; (c) storage, toilet, etc.
4. Access to upper floors. (a) Apartment entrance hall at front; (b) circular stair in garden for benefit of owners' apartment.
5. Garden developed in rear yard. (a) Old coal bin altered to pergola.

Upper floors:

1. Owners' duplex apartment of primary importance—(a) three bedrooms on southern exposure; (b) large studio, living room on third floor, with adjoining kitchen.
2. Front apartment on second floor designed for income—(a) convenient bathroom access; (b) closet space.
3. Second floor arranged with view to possible addition of rear bedroom to front apartment.

General internal arrangement governed by existing

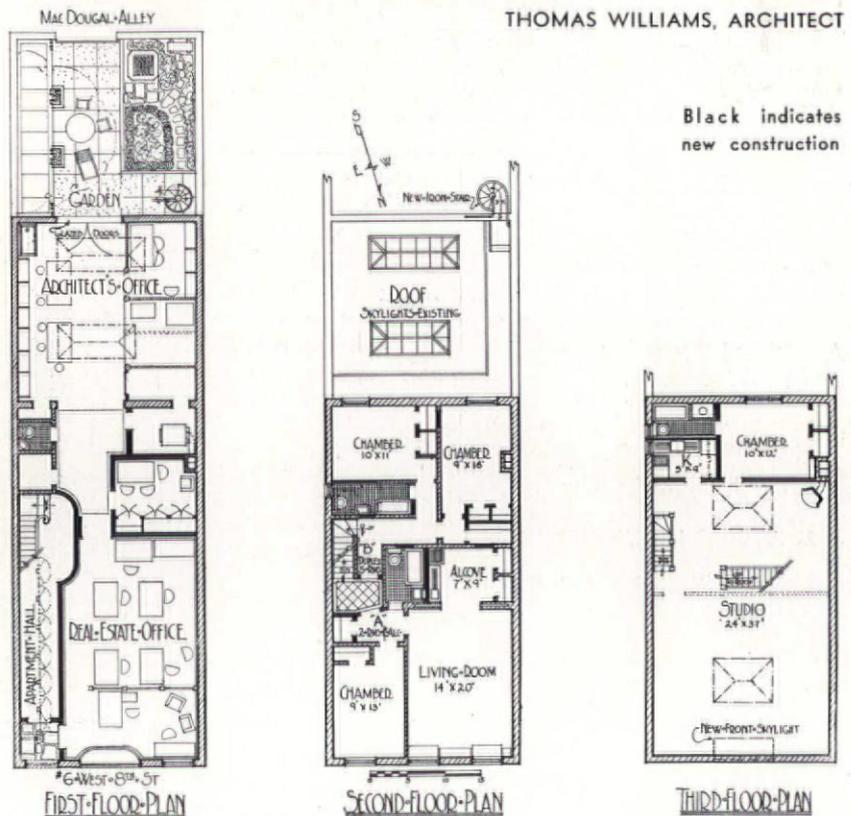
1. Staircases.
2. Plumbing stack and first and second floor toilets.
3. Chimney.



F. S. Lincoln

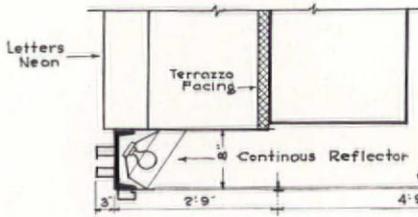
Interior of Real Estate Office.

THOMAS WILLIAMS, ARCHITECT

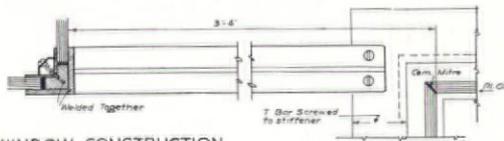
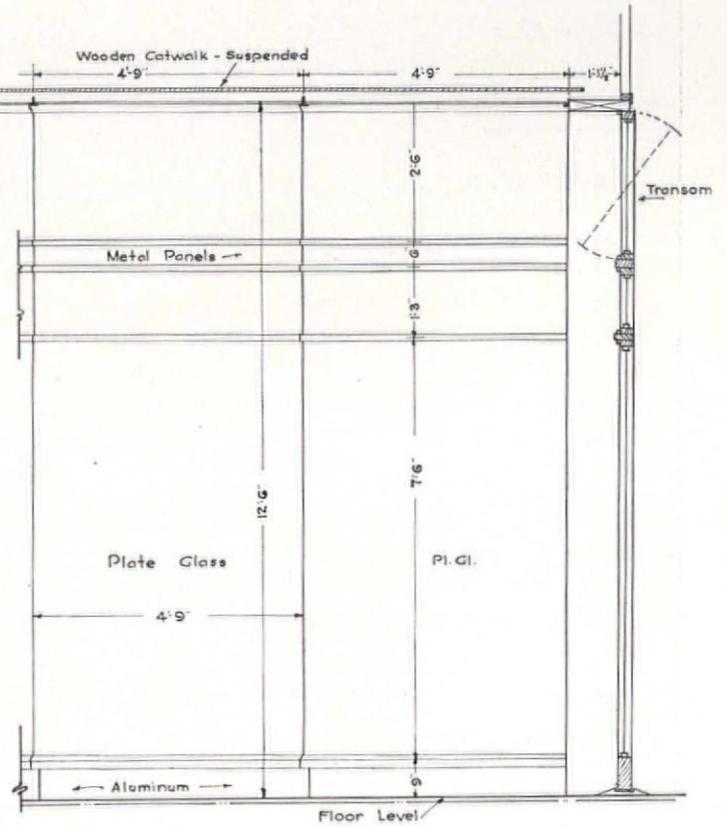


REMODELING A CHAIN STORE FOR WOMEN'S DRESSES

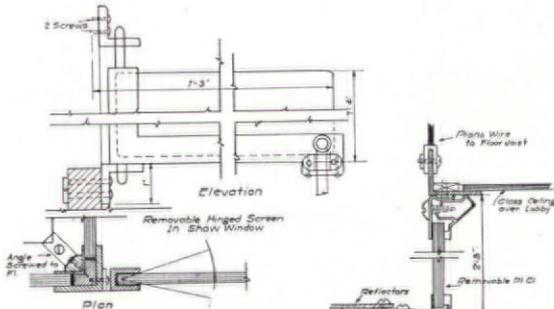
J. R. DAVIDSON, DESIGNER
HOLLYWOOD, CALIFORNIA



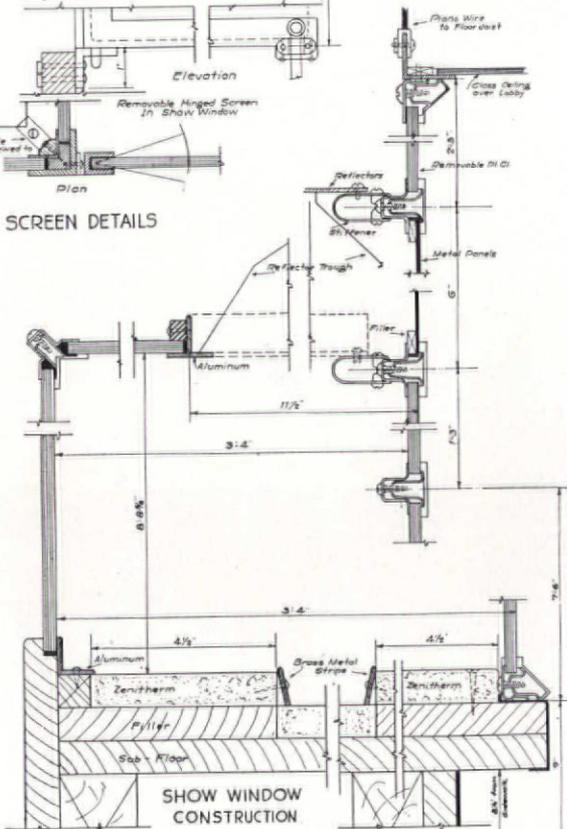
SECTION THROUGH LOBBY AND MARQUEE



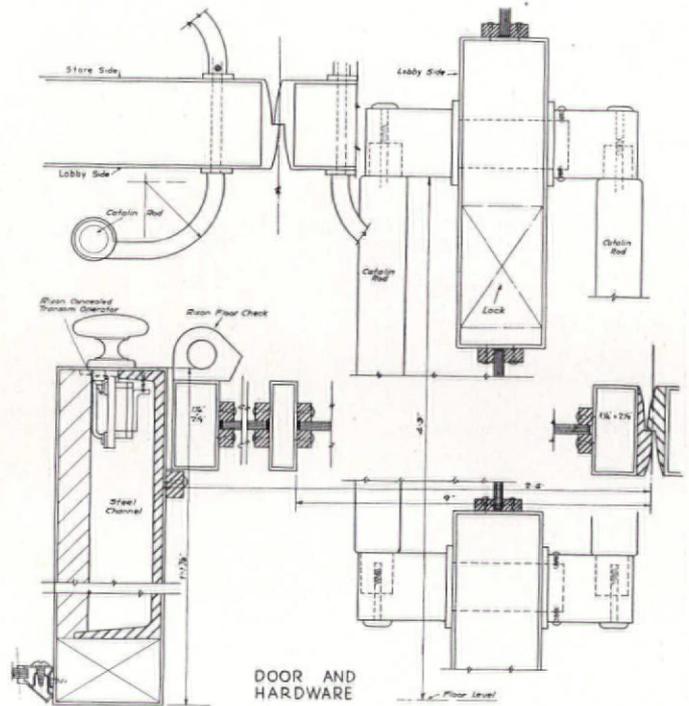
WINDOW CONSTRUCTION



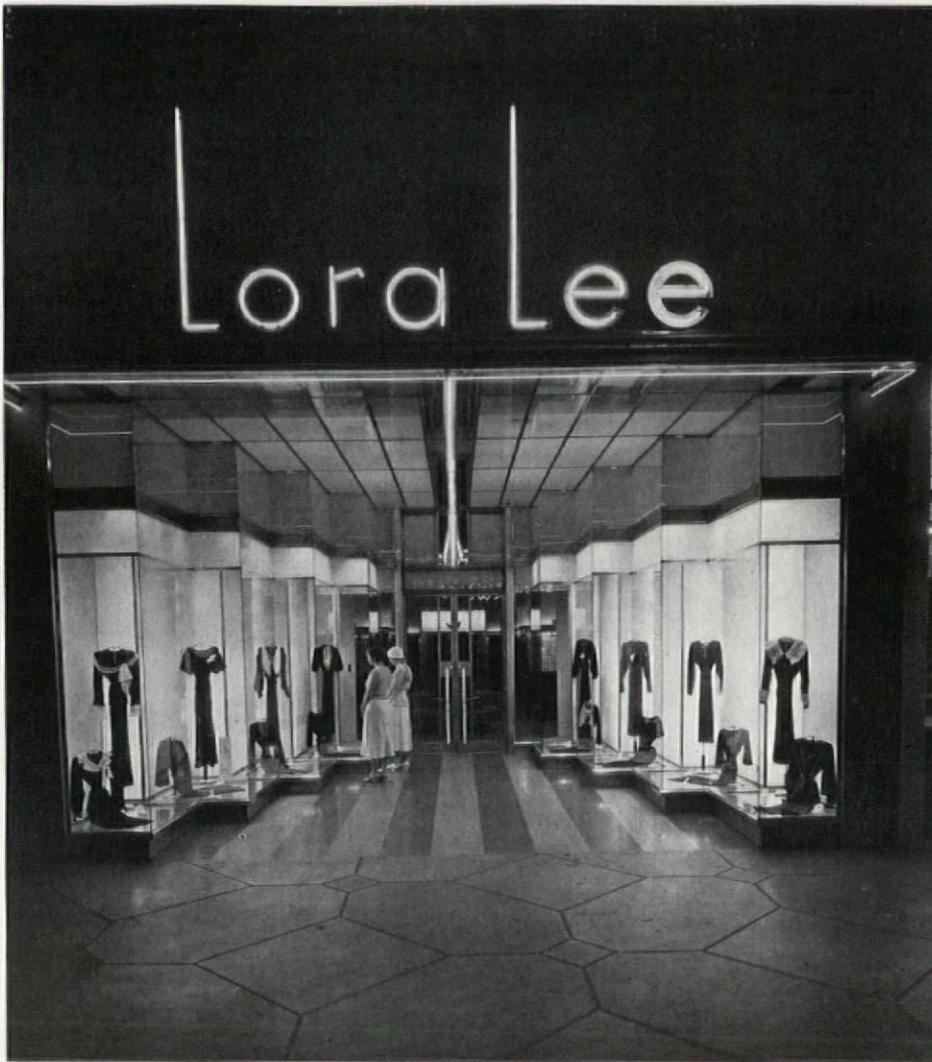
SCREEN DETAILS



SHOW WINDOW CONSTRUCTION



DOOR AND HARDWARE



Luckhaus Studio

A CHAIN STORE FOR
WOMEN'S DRESSES

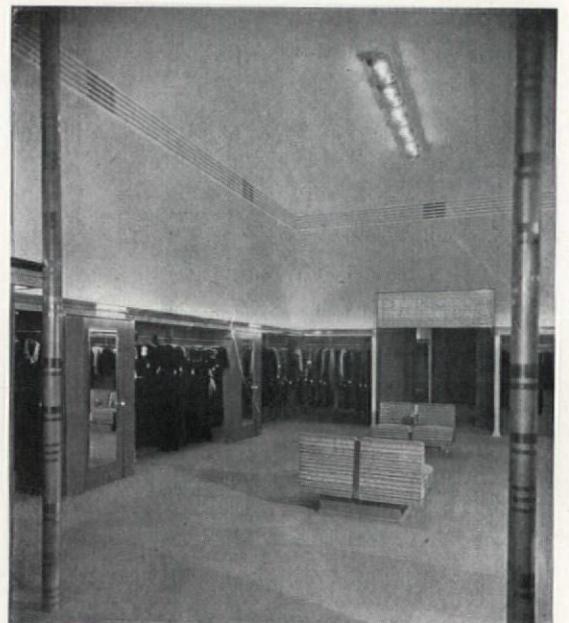
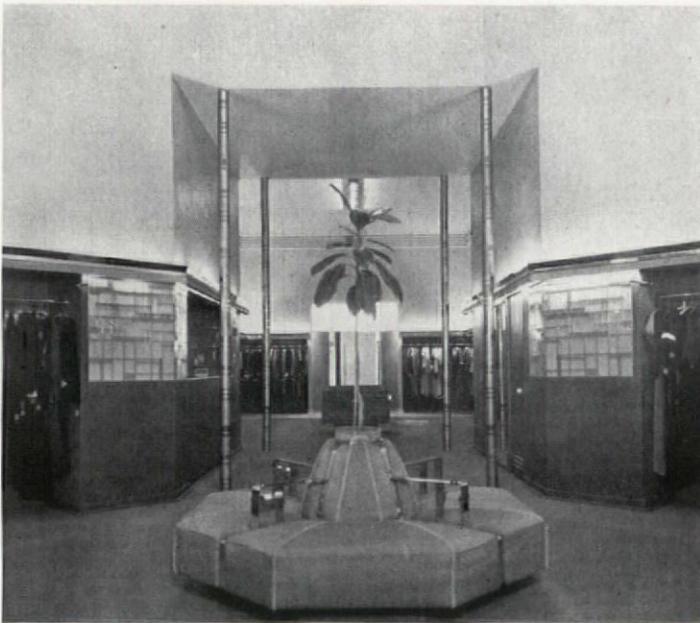
HOLLYWOOD
CALIFORNIA

J. R. DAVIDSON, DESIGNER

Show window lobby is of glass and polished aluminum. Ceiling, which projects 2 1/2 feet over the sidewalk, is of frosted glass.

Illumination is supplied by reflectors behind glass panels. The panels are fitted with very small aluminum moldings and, wherever possible, adjoining glass panes are mitered and cemented together.

White Neon tube lighting outlines the lobby ceiling and leads through the middle back toward the entrance door. The store name stands free on the canopy projection; letters are of gold leaf with gold Neon tubing.



Store interiors, showing built-in spaces for clothing displays. Color scheme; dark cinnamon floor covering and lower walls; upper walls and ceiling are of pale absinthe yellow with touches of white and coral.



HOUSING PROJECT AT BAGNEUX, A SUBURB OF PARIS
BAUDOIN AND LODS, ARCHITECTS

A NEW SYSTEM OF CONCRETE CONSTRUCTION

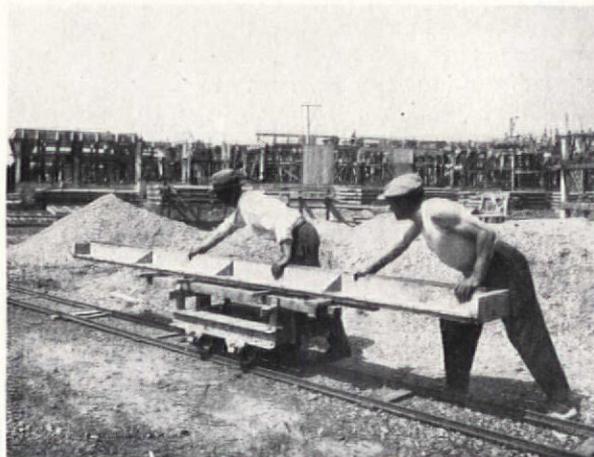
By FLETCHER PRATT

A notable development in concrete construction in Europe is the big housing project erected with the backing of the French government at Bagneux, a suburb of Paris. Intended as a working-class apartment house at low rental, it has already proved so successful that another development, more than twice as large, is already in process and more are planned for other cities as well as Paris.

In the beginning the architects, MM. Baudouin and Lods, were confronted with the difficult problem of building a huge series of structures, containing no less than 900 three- and four-room apartments, in record time, at a minimum of cost, and with a maximum of durability; and to make them fireproof if possible.

The problem was solved by building the whole immense project of pre-cast concrete members, of standardized size, including even the floors and interior walls. Only two sizes of concrete beams were used, and the constructors had nothing to do but assemble them around the steel-cage preliminary work which was erected while the concrete members were being cast.

In the performance of the job a casting plant was erected at a central point near the site for the buildings and casting was begun as soon as the ground was cleared and kept up until the project was finished. As all concrete members were standard and cast in steel molds, there was no need even of close figuring of the quantities. From the plant a diminutive railroad was run to the job. On this railroad were four-wheeled cars which could be pushed by hand if necessary, but were normally operated in fifteen- or twenty-car trains, drawn by a little gasoline engine, each car carrying one member. The concrete beams were small enough to be hoisted into position by a simple crane and winch, which was also moved from place to place along the railroad as the work progressed.



R. Picard

Typical precast concrete section being handled by car on service railroad.



Group of completed buildings at Bagneux development near Paris.

BAGNEUX DEVELOPMENT NEAR PARIS
BAUDOIN AND LODS, ARCHITECTS



Lifting precast concrete beam
into place by means of a crane.



R. Picard

Lifting precast section into position.

These photographs were taken of a preliminary section which was built entirely of concrete. This procedure was abandoned in favor of assembling concrete parts around a steel skeleton.

The concrete beams used were T-shaped, and most of them were of the same dimensions—8 feet $2\frac{1}{2}$ inches long by 1 foot wide by about 2 inches in thickness. This represented exactly the height of a story. Half-size beams were cast for the spaces under the windows. Each beam carries two reinforcing rods of three-eighths stock, which project to form keys that lock in with the steel skeleton of the structure.

A concrete mix of 1-2-4, much drier than is the custom in America, was used throughout, and before the concrete was poured into the molds it was stirred and "vibrated" on a special drum designed by the architects, with the object of eliminating air bubbles and giving a denser mix.

Two types of concrete members were cast. Those for the exterior of the building, walls and roof were coated with fine gravel while in the mold. As the mix was very dry, this gravel sank only deep enough to give a protective coating, a necessary precaution in the atmosphere of Paris, where the presence of much soft-coal smoke from inferior grades of coal has a deteriorating effect on ordinary concrete.

The beams for the interior were the same in dimensions but were cast around slender strips of wood, which later served as bearing points for the plaster and cellular concrete coating of the interior.

The exterior elements were caulked with mortar from the inside, and after being assembled and caulked, were brushed down with a point containing a small quantity of acid to remove unsightly mortar projections and give a surface to the whole. Decorative elements, also in concrete, were then run around the building at each floor level, and the trim of the balconies was carried out in the same material. This concrete, a wet mix, was sprayed on.

Inside, as outside, the beams were simply assembled in position and locked into the steel framework of the building. The ceilings were then boxed in with plaster panels, like the concrete, precast, and affixed to the wooden strips previously let in. With both outer walls and interior partitions, the same procedure was adopted inside. Panels of a cellular concrete were affixed to the base of the T-sections, giving a cellular construction to the walls that insulates the rooms from heat, cold and moisture, and making them practically soundproof. When this work was finished, all the joints were tightened with mortar as an additional protection.

The whole work was performed at the extraordinarily low cost of approximately 650 francs per square meter of floor space; which works out at about \$25 a square yard of floor space, all costs, including material, labor and overhead charges, being included in this figure. As the window casings and doors were carried out in metal throughout the buildings they also possess exceptional qualities of fire resistance.

Definitions for Air Conditioning Equipment Agreed Upon by Manufacturers:

Complete air conditioning equipment is that which provides simultaneous control of temperature, humidity, air motion, and cleaning within an inclosure throughout varying seasons. Winter air conditioning equipment provides simultaneous control of temperature, humidity, air motion and purification within an inclosure in the winter months. Summer air conditioning equipment provides for simultaneous control of temperature, humidity, air motion and purification during the summer months. All of these functions must be performed to provide related control within the limits set down in the Report of the American Society of Heating and Ventilating Engineers' Committee on Ventilating Standards.

HEATING EQUIPMENT FOR SMALL HOUSES

By THEO. F. ROCKWELL, Instructor in Heating and Ventilating, Carnegie Institute of Technology

I. SCOPE AND MARKET

This report on available heating equipment for small houses has been extended to include houses which represent a cost to the owner not to exceed \$30,000. As less than one per cent of the population of the United States can afford to own a house which costs more than \$10,000, it is obvious that this range covers practically the entire market in this country.

According to an article in *Fortune* (1) the families of the United States may be classified by their annual income in the following ways:

- I. 65 to 75 per cent have incomes less than \$2,000 a year.
 - 98.9 per cent have incomes less than \$5,000 a year.
- II. One third have incomes less than \$1,200 a year.
 - One third have incomes between \$1,200 and \$2,000 a year.
 - One third have incomes over \$2,000 a year.

Adopting the rule that a family can afford to own a home which costs twice its annual income, the market for houses can be established as follows. The lowest third of the income group can afford a house costing \$2,400 or less, the middle third one costing \$4,000 or less, and the upper third one costing from \$4,000 up.

Since the world war the building industry has intensively cultivated the market provided by the upper third of the population without apparently giving much thought to the lower groups. The market for the building industry then appears to be in supplying decent shelter for the middle third of the population, at least for the immediate future. About ten million families are included in this group.

The writers in *Fortune* (1) have set up the following as the minimum requirements for a house or apartment building to afford decent adequate shelter for an American family:

1. Healthful surrounding for building.
2. Ample supply of safe piped drinking water.

3. A modern sanitary water closet. At least one for each family.
4. Sufficient rooms and large enough to afford the members of the family necessary privacy.
5. Sunlight and gravity ventilation.
6. Dry walls.
7. Adequate garbage removal.
8. Adequate fire protection.
9. Located within reach of work.
10. Rent shall not exceed 20 per cent of annual income.

The bathtub, central heating, central lighting and the telephone are conveniences which are considered above the minimum requirements. These requirements may seem low, yet less than one half of the housing accommodations of this country meet these minimum standards of decency.

Housing programs of this nature have always met with opposition from some members of the industry who insist that most of the people in these lower groups are not capable of appreciating better living conditions if they were provided. An examination of some statistics on education may throw some light on this question. At least 60 per cent of the population have completed their grade school education, 15 per cent have graduated from high school, and 5 per cent have had some college education. Probably one half of the population is not yet fully acquainted with the proper use of modern plumbing, heating and lighting equipment, but educators feel that at least half of these people possess enough native intelligence that they can be taught to use these modern conveniences in a satisfactory manner.

Eliminating the upper 10 per cent who are at present adequately supplied and the lower 25 per cent as lacking in capacity, there are left, then, about 20 million families who are either capable of using or who can be taught to use a better grade of shelter than they are now using.

(1) *Housing: The Need. Fortune, February, 1932.*

II. AIR CONDITIONING

As the term "Air Conditioning" is bound to creep into any discussion of this question, it is necessary to establish what is meant by the term. A good definition follows: Air Conditioning is the production and maintenance of the qualities of the air as near as practicable to the ideal for the service performed. These qualities are temperature, humidity, motion, purity, odors, dust and bacteria content (2). The simultaneous control of temperature, relative humidity and air motion have been established as minimum requirements for comfort air conditioning by the American Society of Heating and Ventilating Engineers.

Because many of the devices that are sold as air conditioners lack the necessary control features and because they perform only one of the minimum functions they should be classified simply as heaters, coolers, humidifiers, and so on.

The winter function of heating is far more important to most people of this country than is the summer function of cooling. Winter air conditioning can be provided for the better class of small houses at a low enough first cost, but to realize its full advantages some structural changes are necessary. Present knowledge indicates that the relative humidity should not fall below 40 per cent for satisfactory winter air conditioning. A study of Fig. 1 shows that this relative humidity cannot be maintained without condensation on single windows after the outside temperature falls below 35° F. Most housewives object to condensation on windows, and hence the hygrostat is

adjusted to maintain a lower relative humidity. This means that the owner is not receiving full benefit from his investment in heating equipment for a large part of the heating season. Condensation can be prevented by double windows, but a satisfactory double window is not yet available. Such a window must be easy to install, present a good appearance, be easy to clean, and be sold at a reasonable price.

Summer cooling for residences is a luxury which is beyond the means of all but a small percentage of the public. The length of the season for residential cooling varies from 200 to 700 hours for most of the United States. Six cents per ton per hour may be taken as the average operating cost for the few residential cooling systems that have been reported in the literature. The total operating cost per season for a seven-room house would then range from \$24 to \$84. This represents only the operating cost which must be paid currently, and does not include the fixed and maintenance charges on an investment of \$1,000 or more in machinery operating only a few hundred hours per year.

It is known that the actual need for residential cooling can be alleviated by the use of additional insulation, especially in the roof, awnings or shades for the windows exposed to the sun, and by keeping the windows closed when the outside temperature is rising above the inside temperature. The quantitative effects of these devices are now being studied by the American Society of Heating and Ventilating Engineers.

III. TRENDS IN ARCHITECTURE

The design of a house and the quality of its construction are two factors which vitally affect the economical operation of its heating plant. Any good heating system will keep a well-built house comfortable, but no heating system will heat a poorly-built house to the occupants' satisfaction. The combination of good or medium class mechanical equipment and poor construction is decidedly bad economy.

Judging from the house plans presented in the current magazines and the experimental houses built in Chicago at "A Century of Progress," the better architects are realizing these facts. They have learned that the mechanical equipment is a definite part of the structure and that its requirements must be carefully considered in their preliminary design.*

The Committee on Fundamental Equipment of the President's Conference on Home Building and Home Ownership (3) has found that the ratio of cost of mechanical equipment to structure has been increasing in the past few years in those houses which were erected by speculative builders. The Committee attributes this to added complexity and overemphasis on nonessential equipment.†

One very noticeable trend in the planning of low-cost houses has been the elimination of the basement. This move will save from 5 to 7 per cent of the cost of the structure but it places certain restrictions on the design of the heating system. First, this design requires a heating system which will work satisfactorily with all equipment located on one floor. Forced circulation warm air, hot water systems with overhead mains, and individual stoves are types which will meet this condition. Second, the elimination of the basement removes a satisfactory place for the storage of solid fuel with the possible exception of anthracite coal. This presents a serious objection to this type of design, because most of the people can only afford to burn coal or wood.

(2) R. E. Waterfill, *Carrier Corp. Railway Age*, 1931.

(3) *House Design, Construction and Equipment, Volume V.*

*Locating kitchens and bathrooms on opposite sides of a partition wall, placing them towards the side of the lot nearest the utility connections, and the careful use of insulation are elements of architectural design which result in lower installation costs for mechanical equipment.

†It is my opinion that the advocates of prefabricated houses as the solution of the low-cost housing problem have defeated their purpose by overloading their trial houses with plumbing, heating and electrical equipment. One-half to two-thirds of this expenditure could be eliminated because it definitely represents luxuries to the class of people these designers are trying to help.

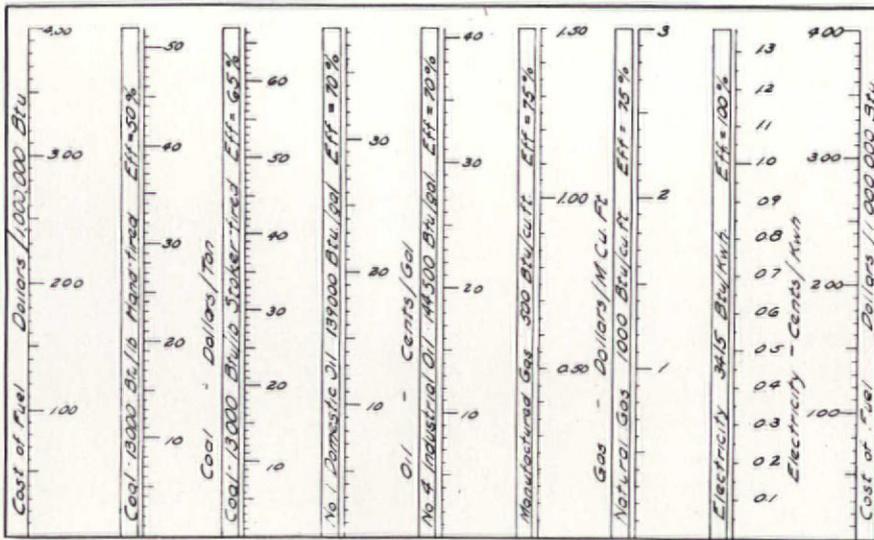


Figure 2—Chart for comparing fuel costs. Note: Costs of oil and stoker coal must be adjusted for cost of power required by burner and stoker.

IV. AVAILABLE EQUIPMENT FOR VARIOUS INCOME GROUPS*

A survey of small-house plans and the report of the Division of Building and Housing of U.S. Department of Commerce (3) indicates that various sized houses will have approximately the heat losses shown in Table I. A temperature difference of 70°F is assumed.

TABLE I

Cost of House	Type	Vol. of Heated Space Cu. Ft.	Probable Heat Loss B.t.u./hr.		Recommended Maximum Expenditure
			Uninsulated	Insulated	
\$3,000	Bungalow	5,600	50,000	37,000	\$300
5,000	"	6,400	60,000	40,000	500
7,000	Two-story	7,500	60,000	40,000	700
8,500	"	8,300	64,000	50,000	850
10,000	"	10,100	92,000	66,000	1,000
15,000	"	14,400	105,000	75,000	1,500
20,000	"	20,000	120,000	85,000	2,000
30,000	"	28,000	166,000	120,000	3,000

The Committee on Design of the President's Conference (3) found that the cost of constructing small detached houses was as follows:

Structure and interior finish.....65 to 75 per cent
 Plumbing, heating, wiring.....20 to 30 per cent
 Kitchen equipment and decoration... 7 to 12 per cent

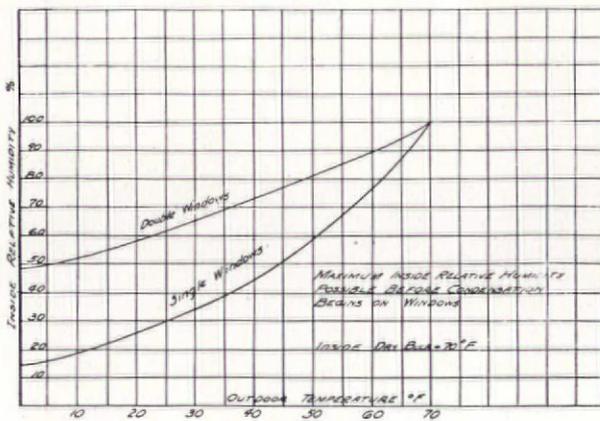


Figure 1—A relative humidity of 40 per cent cannot be maintained without moisture condensation on single windows after outside temperature falls below 35°F.

The Committee on Fundamental Equipment of the same conference reports cases where as high as 15 per cent of the total cost was spent on heating plants for houses costing as low as \$2,000. However, the Committee feels that heating plants, costing more than 10 per cent of the total cost of the house, represent expenditures which are out of proportion to the normal budget. The allowable expenditure for heating plants shown in Table I was determined on this basis.

The first governing factor to be settled in the selection of the type of heating system is which fuel shall be used. Wood, coal in its various grades, coke, oil and gas are the common fuels available for domestic heating. The following conditions govern the selection of a particular fuel:

- Price of fuel delivered.
- Continuity of supply.
- First cost of fuel-burning device.
- Depreciation, interest and maintenance charges for fuel-burning equipment.
- Cost of energy for operating device.
- Disposal of ash.
- Value placed by owner on his own labor.

The chart in Fig. II provides a quick means of comparing fuel costs on the basis of useful heat delivered at the boiler nozzle or furnace bonnet. For example, if 80 cents per million B.t.u. is the maximum allowable charge for fuel, then coal for hand firing must cost less than \$10.25/ton†, No. 4 oil less than \$.08/gal., natural gas less than \$.60/M. cu. ft. and electricity \$.0027/kw.-hr.

Wood and coal are the cheapest fuels in most parts of the country when all items of cost are considered. These fuels have the following disadvantages:

*See Appendix III.
 †For coals other than 13,000 B.t.u./lb. multiply cost of 13,000 B.t.u. coal by direct ratio of heating values to find price of other coal; eg, coal at 10,500 B.t.u./lb. must sell for

$$\frac{10,500}{13} \times 10.25 = \$8.25/\text{ton}$$

to produce same cost for heat.

- a. Dirtiness.
- b. Large storage space required.
- c. Poor temperature control and efficiency with hand firing.
- d. Considerable labor required.

For most families in the lower income groups the advantage of low price will be sufficient to overcome the disadvantages.

Oil and gas are considered as the automatic fuels. The choice between the two should be decided by the ultimate cost of heat. Gas (in built-up districts) does not require any storage facilities. Oil must be stored on the premises, but the storage tank may be placed outside the house.

In many localities stoker-fired coal can compete successfully with oil and gas to provide the convenience of automatic heating*. Stokers will burn fines and the poorer grades of coal which sell at rates lower than the lump coal for hand firing.

It is better practice when oil or stoker-fired coal is used for air conditioning systems to introduce a boiler and heat exchanger. The noise caused by the operating of the burner or stoker is not transmitted through the duct system.

The characteristics of anthracite coal make it adaptable for use in automatic and semi-automatic fuel-burning devices. The Anthracite Institute has engaged in considerable development work along these lines in order to widen the market for anthracite coal.

One of these devices is the magazine boiler. The storage space is large enough to hold two or three days' fuel supply. This, of course, is not an automatic fuel-burning device; but it greatly reduces the frequency of attention. Stokers, similar in appearance to those burning bituminous coal, have also been developed for anthracite coal.

Their latest achievement is an automatic heat machine which has been exhibited at a "Century of Progress." It is a heavily insulated boiler equipped with a motor operated grate. Coal is carried underneath the basement floor from the bunker by a screw conveyor. It is forced up through the center of the fire, and the motion of the grates results in even distribution over the fuel bed. The ash falls off the edge of the grates into another screw conveyor, which deposits it in a conveniently located ash receiver. The only labor required is the disposal of the ash once or twice during the heating season. The entire machine is placed under thermostatic control.

The sponsors claim an efficiency of 78 per cent on the test floor.

A new house has recently been equipped with an experimental automatic anthracite boiler of somewhat different design.† In this case the coal is fed by gravity from an overhead bunker, but the motor operated grate and ash-handling device are included. The unit is designed for year-round operation, supplying heat in winter and cooling, through the means of an absorption refrigeration system, in summer. It also heats the domestic water supply, and produces the refrigerating effect



Heaterange, manufactured by Jeddo-Highland Coal Company, combines the kitchen range, domestic hot-water heating and house heating in one piece of equipment.

for the kitchen refrigerator.

The market for these devices is limited to those territories where anthracite is available at prices competitive with oil or gas.

After the fuel question is settled, the type of heating system may be determined. The following combinations of equipment are suggested for the various classes of houses:

Group No. 1

Houses costing \$3,000 or less.
Heated space approximately 5,600 cu. ft.
Heat loss 37,000 to 50,000 B.t.u./hr.
Fuel—hand-fired coal.
Maximum expenditure—\$300.

Plan 1. No basement.

Convactor heater placed in living room**
Estimated cost, \$50 to \$70

Plan 2. No basement.

Hot-water system with overhead supply main, open expansion tank and small specially-designed hot-water boiler. Boiler is placed in kitchen and serves as radiator for that roof.††

Estimated cost, \$210 to \$230

Plan 3. No basement.

For homes built in anthracite coal regions.

A fuel-burning device recently placed on the market combines the kitchen range, domestic hot-water heating and house heating in one piece of

*I do not recommend the installation of oil or gas conversion burners in boilers designed for hand-fired coal unless the coal boiler is oversize and the installation is made under the supervision of a competent combustion engineer.

†Merion, Pa. The Philadelphia and Reading Coal & Iron Co. is the sponsor.

**Sold by American Radiator Co.—Sears Roebuck Co. et. al.

††Manufacturers: American Radiator Co., National Radiator Co. et al.

equipment.* It is designed for burning anthracite coal. Air from the rooms is drawn through the return duct, passed over a heat exchanger and discharged through registers into the heated spaces. A small electrically-driven blower provides the circulating force. The blower also supplies forced draft. It is claimed that the range is well enough insulated to prevent overheating the kitchen in summer.

Estimated cost	
Heaterange	\$195
Electric wiring	35
Sheet metal	100
	\$330

This amount exceeds the recommended expenditure for this class of house, but the fact that one fuel-burning device is substituted for three will in some cases justify its use.

Its consumption of electrical energy is a handicap where low-cost heating is the problem. Assuming 2,500 hours of operation during a heating season and a motor efficiency of 85 per cent, the 1/6 hp. motor will consume 370 kw.-hr. a year. Its field is therefore limited to regions where both anthracite coal and electrical energy may be purchased at very low rates.

Plan 4. Basement.
Pipeless warm-air furnace.
Estimated cost, \$120 to \$150

Plan 5. Basement.
Piped warm-air furnace.
Estimated cost, \$200 to \$225

Group No. 2

Houses costing \$3,000 to \$5,000.
Heated space approximately 6,400 cu. ft.
Heat loss 40,000 to 60,000 B.t.u./hr.
Fuel—hand-fired coal.
Maximum expenditure—\$500.

Plan 1. No basement.
Same as Plan 1, Group 1.
Estimated cost, \$60 to \$90

Plan 2. No basement.
Same as Plan 2, Group 1.
Estimated cost, \$260 to \$280

Plan 3. No basement.
Same as Plan 3, Group 1.† Estimated cost \$340

Plan 4. Basement.
Same as Plan 4, Group 1.
Estimated cost, \$150 to \$175

Plan 5. Basement.
Same as Plan 5, Group 1.
Estimated cost, \$275 to \$325

Plan 6. Basement.
Two-pipe hot-water system.
Estimated cost**, \$300 to \$350

*Manufactured by Jeddo-Highland Coal Co., Jeddo, Pa.
†60,000 B.t.u./hr. is maximum heat loss for this unit.
**Sears-Roebuck Co. estimate.
††Contractor's bid on two-pipe hot water will be approximately the same.

Plan 7. Basement.
One-pipe steam system.
Estimated cost, \$400 to \$500

Plan 8. Basement.
House insulated to reduce heat loss to 45,000 B.t.u./hr. or less. Two-piece steam system.††
Estimated cost, \$440 to \$470

Group No. 3

Houses costing \$7,000.
Heated space approximately 7,500 cu. ft.
Heat loss 40,000 to 60,000 B.t.u./hr.
Maximum expenditure—\$700.
Fuel—hand-fired coal, oil or gas.

Note 1: Sufficient money is now available to provide for the installation of gas or oil-burning equipment, especially if the house be insulated. In some parts of the country the rates for these fuels when compared to coal will be low enough to permit home owners in this class to use one of them; however, there should be a very decided price advantage before an engineer or architect should recommend their use in this class of house.

Note 2: \$7,000 permits the construction of a two-story house which provides more floor space without materially increasing the heat losses.

Note 3: The prices quoted for oil and gas equipment include the proper control devices which should always be installed when these fuels are used.

Plan 1. Basement.
Coal-fired gravity warm-air system.
Estimated cost, \$300 to \$350
Alternate A. Gas-fired gravity warm-air system.
Add \$250

Alternate B. Forced circulation system with fan, filter and humidifier (hand-fired coal)
Add \$125 to \$150

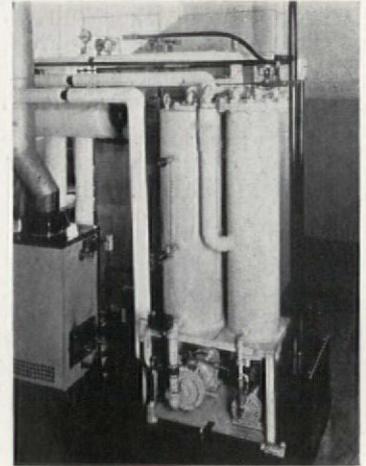
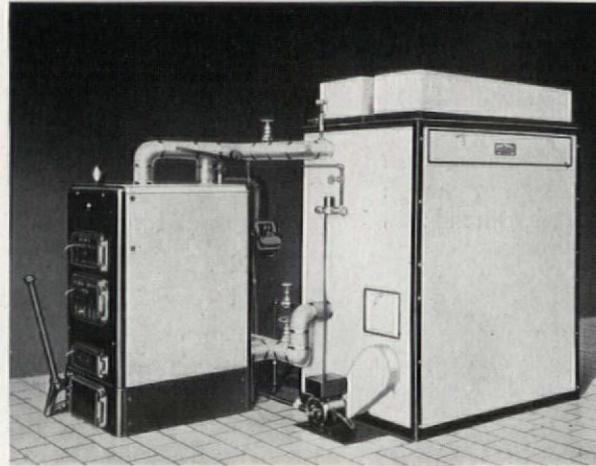
Note 4: The forced circulation system may be used when no basement is provided.

Note 5: A forced circulation system in this case means merely the addition of the fan and filter unit to a high-class gravity circulation warm-air furnace. It does not mean the installation of made-to-order sheet metal work.

Plan 2. Basement.
Coal-fired two-pipe vapor system.
Estimated cost, \$430 to \$550
Alternate A. Gas-fired boiler.
Add \$100 to \$125
Alternate B. Oil-fired boiler plus tank.
Add \$275 to \$350

Plan 3. With or without basement.
Two-pipe hot-water system.
Price ranges same as for Plan 2.
Option—For thermostatic damper control on hand-fired coal systems, add \$75.

American Blower Corporation equipment—a series "R" Sirocco Conditioner installation; and (right) a vertical Ross Decalorator used in conjunction with a Sirocco Conditioner and an American Gas Product Co. Boiler.



Group No. 4

Houses costing \$10,000.

Heated space approximately 10,100 cu. ft.

Heat loss 66,000 to 92,000 B.t.u./hr.

Maximum expenditure—\$1,000.

Fuel—coal, oil or gas.

Note 1: Automatic stokers are priced low enough to come within the limits of first cost, but some difficulty has been encountered in jobs where the heat loss is less than 100,000 B.t.u./hr. because the fire is apt to go out during mild weather. This trouble is now being eliminated by the use of a special control which starts the stoker when the stack gas temperature falls too low. The stoker runs about five minutes and the cycle repeats about once every hour or two during mild weather.

Plan 1.

Hand-fired coal forced circulation warm-air system. Estimated cost, \$600 to \$700

Alternate: Gas firing. Add \$250 to \$300

Plan 2.

Two-pipe vapor system, hand-fired coal. Estimated cost, \$620 to \$840

Alternate A. Stoker-fired coal. Add \$450

Alternate B. Oil burner and tank. Add \$350

Alternate C. Gas-fired boiler. Add \$225

Plan 3.

Two-pipe hot-water system. Prices approximately the same as for Plan 2.

Group No. 5

Houses costing \$20,000.

Heated space 20,000 cu. ft.

Heat loss 85,000 to 120,000 B.t.u./hr.

Maximum expenditure—\$2,000.

Fuel—Coal, oil or gas.

Plan 1.

Air conditioning system—hand-fired coal. (*Heating only*)

The estimated cost is made up from the following items:

1. Air conditioning units* (heat exchanger, fan, filter and humidifier in casing plus control equipment) in place\$690
 2. Coal-fired boiler in place..... 190
 3. Duct system with outside air intake and dampers in place..... 700
- \$1580

Note 1: At present the sheet metal work is the greatest variable in the cost of this type of system. Stock duct sizes for gravity warm-air work are used, lightweight metal is used, and the work may be skimmed in other ways. A good system requires that the duct work be made to order. Proposals for this type of work have ranged from \$250 to \$1,000. The market for residence air conditioning could be widened by the development of standard duct parts in a reasonable number of sizes.

Alternate A. Stoker-fired coal.

Add \$500

Alternate B. Oil burner and tank.

Add \$400

Alternate C. Gas-fired boiler.

Add \$300

Alternate D. Direct gas-fired air conditioning system. Estimated cost† \$1,500 to \$2,000

Plans 2 and 3.

Two-pipe vapor or hot-water, hand-fired coal. Estimated cost \$800 to \$1,100

Alternatives for other fuels, same as Plan 1.

Plan 1 C.

Addition of cooling equipment for cooling entire house to Plan 1.

These prices would not be much lower for smaller houses. A reduction in first cost can be accomplished by limiting the cooling to one or two rooms.

*American Blower Co. Sirocco Type R.

†Carrier Weathermaker. For cooling add \$1,000 to \$1,500.

Alternate A. Cooling by ice. Ice tank and chilled water pump in place.

Estimated cost \$350 to \$400

Alternate B. Steam ejector cooling.

Ejector*	\$500	
Pumps	150	\$650

Alternate C. Electrically-driven compressor.

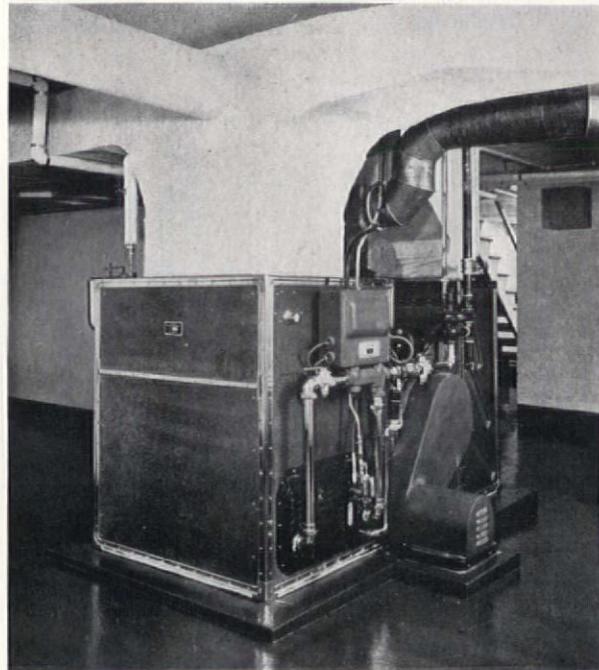
2-ton compressor	\$480	
Chilled water pump	75	
Chilled water tank and evaporator coil	100	\$655

Group No. 6

Houses costing \$25,000 or more.

Home builders in this class are not so strictly limited in their allowable expenditures, and the additional comforts resulting from more complex mechanical equipment are permissible. Improved construction to reduce heat losses permits smaller heating plants. This makes more money available to indulge in refinements, such as individual room temperature control and mechanical cooling.

The advantages and disadvantages of the various systems just mentioned are given in the following lists.



Commercial Photographic Corp.

A central plant type air conditioning system for a residence. Cooling can be applied in summer. Carrier Corporation.

ADVANTAGES AND DISADVANTAGES OF VARIOUS TYPES OF RESIDENCE HEATING SYSTEMS†

I. Individual stoves or specially-designed room heaters.

Advantages:

1. Low first cost.
2. No basement required.

Disadvantages:

1. Appearance.
2. Dirty.
3. Poor temperature distribution and control.
4. Room space required.
5. Dangerous for small children.

II. Gravity—circulation warm-air systems.

A. Piped system.

Advantages:

1. Low first cost.
2. Better air conditions result from circulation.
3. Quick response to temperature changes.
4. No overheating in mild weather.
5. Humidification made easier.

6. Registers require very little space in living portion of house.
7. No danger due to freezing or loss of water.
8. No valves, traps, etc. to service.

Disadvantages:

1. Limited to small houses with compact floor plans. Dimensions should not exceed 40' by 50'.
2. Large amount of space required in basement.
3. Location of return air register interferes with placing of furniture and rugs.
4. Location of warm-air stacks to second floor is often difficult.
5. Air circulation promotes movement of dust particles.** Poor workmanship accentuates the dust problem.
6. Badly exposed rooms require special treatment as extra insulation, weather-stripping, larger leaders.

B. Pipeless Furnace. (Compared to Piped Furnace).

Advantages:

1. Lower first cost.

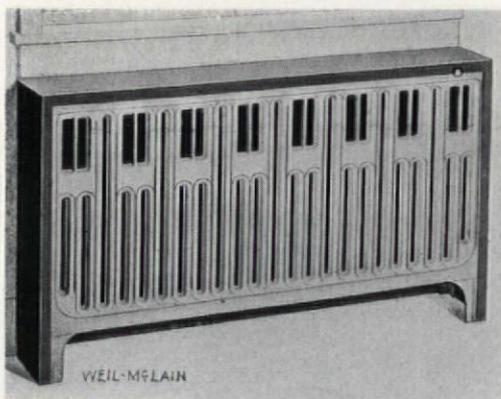
Disadvantages:

1. Limited to very small houses.
2. Wide range of air temperatures.
3. Requires large floor register centrally located.

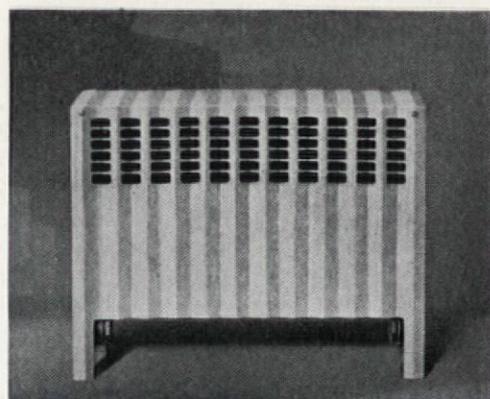
*Ross Decalorator—American Blower Co.

†These advantages and disadvantages are based on the assumption that all systems are selected and erected by qualified engineers and mechanics. Any heating system possesses other potential dangers and disadvantages when installed under the direction of incompetent persons.

**Very low cost filters are now available for gravity warm-air furnaces which do not interfere with the operation of well-designed systems. Filters are renewed once each year at a cost of \$6 to \$10. Manufactured by Owens-Illinois Glass Co. Trade name: Dustop.



Two radiators which combine the advantages of radiated and convected heat in a single unit: (left) "Raydiant Concealed Radiator," Weil-McLain Co.; (right) "Richvar Radiator," Richmond Radiator Co.



III. One-pipe steam system.

Advantages:

1. Lowest cost of the radiator heating systems, but higher than gravity warm air.

Disadvantages:

1. Noisy circulation during heating-up period.
2. Operation of radiator air valves produces disturbing noise.
3. Poor temperature control, frequent overheating especially in mild weather.
4. Air valves require frequent replacement.
5. Air vented into rooms possesses disagreeable odor.

IV. Two-pipe vapor system.

Advantages:

1. Quiet circulation.
2. No odor in living space.
3. Responsive to temperature control.
4. Well adapted to mild weather because of subatmospheric steam in radiators.

Disadvantages:

1. High cost.
2. Traps and specialties require some servicing.

V. Steam vs. Hot Water.

1. The cost of a two-pipe steam system is equal to the cost of a two-pipe hot-water system.
2. Steam systems are more responsive to automatic temperature control. (Quick outside temperature changes.)
3. Steam systems are more subject to corrosion.
4. Hot-water systems are less apt to over-heat in spring and fall.
5. Lower temperatures at radiators in hot-water systems produce slightly better heating effects.
6. Hot-water systems require larger radiators.
7. Hot-water systems are subject to freezing which may cause considerable damage.

8. Except for freezing, the hot-water system is more foolproof.
9. Both systems require proper facilities for venting.

VI. Direct cast-iron radiators vs. concealed or convector heaters. (Ferrous and nonferrous.)

1. Neither type appears to possess any distinct advantage over the other with regard to fuel consumption.
2. A heater (ferrous or nonferrous) placed in a well-designed inclosure tends to produce a better heating effect in the occupied zone (30' above floor) than does the bare radiator.*
3. Covering a radiator reduces the amount of dirt deposited on curtains or walls. It also reduces the heat output of the radiator.
4. Dividing the required amount of surface into a number of small units improves the temperature distribution. It also increases the first cost.
5. Cast-iron convector heaters are more rugged and less subject to corrosion. Nonferrous convector heaters possess the advantage of low weight.
6. The difference in thermal conductivity of the several metals is *not* a controlling factor.
7. The choice should be governed by
 - a. Appearance.
 - b. Space available.
 - c. Net cost in place.

VII. Forced Circulation Warm-Air System (Air Conditioning).

Advantages:

1. Positive circulation produces good air condition in living space.
2. Small grilles do not interfere with decoration of room or location of furniture.
3. Quick response to sudden temperature changes.
4. Good automatic temperature control.

*Some manufacturers are attempting to combine the advantages of radiated and convected heat into one unit.

1. Richmond Radiator Co.—"Richvar" Radiator.
2. Weil-McLain Co.—Raydiant Concealed Radiator.

5. Quiet.
6. Use of good filters makes this the cleanest type of heating system.
7. Good humidification.
8. Cooling equipment easily installed at future date.
9. In most localities good cooling effect is accomplished by circulation of air through system. An outside air connection may be provided and air drawn in from outside after sun sets.

Disadvantages:

1. Expensive installation costs; high fixed charges.
2. Power for motors increases operating cost.
3. Requires better care.

VIII. General.

1. All other things being equal, the heat-carrying medium, whether it be steam, water or air, should have but little effect on the amount of fuel consumed. Under this condition fuel economy results from intelligent handling of the

V. HUMIDIFIERS

Extensive advertising is making the American home owner "humidity conscious," and as a result, the market is flooded with all sorts of devices for humidifying homes. Some of these are worthwhile, but more of them are not.

The all important fact that heat is necessary to evaporate the water seems to be ignored by many of these promoters, and only a few apparently realize what quantity of water must be evaporated to produce good conditions. Six and one half gallons of water, requiring 56,000 B.t.u., must be evaporated in 24 hours in order to maintain a relative humidity of 45 per cent at 70° F in a house with 5,600 cu. ft. of heated space when the outside conditions are 20° F and 75 per cent relative humidity and infiltration takes place at one air change per hour. Ten gallons would be required in a house with 8,500 cu. ft. of heated space. While small pans of water placed on the radiator or register may help, not nearly enough water will be evaporated by these methods.

Humidifiers for residences may be roughly divided into two classes:

- a. Spray type.
- b. Surface evaporator.

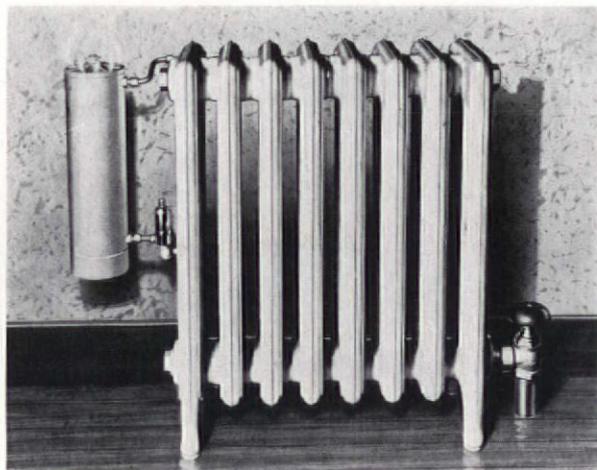
In the first type the spray is produced either by the city water pressure or a small circulating pump. In one case, water is wasted, and in the other, power to operate the pump is required. The spray is usually directed into a moving air stream and rapid evaporation results. Water is heated in shallow pans in the second type, which depends on a relatively large free surface area for sufficient evaporation.

equipment by the operator. Without thermostatic control, warm-air systems are less subject to overheating than water or steam systems.

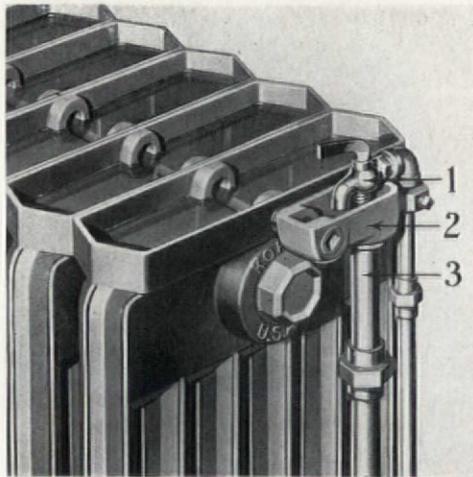
2. In most cases it is not economically feasible to condition all rooms of a house. Kitchens, bathrooms, and garages fall in this class and these rooms are often better heated by radiators. A split-system is, therefore, desirable in many instances.
3. In residence air conditioning systems, it is advantageous to use heat exchangers in the duct system rather than passing the conditioned air through the fuel-burning device.
 - a. When water is used, the same coils or heat exchangers may be used for both heating and cooling.
 - b. Other types of systems will require an additional coil for the cooling function.
 - c. This type of design permits installation of split system.
 - d. It permits the use of any kind of fuel.

Warm-air systems (either gravity or forced circulation) lend themselves most readily to humidification, and both types of humidifiers are being used in warm-air heating. The evaporating pan appears to be the more popular because its first cost and operating cost are both lower. The best location for the pan is on top of the furnace radiator in the path of the heated air.

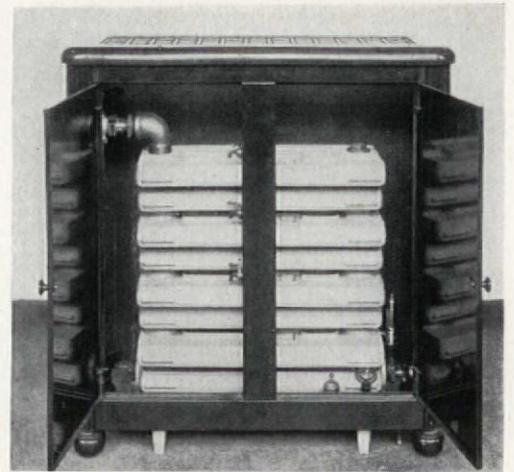
These pans are being built into nearly all the better grades of warm-air furnaces at only a slight increase in cost, and are within the range of all builders that can use warm-air heating. A float



A spray-type humidifier, manufactured by American Radiator Company, which can be attached to individual radiators.

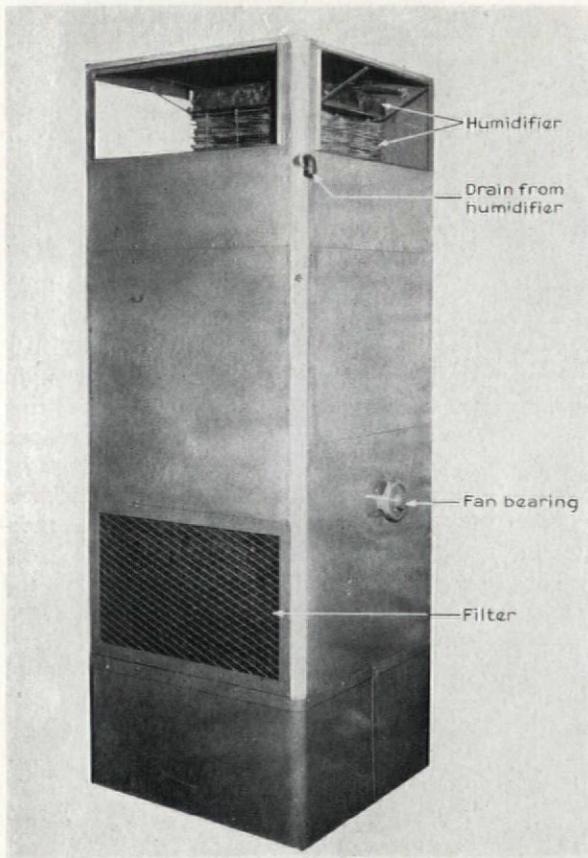


(Left) Close-up of Kohler "Humidifier," showing (1) drip valve control, (2) supply cup, and (3) adjustable overflow pipe.

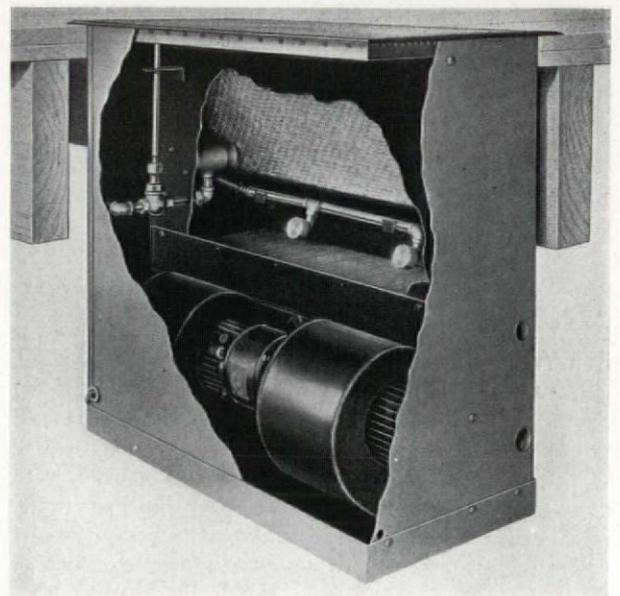


(Right) Humidifier radiator manufactured by Crane Company.

Kohler of Kohler



Humidifier
 Drain from humidifier
 Fan bearing
 Filter



Schill Studio

(Above) Cutaway view of Carrier Home Humidifier.

(Left) View of General Electric Air Conditioner, showing humidifying equipment.

valve is provided so as to maintain sufficient water in the pan. Because this type is to some extent self limiting, no hygrostat is necessary, which helps keep the cost down.

Water pans built into the sides of furnaces are not very effective.

To provide humidification for homes heated by radiators, several types of humidifying radiators have been introduced.* The unit is intended to replace one of the existing radiators and is supplied with steam or hot water as the case may be. Humidification is accomplished by allowing a small stream of water to trickle down a heated cast-iron runway. This type has several disadvantages and

must be carefully located if satisfactory results are to be obtained at all. The distribution is not as good as with a warm-air system; and if the unit is located on an outside wall, condensation is apt to occur on the adjacent cold wall surfaces.

Spray-type humidifiers are also available for radiator heated houses.† A spray nozzle and a small steam coil are placed inside a finished metal cabinet, which is provided with inlet and outlet grilles. A few types depend upon gravity circulation, but most of them are equipped with

*Crane Co., Kohler Co., American Radiator Co.

†Lewis Air Conditioner, Inc., Minneapolis.; Carrier Co., General Electric Co., American Blower Co., et al.

motor-driven fans to insure good distribution of the moist air. This type requires automatic control to prevent overhumidification. The hygrostat generally controls a solenoid valve in the water supply line.

These units cost from \$125 up in place, which places them beyond the reach of the lower-income groups.

Room humidifiers with electric heating elements are also on the market. The prices range from \$15 to \$30 depending on their appearance, but the operating cost is out of line with the results produced.

VI. MECHANICAL VENTILATION

The natural leakage of air through cracks around windows and doors supplies more than enough oxygen for any reasonable occupancy of a small residence. Mechanically induced ventilation is desirable in residences for other reasons, such as the removal of odors and prevention of overheating.

Odors originate in kitchens and bathrooms. Small disk or propeller-type fans are available for installation in the outside walls of these rooms* The prices range from \$40 up. The variation in price is caused by power characteristics, quality of finish and workmanship, refinement of speed control and size.

The lower-priced units are effective in preventing the spread of odors through the rest of the house, but the volume of air handled is too small to accomplish any worthwhile temperature reduction. Exhaust fans large enough to produce a worthwhile cooling effect cost from \$200 up installed.† They may be installed in the attic space with the stair hall or a grille through the top floor ceiling serving as the inlet.

These exhaust fans could be installed in houses costing \$7,000 or more without unduly unbalancing the builder's budget. This price does not include any control other than a remote start and stop switch, which is all that is necessary. After sunset on hot days, the operator starts the fan and allows it to run until sufficient cooler outside air has been drawn in through open windows to effect more comfortable conditions.

Some good results could, no doubt, be accomplished by a gravity exhaust system; but this method has some bad faults. The induced ventilation is least when it is most needed, the space required is a serious drawback in the small home, and the roof ventilator does not fit in with residence architecture.

Such mechanical exhausters or gravity duct systems are desirable; but in detached or row houses they represent an expenditure which is not essential

*B. F. Sturtevant Co.; American Blower Co.; Ilg Electric Ventilating Co.; Propellair, Inc.; Buffalo Forge Co.; L. J. Wing Mfg. Co.; et al.

†American Blower Co.; Ilg Electric Ventilating Co.; Propellair, Inc.; Buffalo Forge Co.; L. J. Wing Mfg. Co.; B. F. Sturtevant Co.; et al.

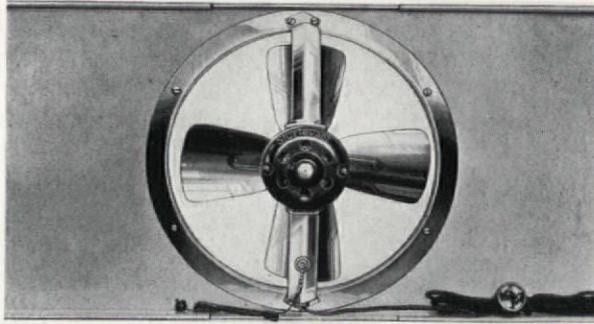


Chicago Architectural Photographing Co.

Built-in model of Ilgair Kitchen Ventilator for removal of odors.



Typical propeller type fan installation for kitchen. American Blower Co.



(Above) Small residential propeller fan manufactured by B. F. Sturtevant Co.

(Right) 8-inch "Home Vent" unit installed in apartment kitchen. Buffalo Forge Co.



and should not be included at the sacrifice of basic structural quality.

Multi-story dwellings present a different problem. In this case something must be done to prevent one tenant's cooling odors from becoming a nuisance to his neighbors. Most building codes require that mechanical exhausting systems be installed in this type of structure.

VII. ROW HOUSES

In the search for the answer to the problem of low-cost housing, considerable attention has been given to row houses. In cities where unimproved land costs more than 25c/sq. ft., a family, which cannot afford more than \$7,000 for a house, will receive far better shelter in a row house than in any type of detached house. The difference in building costs clearly shows the advantage in favor of the row house (3).

Building costs only:

Inside row house, \$5.07/sq. ft. of usable floor area.

Detached single house, \$6.28/sq. ft. of usable floor area.

This comparison applies only to the well-designed broad-front row house.

It appears that to get good results economically, architecturally and civically with row houses, the project must be large enough to house a hundred or more families. In a development of this kind there are several good reasons for the elimination of through streets, but this elimination handicaps the heating problem.

Separate heating systems burning hand-fired coal is one answer to the problem. In most cities, coal is the fuel that people in this class could best afford when it must be burned in individual units. But in a community such as this, the delivery of coal and the removal of ashes present a serious problem. The smoke nuisance in a closely-built section, which

*The General Electric and the Electrol-Kewanee are good examples.

would result from the many fires cared for by unskilled firemen, is also a great disadvantage of this method of heating.

Individual gas-fired units could be installed, but in most cases they would have to be ruled out on account of expense.

A district heating plant would eliminate the fuel handling problem, but there are several drawbacks to this plan. A light heating load is scattered over a wide area, which makes the distribution cost high. The cost of the boiler house, boilers, stokers, pumps, draft fans, and so on, required by the large central plant increases slightly faster than the cost of individual units. The large plant would also require that one or more licensed firemen be on duty at all times during the day or night. In most cases these high fixed charges are greater than any saving which may come from increased combustion efficiency.

The following compromise plan seems to offer possibilities in overcoming objections to the previous plans. The houses could be divided into groups of five to eight houses each, with the total heat loss averaging about 220,000 B.t.u./hr. Steam for all houses in the group could be supplied from one oil-fired boiler operating under full automatic control. Sufficient space for the boiler could be taken from the basement of one of the houses. The boiler room would be of fireproof construction and have only an outside door. Oil-burning boilers* are now available in which all working parts are entirely sealed and which require no at-

tention other than to maintain the supply of fuel oil. Splitting the houses up into these small groups would keep most of the pipe sizes smaller than 2½"* and would eliminate the necessity for condensation or vacuum return pumps.†

Different families will not agree on one inside temperature as being the most desirable. To take care of this condition, the burner should be controlled by a pressure-stat in place of a thermostat. A constant steam pressure will be maintained in the supply mains, and each tenant can exercise sufficient temperature control by adjusting his radiator valve. For an additional expenditure of about \$15 per radiator a thermostatic radiator valve** may be installed, which will improve the quality of the temperature control.

A study of material prices indicates that the initial cost for a group system (5 to 8 houses) will not be more than \$150 greater for a two-pipe vapor system than for one-pipe steam systems with individual gas-fired boilers.†† The increased investment is not much in a project of this kind, and the occupant has the benefit of a superior heating system accompanied by a smaller fuel bill (included in the rent). In case the fuel prices favor gas, a single gas-fired boiler can be used.

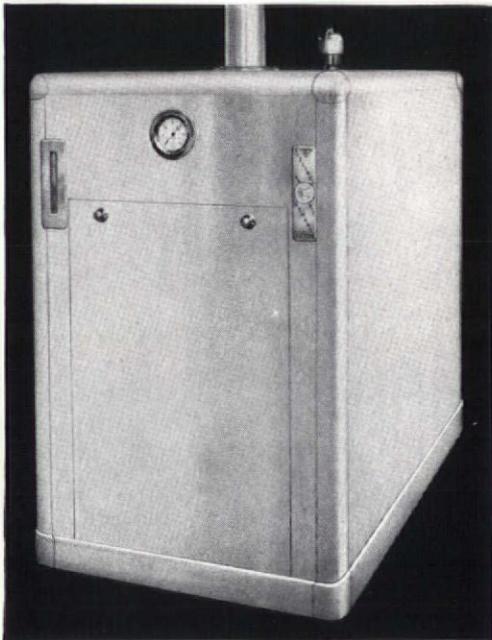
Some repair and service men are required around a large housing development in any case, and the maintenance charges for either system should be the same. Stoker-fired coal is not recommended because of the additional labor charge.

*The cost of pipe and fittings for sizes above 2½" increases rapidly.

†Alternating return traps should be installed.

**Minneapolis Honeywell—Modustat; American Radiator Co. Arcotherm; Warren Webster Co.; et. al.

††This comparison is based on the buildings erected in the Buhl Foundation's Chatham Village, Pittsburgh. See Appendix.



Electrol-Kewanee Heating Unit.

VIII. SUMMARY

1. Low initial cost for the mechanical equipment of residences (plumbing, heating, lighting) begins on the architect's drafting board, and is followed by the selection of the equipment under the direction of a competent mechanical and electrical engineer. A sound structural shell and a carefully-designed floor plan are absolutely essential to low initial costs, long life and low operating costs for the mechanical equipment.

2. The present heating equipment is capable of producing comfortable temperature conditions in any houses which are properly built.

3. Builders of low-cost housing should refrain from installing a lot of unnecessary gadgets which are put in at the expense of the structure.

APPENDIX I—HEATING IN CHATHAM VILLAGE

The houses in Chatham Village are heated with one-pipe steam systems supplied by individual gas-fired boilers. The reasons advanced for using gas were: (1) elimination of smoke nuisance, (2) elimination of coal deliveries, (3) elimination of ash disposal. The deciding factor in favor of the one-pipe system was very likely the lower first cost. To me the reasoning in this case does not appear to be consistent.

A short time ago, figures were released showing that the average cost of heating 125 houses by gas during the first heating season was \$54. (Coal in Pittsburgh would not have been over \$25. This is quite serious, since the object of the project was to provide better shelter at lower cost for the low-income groups.)

Because of a new rate structure recently announced by the local gas companies, the fuel cost would probably favor gas rather than oil in a group heating plan. This new rate only affects consumers who use gas in excess of 15,000 cu. ft. per month, which means very little to the occupant of a small gas-heated home, as his monthly consumption will seldom be this high. A group of houses heated by a single unit would benefit by the lower rates nearly every month of the heating season.

APPENDIX II—COMMENT ON ACTIVITIES OF MANUFACTURERS

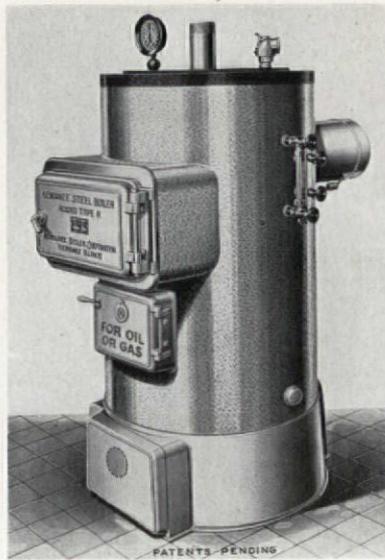
During the past few years much thought has been devoted to the development of heating and ventilating equipment, and many new or redesigned products have appeared on the market. This same period has also witnessed the entry of manufacturers of other lines into the field of heating, ventilating and air conditioning.

Only a small part of this recent development work has been carried out with the intention of improving the conditions in the lower-priced homes (\$4,000 or less).

The Owens-Illinois Glass Co. has developed a glass-wool filter for gravity warm-air furnaces. A



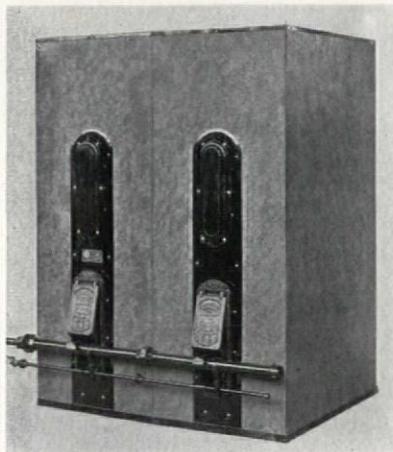
General Electric oil furnace.



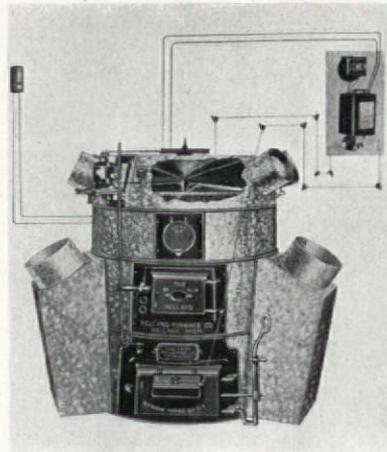
Kewanee boiler for oil or gas.



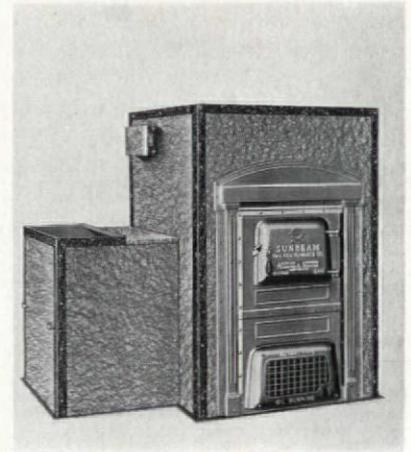
American Radiator "Arcola."



Mueller gas-fired furnace.



Holland "Vaporaire," electric control.



Fox oil-burning furnace.

filter holder can be installed in the return duct for about \$20 to \$25. The cost of these filters is so low that they can be thrown away and replaced with new ones each heating season.

Although the warm-air furnace provides the lowest first cost of any central heating system, it is seriously handicapped by the lack of intelligent merchandising principles. Most of the furnaces are made by small foundries scattered over the country, whose market is generally restricted to within a radius of a few hundred miles of their plant.*

Individually these companies could not have afforded to do any extensive research work, but for the past fifteen years they have collectively, through the National Warm Air Heating Association, carried on a thorough program at the University of Illinois. The results of this work have been published, and most of the companies have redesigned their furnaces to take advantage of findings of the test work.

Their recent work, however, has been devoted largely to mechanical circulation and air conditioning. This, of course, will increase the initial cost instead of decreasing it. Some of these concerns have attempted to build these units for addition to existing furnaces at extremely low prices, but most of these devices are of questionable value. I believe it is also questionable to install any mechanical device in a home where one cannot expect intelligent handling, unless such device is a necessity.

For radiator heating systems the American Radiator Co. has announced an improved design for its Arcola systems. As one of the companies sponsoring General Houses, Inc., the American Radiator-Standard Sanitary Corp. has devoted some thought to low-cost housing. To date, most of the emphasis has been placed on better plumbing installations with little being said about heating.

*Some of the warm-air furnaces which are nationally advertised are manufactured by: Holland Furnace Co.; Fox Furnace Co. Div. of American Radiator Standard Sanitary Corp.; L. J. Mueller Furnace Co.; Meyer Furnace Co.

Apparently, believing that the low-priced builder can best be helped by a change in merchandising and financing methods, the Sears-Roebuck Co. have intensified their sales efforts for all building materials including heating and plumbing equipment. The Sears-Roebuck Co. are not manufacturers but are merchandisers of goods made to their own specifications.

In the heating field they are offering both furnace and boiler-radiator systems. The equipment appears to be substantially made and, with reasonable care, should last as long as other competitive products. The company has adopted the policy of selling the complete system in place. The salesman sends in the measurements of the house with notes on the type of construction to a centrally located engineering office. Here the installation is carefully designed and the cost estimated. If the proposal is accepted, the plans and necessary material are sent to the job, where the equipment is installed by local furnace men or pipefitters with whom Sears-Roebuck have working agreements.

The head of the Pittsburgh district, which is said to have the most profitable sales, prefers to limit his installations to houses and small stores leaving the larger jobs to established contractors. He also prefers to sell either a warm-air or hot-water system because of their simplicity of operation and low maintenance charges.

This plan of merchandising is intended to help the individual builder. Unlike a large group-housing project, the independent owner will not have benefit of unbiased planning service or competent inspection during erection. Because of the very low price*, the material is installed on what amounts to a piecework basis with low rates.

One other device intended for the low-cost field is the Jeddo-Highland Heaterange, which has been previously mentioned.

To my knowledge, these are the most important developments which have been announced in the field of low-cost heating. Many other products have been introduced, but they will have their prin-

cipal application in industrial and commercial buildings. It would extend this paper somewhat indefinitely to discuss in a fair manner all the companies that manufacture heating equipment. For example, there are about 400 different makes of oil burners offered for sale in the United States. The catalogue section of the A.S.H.V.E. Guide provides a quick reference list for the more prominent manufacturers.

APPENDIX III—MINIMUM REQUIREMENTS FOR CONSTRUCTION

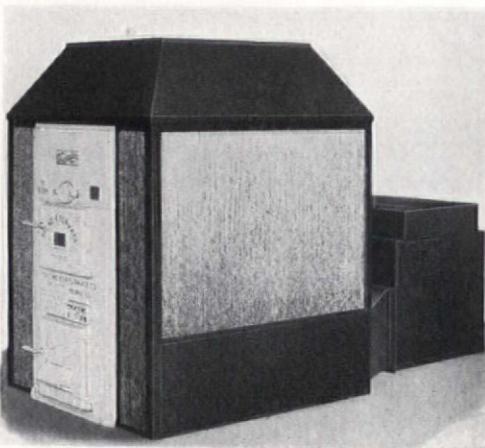
In order that the heating plants in residences will produce satisfactory comfort conditions, all house construction should meet the following minimum requirements:

1. An effective wind stop shall be placed in the outer surface in wall and roof construction.
2. In all walls of air space construction, stops or headers shall be placed at least at each floor level in order to reduce the free circulation of air between the wall surfaces.
3. Sheathing, where used, shall be placed with tight joints.
4. Window and door frames shall be effectively caulked to reduce air leakage.
5. Sash shall be carefully fitted to reduce air leakage. In severe climates, the windows shall be weatherstripped.
6. The heat resistance of the walls and ceilings shall be high enough to prevent the inside surface temperature from falling below 62° F during the coldest weather when the breathing line air temperature is held at 70° F. (4)

*A two-pipe hot-water system for a 5-room bungalow is sold for \$300 to \$350.

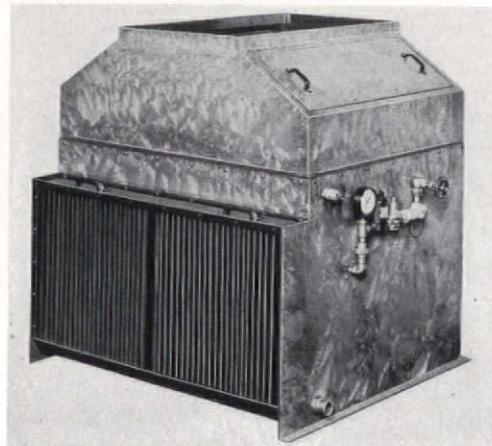
Judging from preliminary announcements, the new Arcola system of American Radiator Co. will be priced to compete with Sears-Roebuck installations.

(4) The selection of Building Insulation; T. F. Rockwell, *Architectural Record*, August, 1933.



(Left) Weir steel furnace with fan-filter unit attached for cleaning the air and forcing circulation. Meyer Furnace Co.

(Right) "Climator III" Air Conditioning Unit—a combination of fan, filter and washer in one casing. L. J. Mueller Furnace Co.



CORRESPONDENCE: ALUMINUM FOIL INSULATION

To the Editor:

Messrs. J. Bryte Barnitt and E. B. Svenson of our Development Engineering Division have called my attention to a number of inaccurate statements in the article, "Insulating Properties of Aluminum Foil," which appears on page 237 of the September issue of *THE ARCHITECTURAL RECORD*. I give you below their comments.

DOUGLAS B. HOBBS,
Aluminum Company of America.

"We have read with interest the article in *THE ARCHITECTURAL RECORD*, 'Insulation Properties of Aluminum Foil,' by Prof. Theo. F. Rockwell, Instructor in Heating and Ventilating, Carnegie Institute of Technology, and thoroughly appreciate any article which appears on this new and interesting type of insulating material. It is our opinion, however, that Prof. Rockwell's article leaves the impression that aluminum foil is a very expensive material to use in the insulation of houses and that it has a somewhat doubtful insulating value and questionable longevity.

"During the past three years, we have been in close touch with all of the commercial applications in the United States for aluminum foil insulation and our impressions, as well as those of the users, are decidedly contrary to those created by Prof. Rockwell.

"We heartily agree with the statement that aluminum foil insulation is most effective when both surfaces are exposed to the air; but we cannot subscribe to the inference that when aluminum foil is used according to methods 2 and 3 it is an expensive insulation. As a matter of fact, aluminum foil is much less expensive where only one side is exposed than other insulating materials employed in the same manner. A common method of utilizing fibrous insulating boards is in a single layer on studs either in conjunction with or as sheathing or as a plaster base. Aluminum foil for this purpose costs approximately six-tenths of a cent per square foot and there are no royalties involved. When aluminum foil is used in this manner, it has an insulating value better than one-half inch of insulating board which, to our knowledge, has never been sold for as low as six-tenths of a cent per square foot. The cost of application of either material is approximately one-half cent per square foot, based on carpenter labor at \$1.125 per hour. Since the aluminum foil is less expensive for the same service, the statement, 'A comparison of these results with Tables III and IV in "The Selection of Building Insulation" does not indicate that aluminum foil installed in this manner is the cheapest way to insulate a house,' is decidedly misleading.

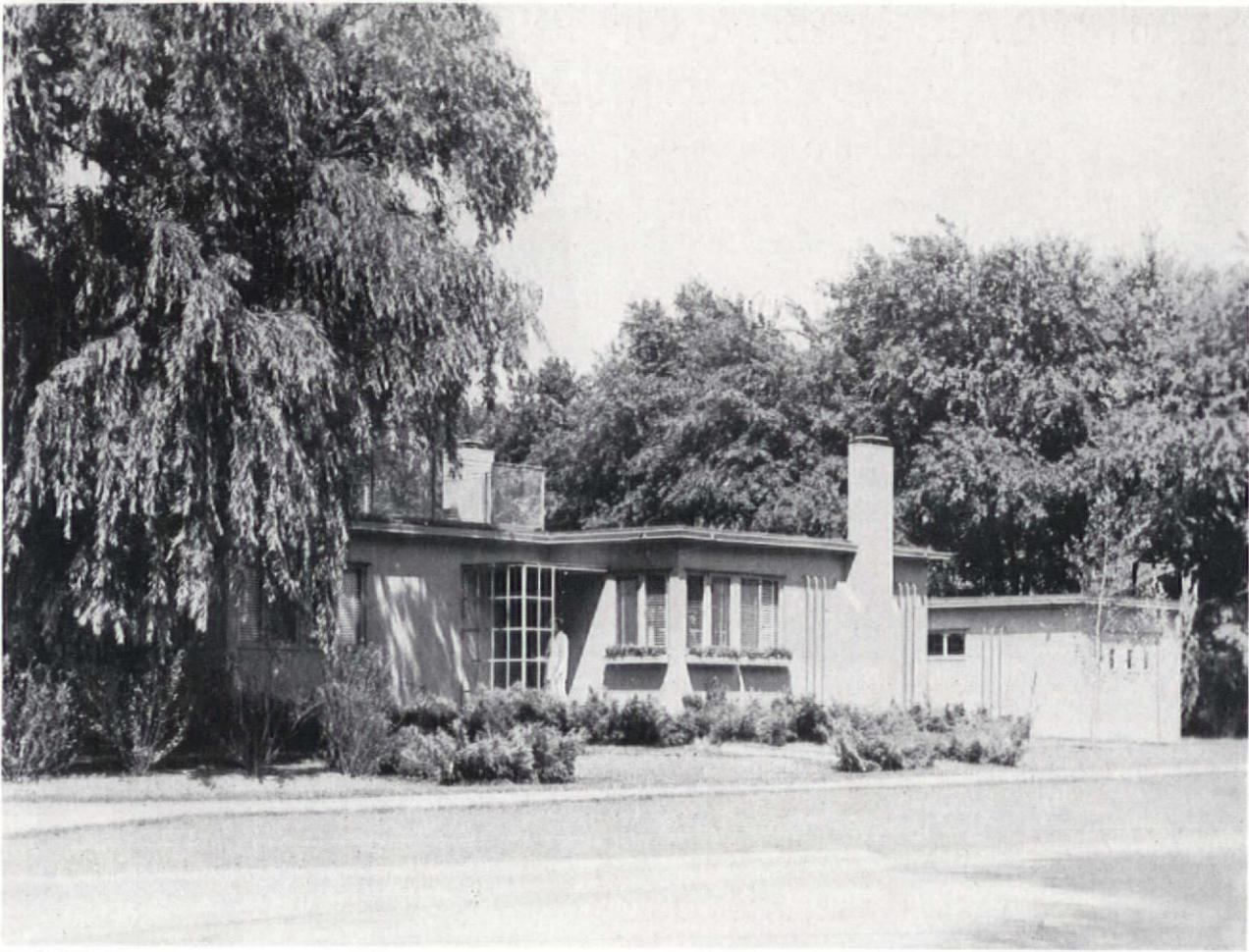
"We also agree that the most favorable use of

either the one-half inch insulating board or the aluminum foil, as far as insulation is concerned, is its placement in the middle of the air space and that application on the side gives less insulation for the expenditure than application in the middle.

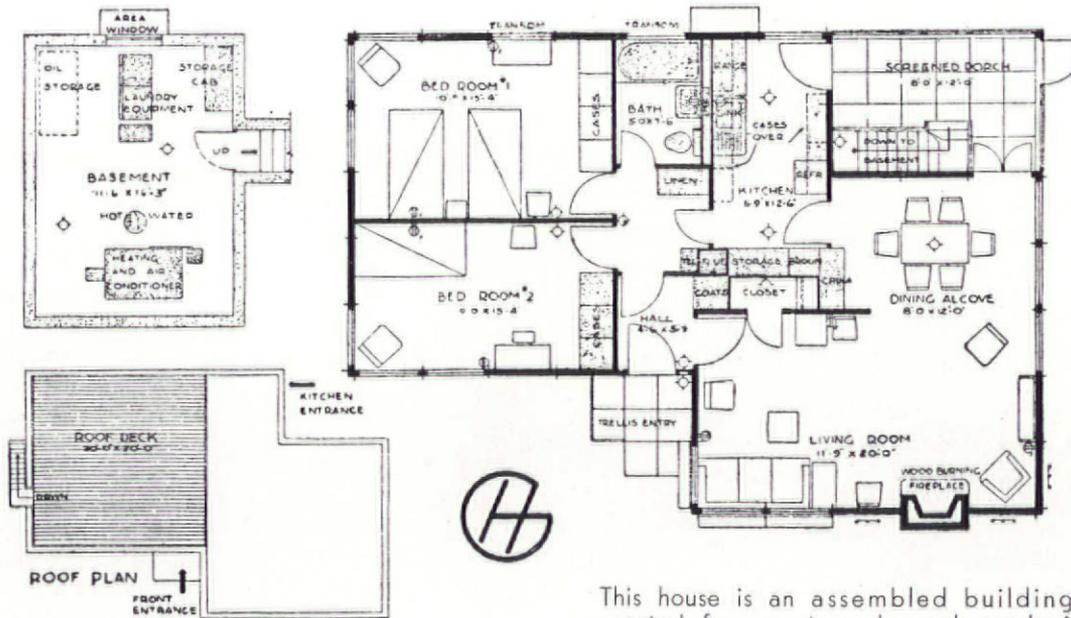
"Under Method 4, we question the cost of 4.5 cents per square foot to install aluminum foil. This method is covered by U. S. patent No. 1890418 to Schmidt. Foil installed in this manner has never sold for more than two cents per square foot including royalty. Accurate cost figures on this type of application have never been over one-half cent per square foot when using labor at \$1 to \$1.25 per hour. From data we have gathered from practical builders who have used both aluminum foil and other types of insulation, the cost is decidedly in favor of aluminum foil.

"The statement at the top of the second column concerning the optimum spacing is correct but does not apply to house insulation, since three or four layers of foil evenly distributed in the air space will provide adequate insulation in a building wall. Applying four layers at three-tenths inch intervals, with a larger air space on one side, is decidedly less effective than four layers evenly spaced within the inclosure.

"With reference to the statement regarding the permanence of a bright surface on aluminum foil, there are, today, many applications both in Europe and the United States which are at least five years old. We cannot point to older applications because the use of foil for insulation purposes does not date back any farther. The earlier applications are, however, in perfect condition and some of these have been subjected to much more severe service than would ever be encountered in home insulation. The top surface of the top layer of foil installed in a horizontal position will be partially obscured by dust over a period of years; but since it is only one out of six or eight surfaces, only a small proportion of the insulating value is lost. The foil sheets in a vertical position will not accumulate dust. Furthermore, aluminum is not subject to corrosion by normal atmospheric conditions, nor is it affected by the sulphur-laden gases of many industrial communities."



R. C. Weinberg



This house is an assembled building, erected from parts and panels made in the factory and then shipped to the site.

**A FABRICATED HOUSE AT ELMHURST, ILLINOIS
GENERAL HOUSES, INC.**

STATISTICAL REVIEW OF PROGRESS IN PUBLIC WORKS PROGRAM

By L. SETH SCHNITMAN, Chief Statistician, F. W. Dodge Corporation

THE Federal public works program has been speeded up in recent weeks. Allotments by the PWA have been increased materially, but more important even than this development is the fact that actual contracts under these allotments have begun to show sizable expansion. During the period from July 1 through October 31, i. e., since the Public Works Administration started to function, a contract total of \$240,330,100 was reported in the 37 eastern states for all types of publicly financed construction, Federal, state and local. During the corresponding four-month period of 1932 publicly financed construction awards in the same territory aggregated \$278,686,500.

Although this comparison indicates a decline of 14 per cent, it is significant to note that for each of the four months of 1933 under examination publicly financed contracts were larger than in the month next preceding.

Here it is well to direct attention to the accompanying table giving a distribution of PWA allotments to October 21, 1933, aggregating \$2,047,571,988 out of an authorized total of \$3,300,000,000. It should be noted that as of the above date about \$1,250,000,000 of the fund still remained to be allotted. While it is difficult to determine accurately what percentage of the allotments to date is for building as distinguished from engineering it is doubtless correct to indicate that thus far upwards of 10 per cent of the total fell in the former category if due weight be given to the building which will likely be authorized under the blanket appropriations to Federal Departments, to the Tennessee Valley Authority and the like. Many more building projects may be expected in future allotments which will be made chiefly to states, municipalities, limited-dividend housing corporations and the like. It will be seen from the table that every major classification of construction, with three exceptions (commercial, factories, religious and memorial), is represented in allotments to date.

It appears of interest to indicate, merely as a sample of the operations of the PWA since its inception, that in the New England territory a total of \$130,340,600 in projects seeking PWA funds was reported to October 21, 1933, by F. W. Dodge Corporation as being in the contemplated stages. During the same period the PWA authorized allotments in New England of \$9,994,423 plus the New England quota of the more than 400 millions available for the nation for highways as shown in the accompanying table. Publicly financed contracts awarded in New England in which PWA funds figured during the same period totaled only \$6,008,700. A similar comparison for the Middle Atlantic states indicates the following: contem-

plated construction to October 21, 1933, involving applications for PWA funds, \$213,001,200; PWA allotments of only \$10,663,200; and contracts of only \$5,227,700.

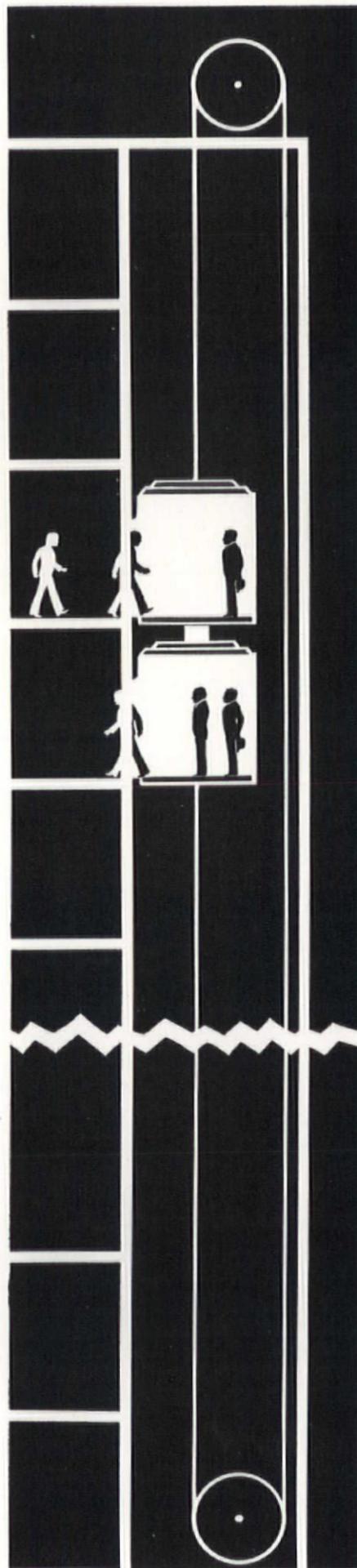
From these samples taken at random it is apparent that applications and proposed applications for Federal construction loans were materially larger than allotments and that as yet contracts let under allotments are comparatively small. Considerable speeding up in contract letting has taken place in recent weeks but even further acceleration is necessary in order that the NRA program be primed effectively by necessary capital expenditures.

PWA ALLOTMENTS TO OCTOBER 21, 1933

Farm Credit Bureau (statutory)	\$100,000,000
Federal Depts. (physical improvements not specified)	25,910,000
Administrative expenses (PWA; NRA; etc.)	5,405,000
Naval Construction	238,000,000
Construction in Alaska and Insular Possessions	4,599,920
Highways, secondary highways, forest roads and trails, street improvements	470,506,195
Tennessee Valley Authority	50,000,000
Irrigation, reclamation, forest service, conservation, parks	505,086,815
Rivers and harbors, flood control, dams, etc.	217,377,808
Bridges	51,339,687
Tunnels (1 project)	37,500,000
Sewers—storm and sanitary (79 projects)	39,979,345
Dock and Sewer (1 project)	21,000
Sewer and Water Supply (3 projects)	240,000
Incinerators (2 projects)	229,000
Water Supply Systems (80 projects)	23,252,833
Water and Natural Gas (1 project)	290,256
Natural gas plant (1 project)	72,000
Electric Power Plants (7 projects)	8,272,000
Street Lighting (1 project)	60,000
Lighthouses	5,378,734
Coast defense and coast guard improvements	31,530,035
Navy yards and docks	25,269,637
Residential buildings—Army housing	57,797,776
Low-cost housing (16 projects)	44,239,958
Hospital dormitories (3 projects)	2,471,500
Subsistence homesteads (statutory)	25,000,000
Schools, colleges and libraries (43 projects)	9,675,732
Hospitals and institutions (29 projects)	10,410,651
Border and quarantine stations (15 projects)	1,005,171
Post offices (44 projects)	15,955,158
Miscellaneous public buildings (35 projects)	8,814,480
Federal depts. for specified physical improvements	31,617,791
Terminal market and docks (1 project)	250,000
Stock farms (2 projects)	13,500
Total to 10-21-33	\$2,047,571,988

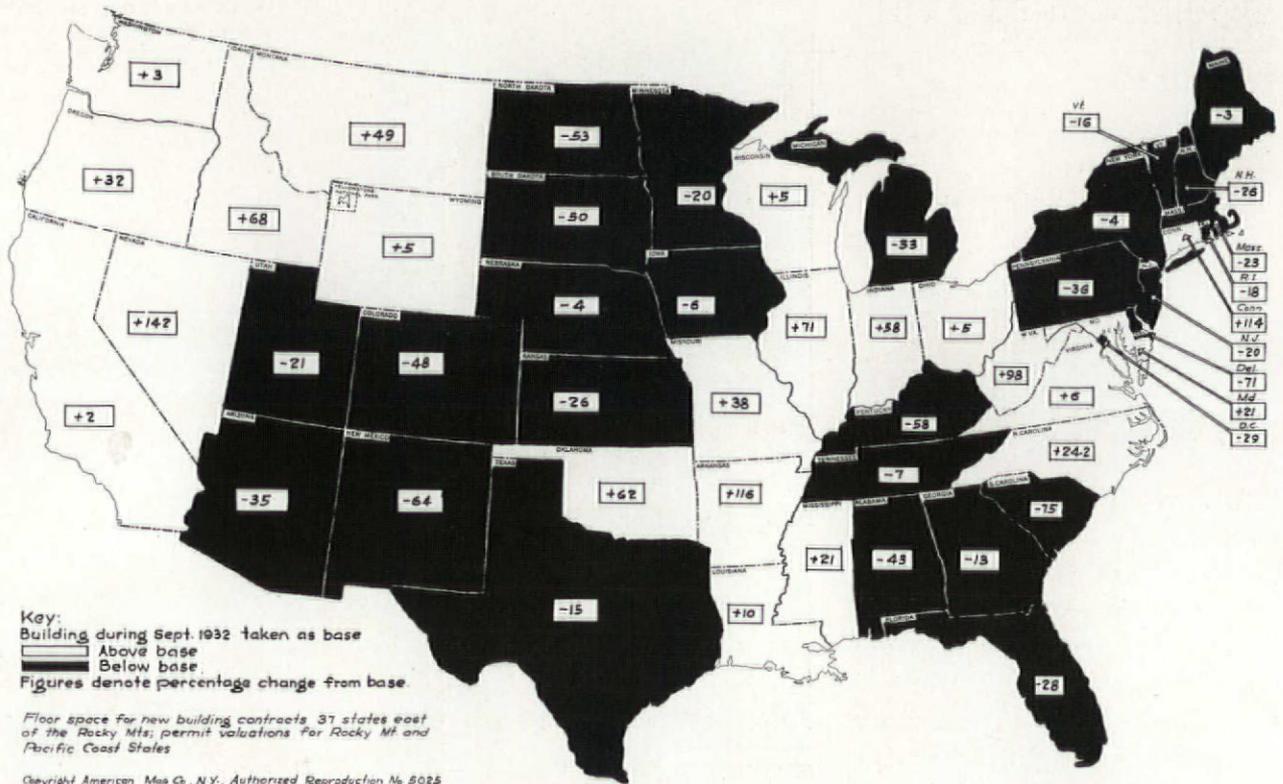
PROBLEM:

WHEN plans were under consideration for a new building for the Cities Service Company, New York City, known as Sixty Wall Tower, there was one very obvious drawback. The plot of ground was small. The zoning law limited the height of the main part of the building to thirty stories. A monumental tower was desirable. If this tower was built higher than forty-eight stories, the number of elevators required for efficient service would occupy an uneconomic proportion of floor space.



SOLUTION:

HERE was an ideal opportunity for the first practical application of a new step in elevator practice which Otis engineers had been developing through years of research—the double-deck elevator. With the installation of double-deck elevators, it was possible to make the tower sixty stories high. Eight of these elevators now serve this building, which reaches above all others in lower Manhattan and is the third tallest building in the world. These eight tower elevators provide transportation facilities equivalent to fourteen ordinary elevators. They conserve space, cut operating costs, and, together with eighteen single-deck elevators and ten escalators, provide this building with adequate and convenient vertical transportation facilities. . . . Otis Elevator Company, offices in the principal cities of the world.



BUILDING TRENDS AND OUTLOOK

By L. SETH SCHNITMAN, Chief Statistician, F. W. Dodge Corporation

The significant development in the September record of construction contracts awarded was the large gain in publicly-financed projects. It will be recalled that the first evidences of improvement at the beginning of the second quarter of this year occurred in the privately-financed projects. This gain which was fairly consistent and general both in residential and non-residential building was followed by a marked increase last month in publicly financed construction. Most of the gains during September occurred in this type of construction while privately financed construction continued to hold the levels previously attained.

Of further significance was the total of new construction projects contemplated. Since last March there has been a continued and rapid increase in new work planned. The September total amounting to \$846,726,700 represented the largest monthly total since April, 1930. This is a most favorable augury pointing toward continued construction improvement. The territories in which the largest gains occurred included the Southeastern States, Chicago Territory, Southern Michigan, St. Louis Territory, Kansas City Territory, New Orleans Territory and Texas.

September construction contracts amounted to \$122,615,700, a gain of almost 16 per cent over the August, 1933, total of \$106,131,100 and but slightly below the September, 1932, total of \$127,526,700. This is the first month in which the 1933 total practically equalled the corresponding month of 1932. The cumulative total for the first nine

months of 1933 amounted to \$743,553,300 as compared with \$1,057,363,200 for the corresponding period of 1932.

The largest gain in the September contract record over August occurred in public works with a month's total of \$57,323,800 as compared with \$32,002,500 for August. This increase was due largely to additional contracts for highway construction and levee work in the Mississippi valley. These gains occurred chiefly in the Pittsburg, Southeast, Central Northwest, Southern Michigan, St. Louis, Kansas City and New Orleans Territories.

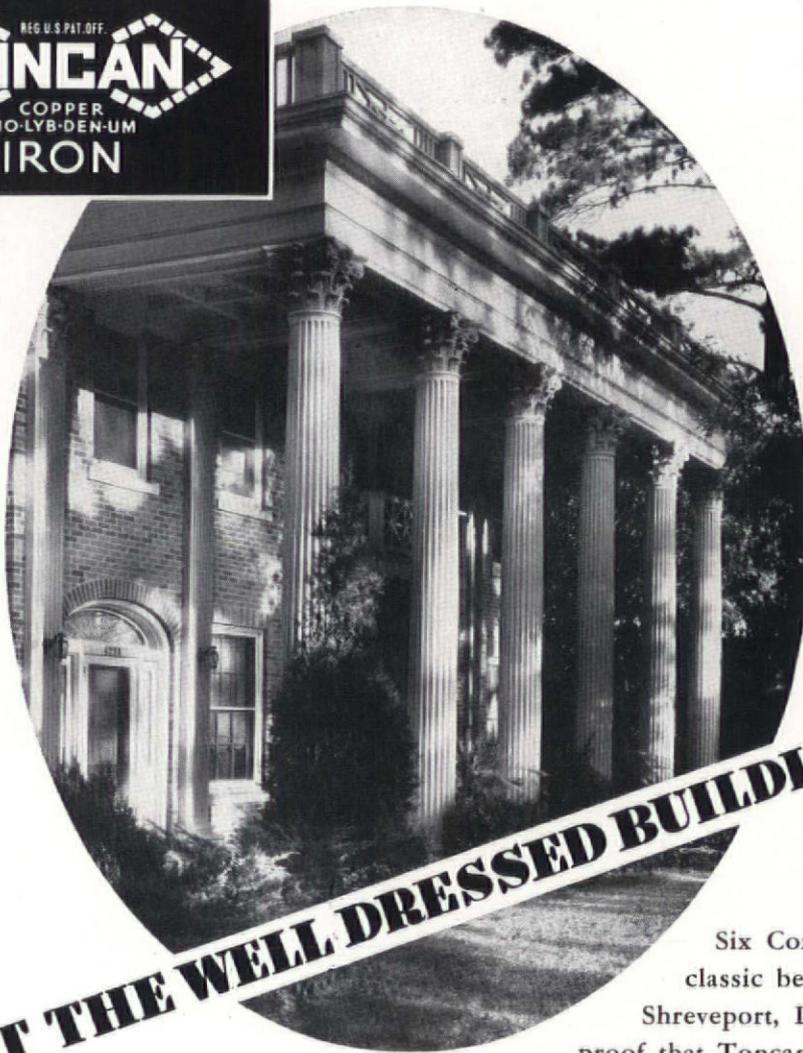
Non-residential building for the month amounted to \$37,977,300 as compared with \$32,796,600 for August and \$35,997,400 for September of last year. New hospitals, distillery projects; chemical plants and some new public buildings contributed largely to this increase which occurred in the following territories: Metropolitan New York, Southeast, Chicago, New Orleans and Texas.

Residential building started during September amounted to \$23,889,300 as compared with \$21,937,000 for August and \$22,803,900 for September, 1932. Two large dormitory units in the New England and Chicago Territories contributed to this increase.

Public utilities for the month totaled \$3,425,300 as compared with \$19,395,000 for August and \$4,522,700 for September, 1932. The unusually high total for August was due to several individually large contracts for water supply systems.



H. H. BAIN RESIDENCE, SHREVEPORT, LA.
*Architects: Jones, Roessle, Olschner & Weiner
Shreveport*
Fabricator: H. H. Bain Sheet Metal Co., Shreveport



WHAT THE WELL DRESSED BUILDING WILL WEAR

Six Corinthian columns lend an air of classic beauty to the home of H. H. Bain, Shreveport, La. They are illustrated here as proof that Toncan Iron, of which they are made, holds architectural possibilities for every type of building. The columns are twenty feet high, packed solidly with sand. For six years they have weathered the elements and are today in the same condition as when installed.

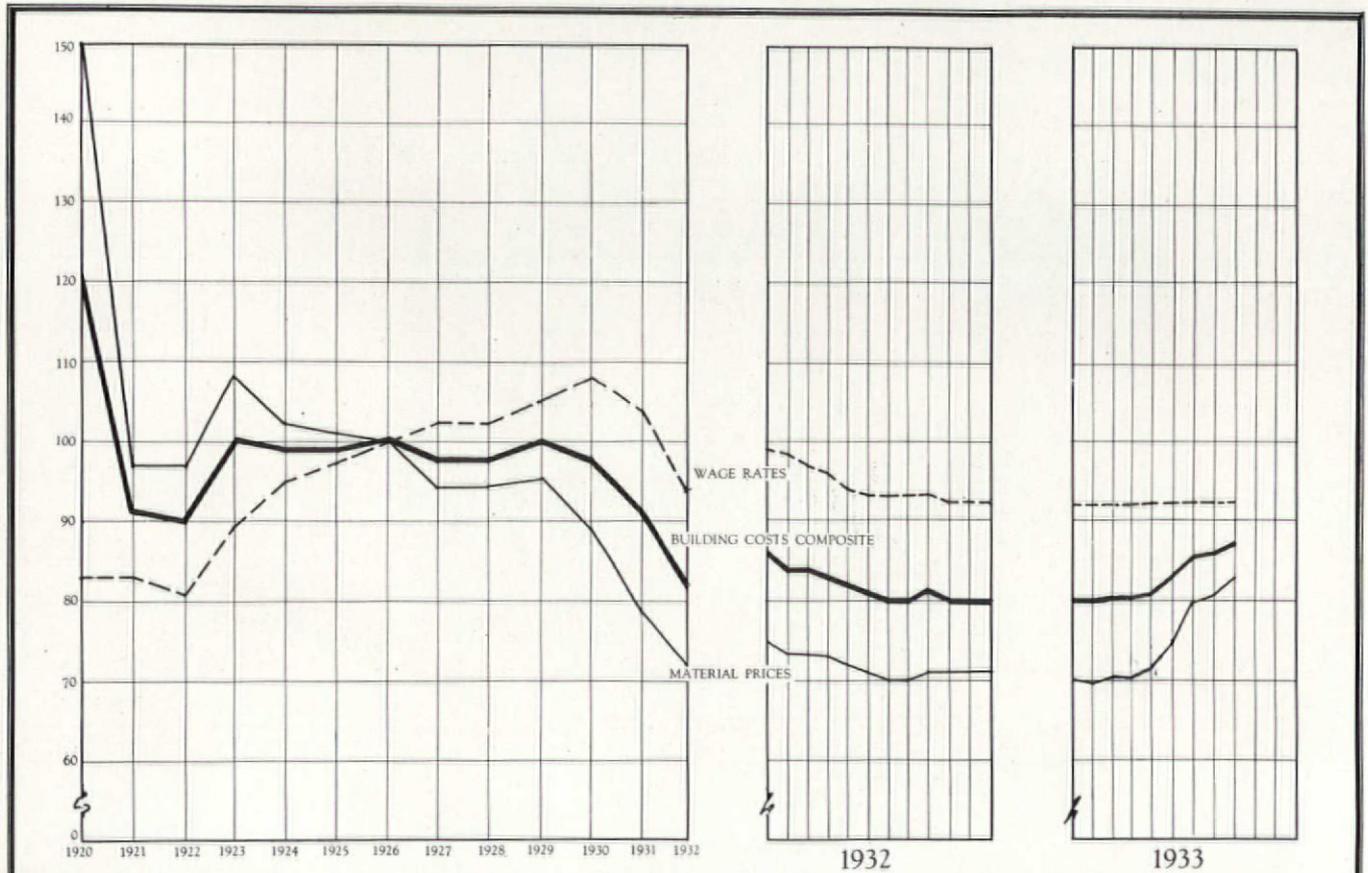
Architects who know Toncan Iron know that it is equally well suited to both exterior and interior service. They know that it is no ordinary ferrous metal—that it is an alloy of refined iron, copper and molybdenum carefully developed in the open hearth to give it a resistance to rust that is surpassed among the ferrous materials only by the more expensive stainless irons and steels. They know, too, that fabricators find it easy to work—easy to make into intricate designs, because it bends, draws, solders and welds with the utmost freedom.

Hundreds of architectural uses for Toncan Iron are illustrated and described in "The Path to Permanence." Read the complete story of this modern, long-lasting alloy. Send for a copy today.

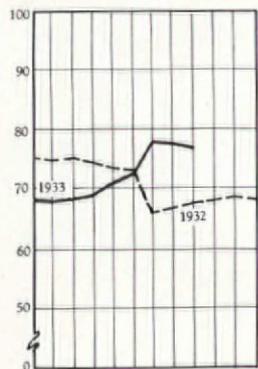
REPUBLIC STEEL CORPORATION
GENERAL OFFICES  YOUNGSTOWN, OHIO

MATERIAL PRICES, BUILDING WAGE RATES AND BUILDING COSTS COMPARED

1926 Monthly Average = 100



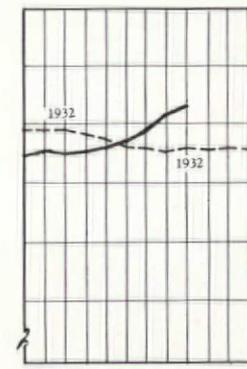
WHOLESALE PRICE INDEXES



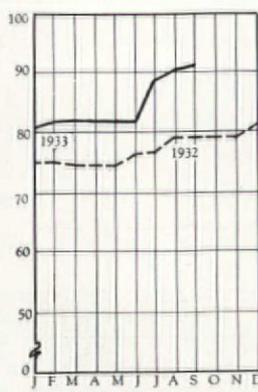
PAINT MATERIALS



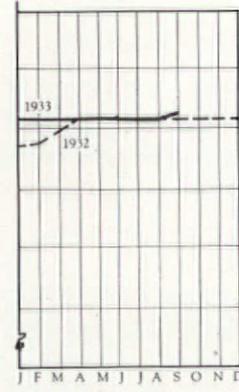
LUMBER



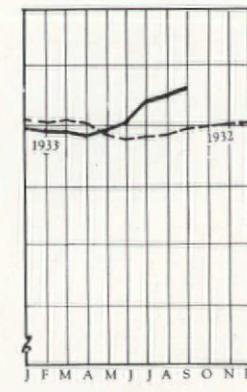
BRICK AND TILE



CEMENT

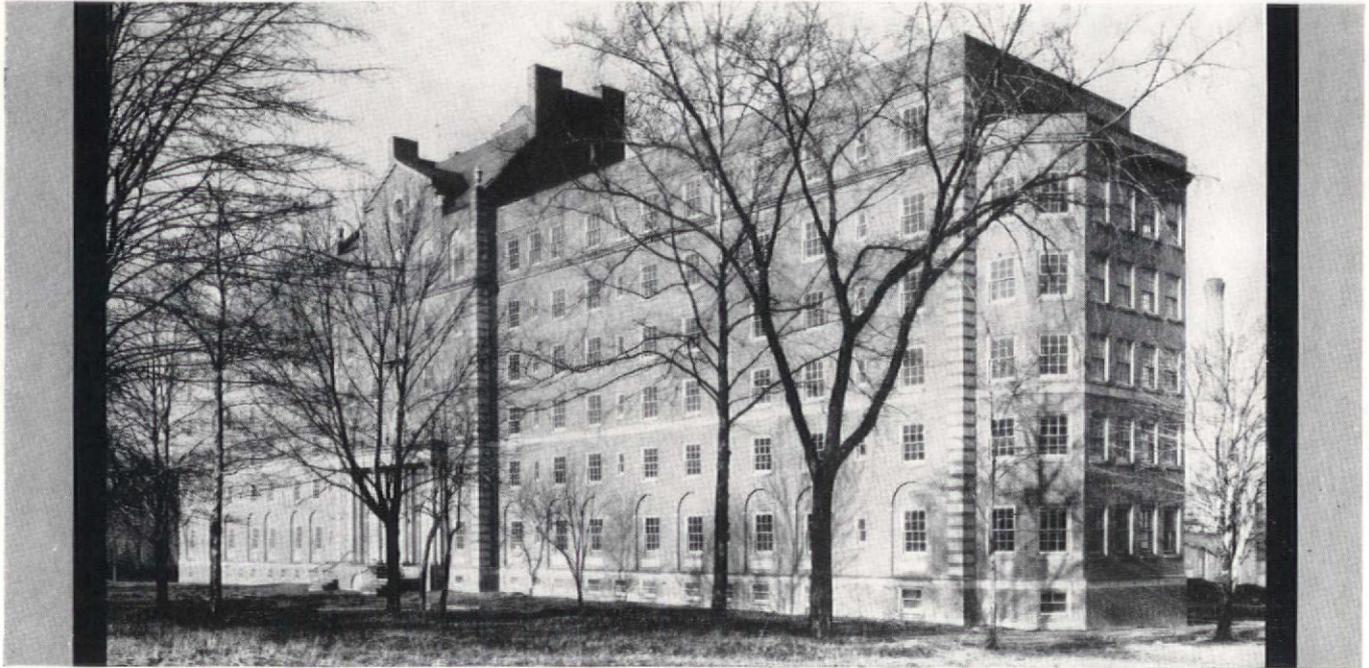


STEEL



OTHER MATERIALS

RU-BER-OID Built-Up Roof Selected for Another Hospital Job



Huron Road Hospital, Belmore and Terrace Roads, E. Cleveland, Ohio. Architect: George S. Rider Co. General Contractor: John Gill & Sons Co. Roofing Contractor: The John Weenink Sons Co. 19000 square feet RU-BER-OID Asphalt Built-Up Roofing Gravel Top.

Cleveland Architect Makes Choice Because of RU-BER-OID's Known Dependability

THE HIGH REGARD which architects and engineers hold for RU-BER-OID Built-up Roofs is best indicated by the many well-known buildings the world over that are RU-BER-OID Roofed.

RU-BER-OID Built-up Roofs are made in three popular types, Asbestos, Coal Tar Pitch and Felt, or Asphalt. Each specification has been drawn to meet the varying conditions of climate, unusual wear, roof design, proximity to fire hazards, life of building, etc., and in a price range to fit every job.

These roofs, when applied by approved contractors, may be bonded, offering the owner a guarantee as to workmanship and materials for 10, or 20 years, according to the specification used. The guarantee is backed by a National Surety Bond.

For detailed specifications of RU-BER-OID Built-up Roofs see Sweets, or if you have an unusual roofing problem, write or phone the Engineering Department of any Ruberoid Office. Ruberoid Co. engineers are always ready to give you the benefit of their experience in meeting special conditions.



The RUBEROID Co.

Sales Divisions: RUBEROID MILLS
CONTINENTAL ROOFING MILLS - SAFEPACK MILLS - H. F. WATSON MILLS - ETERNIT MILLS
Offices and Factories: NEW YORK, N. Y.
CHICAGO, ILL. - MILLIS, MASS. - ERIE, PA.
BALTIMORE, MD. - MOBILE, ALA.



WAGE SCALES IN THE BUILDING TRADES

Information Furnished by National Association of Builders Exchanges and Compiled by Division of Statistics and Research,
F. W. Dodge Corporation, as of October 15, 1933

	Asbestos Workers	Bricklayers	Bricklayers Tenders	Carpenters	Cement Finishers	Electricians	Hoisting Engineers	Iron Workers —Ornamental	Iron Workers —Structural	Laborers	Lathers	Painters	Plasterers	Plasterers Tenders	Plumbers	Roofers— Composition	Roofers— Slate & Tile	Sheet Metal Workers	Steamfitters	Stone Masons	Tile Setters	Tile Setters Helpers	
Akron.....	\$1.00	\$1.25	\$0.45	\$0.70	\$0.70	\$0.75	\$0.70	\$0.60	\$0.60	\$0.40	*\$0.87½	\$0.65	*\$1.00	\$0.62½	\$0.85	\$0.80	\$0.80	\$0.80	\$0.85	*\$1.25	*\$1.25	*\$0.50	
Atlanta.....	1.00	1.25 1.40	1.30 .45	.70	1.25	.90	.60	.35	1.85	1.25	.25	1.00	.30	1.25	.80	.80	1.00	1.25	1.00	1.25	1.25	.40	
Baltimore.....	1.00	*1.00	1.00	.65	*1.00	*1.00	*1.25	*1.37½	*1.37½	.20	*1.25	*.90	*1.25	1.00	*1.00	.75	.75	*1.12½	*1.00	1.00	1.25	.72	
Boston.....	1.25	*1.30	.70	*1.17½	1.17½	*1.25	1.17½	*1.20	*1.20	.70	*1.25	*1.12½	*1.37½	*.95	*1.25	*1.17½	*1.05	1.17½	*1.25	*1.30	*1.30	*.95	
Buffalo.....	1.00	*1.12½		*1.00	1.00	*1.00	1.00	1.12½	1.12½	.40	1.00	*1.00	1.00		1.00	.60	1.00	1.00	*1.00	*1.12½	*1.18½		
Chicago.....	1.37½	*1.37½		*1.31¼	1.31¼		1.31¼			.80	82½	*1.37½	*1.37½		1.37½	1.37½	1.40	1.37½	1.37½	1.37½	1.37½	1.00	
Cincinnati*.....	1.15	1.25	.70	1.20	1.02½	1.25	1.25	1.25	1.25	.45	1.31¼	1.15	1.37½	.70	1.25	.92½	1.07½	1.07½	1.12½	1.00	1.00		
Cleveland*.....	.80	1.17½	1.25	.90	.90	1.00	1.12½	1.25	1.25	57½	72	1.25	1.00	1.25	1.25	1.15	1.37½	1.12½	1.25		1.25	81¼	
Columbus.....	1.00	1.30	.62½	.80	.80	1.00	1.15	1.25	1.25	.40	1.00	.80	1.00	.62½	1.00	.80	1.00	.80	1.00	.75	1.25	.50	
Dallas†.....	10.50	10.00	.50	8.00	10.00	*11.00	10.00	10.00	10.00	.35	10.00	*9.00	*10.00	*.50	12.00	8.00	9.00	*10.00	12.00	10.00	*12.00	†.75	
Dayton*.....	1.25	1.30	.80	1.00	1.15	1.55	1.25	1.35	1.35	.35	1.10	1.00	1.25	.80	1.15½	.85	1.00	1.00	1.15½	1.30	1.50	.60	
Denver†.....	9.00	*13.00	7.00	10.00	11.00	11.00	10.00	10.00	10.00	4.00	11.00	*10.00	12.00	7.00	11.00	8.00	8.00	9.00	9.50	13.00	10.50	†.62½	
Des Moines.....	1.00	1.25	.65	1.00	1.00	1.00	1.00	1.00	1.00	.55	1.00	1.00	1.25	.75	1.25	1.12½	1.12½	1.12½	1.25	1.50	1.25	.80	
Detroit.....	1.37½	1.25 max.	.60	1.00	.90	1.40	1.00	1.20	1.25	.55	1.37½	1.00	1.25	.80	1.50	.90	1.00	1.00	1.50	1.50	1.25	.80	
Duluth.....	1.00	1.00	.50	.80	.80	1.00	.80		1.00	.50	.80	.80	1.00	.70	1.00	.70	1.00	.85	1.00	1.00	1.00	1.00	
Erie.....		1.00	.45	.80	.80	*1.00	.90	.60	.80	.90	.35	.90	.60	.40	1.00	.50	.80	.80	.90	*1.00	1.00	.80	.50
Grand Rapids.....	.65	.80	.40	.60	.65	.90	.75	.80	1.00	.35	.80	.60	.80	.40	.90	.50	.70	.70	.90	1.25	1.25	.50	
Houston.....		1.00	.35	.75	.75	1.00	.75	1.00	1.00	.35		.62½	1.00	.35	1.00	.75	1.00	1.00	1.00	1.00	1.00		
Indianapolis.....	1.32½	1.62½	.90	1.22½	1.17½	1.50	1.37½	1.45	1.45	.40	1.37½	1.25	1.57½	1.00	1.00	.90	1.27½	1.22½	1.50	1.62½	1.50	.60	
Kansas City.....	.90	1.32½	.80	1.00	1.00	1.00	1.00	1.00	1.00	.60	1.00	1.00	1.06¼	.80	1.00	.92½	.92½	1.00	1.00	1.12½	1.25	.62½	
Los Angeles†.....	10.00	8.00	6.00	7.00	8.00	7.00	8.00	9.00	10.00	4.00	10.00	7.00	9.00	6.00	9.00	7.00	7.00	8.00	10.00	8.00	6.00	†7.5	
Louisville.....	1.12½	1.00	.50	.80	1.00	1.00	1.00	1.00	1.00	.25	1.12½	.90	1.00	.50	1.12½	.30	.85	.85	1.12½	1.25	1.00	.50	
Memphis.....	1.00	1.37½	.50	.50	.50	1.00	.75	.75	.75	.20	1.00	.75	1.25	.50	1.25	.40	1.12½	1.12½	*1.25	1.37½	1.25	.50	
Milwaukee.....	1.00	1.00	.75	.92½	1.00	1.25	1.00	1.05	1.05	.60	1.00	1.00	1.00	.75	1.00	1.00	1.00	.92½	1.00	1.00	1.00	.75	
Minneapolis.....	1.00	1.00		.80	.80	1.00	.80	.90	1.00	.45	.85	.80	1.00	.70	1.00	.70	.70	.80	1.00	1.10	1.00	.65	
Nashville.....	1.00	1.00		.65		1.00				.30	1.00	.80	1.00	.30	1.00	.65	.65	.65	1.00	.90	1.25		
New Haven*.....		1.20	.50	1.06¼	1.20	1.00	1.27½	1.37½	1.37½	.45	1.27½	1.00	1.20	.60	1.06¼		1.50	1.06¼	1.06¼	1.20	1.20		
New Orleans.....	.65	.80	.55	.75	1.00	1.25	1.25	1.25	1.25	.35	.75	.90	1.25	.75	1.25	.40	1.15	.90	1.25	1.50	1.25	.35	
New York City†.....	11.20	13.20	8.00	11.20	11.20	13.20	13.20	11.20	13.20	6.60	11.20	11.20	12.00	8.50	12.00	10.28	12.62	11.20	11.20	13.20	11.50	8.50	
Oakland†.....	6.40	9.00	5.60	7.20	7.20	8.00	9.00	7.20	9.60	5.00	8.00	7.00	8.80	6.00	8.00	6.40	6.40	7.50	9.00	9.00	8.00	5.00	
Oklahoma City†.....	8.00	8.00	4.00	6.00	8.00	6.00	8.00	8.00	8.00	3.50	.80	7.00	8.00	.80	4.00	.80	6.00	6.00	8.00		11.00	†.62½	
Omaha.....	1.32	1.00	.45	.80	.90	1.00	1.00	.90	.90	.35	1.00	.80	1.00	.45	1.00	.72½	.87½	.87½	1.00	.90	1.00	.60	
Philadelphia.....	1.00	1.50		1.00	1.05	1.25	1.18½	1.37½	1.37½	.40	1.37½	.62½	*1.37½	.90	1.04	1.00	1.25	1.25	1.04	1.25	1.25		
Pittsburgh.....	*1.50	*1.50		*1.25		*1.56¼	1.37½	1.37½	1.37½	.70	*1.50	*1.18½	*1.50		1.50	*1.25	*1.50	*1.31¼	*1.50	*1.40	1.33¼	88.	
Portland, Ore.†.....	8.00	*9.60	7.20	7.20	*7.20	*8.00	9.60	8.80	8.80	7.20	*8.80	7.04	*9.60	*7.20	*8.80	7.20	7.20	*8.00	*8.80	*9.60	8.00	6.40	
Reading.....	.70	.80	.75	.75	.85	.75				.35	.75	.70	.85	.75	.90		.80	.80	.90	.75	.90	.50	
Richmond.....	.60	.65	.40	.35	.50	.80		.20	.70	.90	1.00	.60	.60	1.00	.60	.25	.60	1.00	.90	.75	1.25		
Rochester.....	.91	1.12½	.55	*.90	*1.12½	*1.15¼	.90	*1.00	.70-1.00	.55	.90	*.90	*1.12½	.55	*1.06¼	*.80	*.80	.90	*1.06¼	*1.12½	1.12½	.47½	
Salt Lake†.....		9.00	5.00	7.20	8.00	8.00	8.00	8.00	8.00	4.00	8.00	7.20	9.00	6.50	8.00	7.20	8.00	8.00	8.00	9.00	8.00	4.00	
San Antonio†.....	6.00	6.00	2.00	2.00	3.00	3.00	4.00	1.75	5.00	1.50	4.00	3.00	4.00	2.00	5.00	5.00	4.00	3.00	5.00	3.50	4.00	2.00	
San Francisco.....	10.00	10.00	3.00	7.00	8.00	7.00	8.00	4.50	10.00	2.50	7.00	7.00	8.00	3.00	8.00	6.00	6.00	6.00	7.00	8.00	10.00	8.00	
San Jose.....	6.40	9.00	7.00	7.20	7.20	9.00	9.00		9.60	5.00	8.00	7.00	8.80	7.50	8.00	8.00	8.00	7.20	8.00		8.00	5.00	
Seattle†.....	8.00	9.60	5.28	7.20	7.20	*8.80	8.00	8.00	8.80	4.75	*8.80	*4.50	*9.60	*6.40	*8.80	7.20	7.20	8.00	*8.80	9.60	8.00		
Sioux City.....	.90	1.00		.75	.75	1.00		1.00	1.00	.35	.90	.90	1.00	1.00	1.00	1.00	1.00	.90		1.25	1.00	.60	
St. Louis.....	1.25	1.25	1.00	1.25	1.31¼	1.50	1.47	1.47	1.47	.87½		1.25	1.50	1.06¼	1.43¼	1.17½	1.25	1.25	1.43¼	1.25	1.25	.76½	
St. Paul.....	1.18	1.00		.80	.80	1.00	.80	1.00	1.00	.50	.90	.80	1.00	.70	1.00	.70	.70	.85	1.00	1.00	1.00		
Washington, D.C.....	*1.50	1.75	.50	*1.37½	1.25	*1.65	*1.37½	*1.65	*1.65	.75	*1.62½	*1.37	*1.75	*.75	*1.50	*1.37½	*1.37½	*1.50	*1.50	*1.25	*1.50	.75	
Wichita.....	.60	1.25	.25	.40	.40	.50	.30	.40	.40	.20	.50	.50	.60	.25	1.00	.50	.50	.50	.75	.75	.50	.25	
Youngstown†.....	*1.37½	12.00	6.80	10.00	9.00	11.00	10.00	12.00	12.00		12.00	10.00	12.00	6.80	11.00	10.20	10.00			10.00		.70	

NOTE.—Where two figures are shown they are the minimum and maximum. All figures are for hour rates except as indicated. ††8-hour day. †Rate per hour. *On 5-day week basis. e Correction. Asterisk after city indicates all trades on five-day week basis.

ABOVE DATA ARE WAGE SCALES AND DO NOT NECESSARILY INDICATE ACTUAL WAGE RATES BEING PAID IN THE RESPECTIVE TRADES.

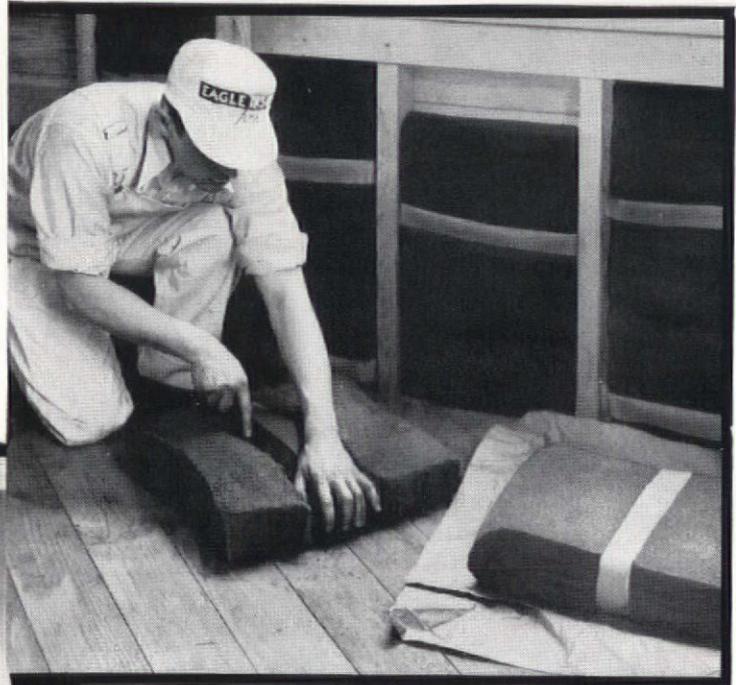
TWO WAYS

TO SECURE THICK, FIREPROOF INSULATION

With Eagle Bats

1

For new construction, Eagle Home Insulation comes in the form of Bats—insulating “pillows,” 15 inches by 18 inches in size, 3 3/8 inches thick. Quickly applied between wall studs, and between joists in the attic. Provides thick fireproof insulation of a vastly superior kind. Greatly increases living comfort, and decreases fuel costs.



2

With Eagle Home Insulation

—applied pneumatically ● For old construction, this is the convenient, easy, economical way to effect honest insulation. The application is made by a skilled operator, whose machine blows the “wool” into the empty wall and ceiling spaces, without muss, in little time, and at very reasonable cost.

● Both of these methods of applying Eagle Home Insulation result in remarkably increased home comfort—and fuel savings.

Eagle Home Insulation is *thick*—to be really and truly insulation. It is *fireproof*. It is easy to handle, clean. It is vermin proof.

You should have in your files full information—and free samples—of both forms of Eagle Home Insulation. The coupon will bring you this material without obligation.

The Eagle-Picher Lead Company, Dept. AR11, Cincinnati, Ohio. Please send me booklets and free samples of both forms of Eagle Home Insulation.

AR11

NAME _____

ADDRESS _____

CITY _____ STATE _____

MANUFACTURERS' ANNOUNCEMENTS

Architects are invited to use the coupon on this page as a convenient means of obtaining manufacturers' publications describing in detail the products and materials mentioned.

111 NEW TYPE AIR FILTER

The Multi-V-Type air filter, a product of Staynew Filter Corporation, is so named because it consists of a hinged arrangement of cells providing an active filtering surface 27 times the face area. A positive, dry fabric type filter medium is used. It is claimed that a 99.9 per cent dust separating efficiency is obtained and that the new type of construction employed adds from three to five months to the period of operation before cleaning is necessary. A folder, "Making Space Work," is available from the manufacturer, in which are described the capacities and filtering areas of individual cells and cell units. The folder also reviews the variety of applications and the simple, inexpensive cleaning process prolonging the life and efficiency of the filter element.

The Protectovent, a window ventilator unit is also announced by the Staynew Filter Corporation. This unit combines a motor-driven fan, air filter and silencing device. It may be easily and quickly installed in any vertically-sliding, double-hung window. A deflector silencing plate eliminates draft and permits deflection of air upward, downward, or both, as desired. It is especially adapted for office and for sick room use.

112 CARNEGIE CARBON STEELS

A sixty-page booklet by the Carnegie Steel Company tells about progress in their study of methods of controlling steel quality in the basic open hearth process. The booklet, which is fully illustrated, is divided into five parts. (1) Carbon Steel Quality Factors and the Need for Control; (2) Some Carbon Steels Manufactured by the Carnegie System of Control—Physical Properties of Different Types after Heat Treatment; (3) Importance of Controlled Steel Making to the Steel Consumer; (4) The Carnegie System for Controlling Quality Factors; (5) A Classified Bibliography.

To Obtain Further Information

about any products mentioned, indicate the number or name of product and send to THE ARCHITECTURAL RECORD, 119 West 40th Street, New York, N. Y.

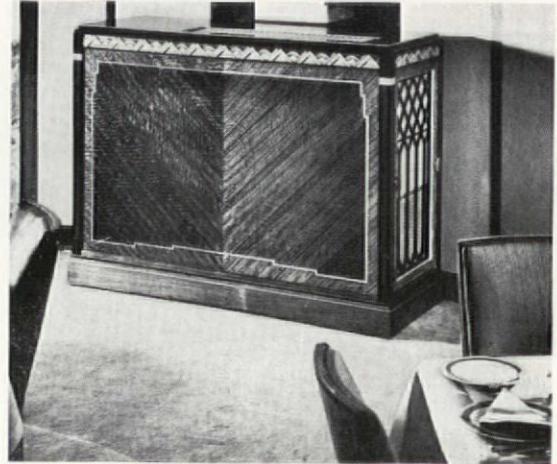
.....
.....

Name _____

Position _____

Street _____

City and State _____



113 A COMPACT AIR CONDITIONING UNIT

The De La Vergne Engine Company announces a new self-contained air conditioning unit for which several unique features are claimed. Developed for use in offices, retail establishments, hotels, clubs, homes, etc., it operates entirely by electricity, is air cooled, and requires no piping whatever, either for water or refrigerant. The unit employs the thoroughly proven compression refrigeration cycle for cooling and dehumidifying, and the new De La Vergne reverse refrigeration principle for warming and humidifying. To change it from a cooling unit to a heating unit requires only the turning of a lever. Freon, F12, is the refrigerant. It is used in a sealed compressor charged at the factory and requiring no further attention on the part of the owner. The unit is housed in a hardwood cabinet designed to harmonize with its surroundings. Installation is simple and inexpensive, requiring only an electrical outlet sufficient to carry 2 k.w. of electrical energy, and air ducts arranged under a partially raised window sash. Thus the unit is not permanently attached to the building and can be moved easily from one room to another as required. Where window space is not available it is possible to install ducts to outside air. Essentials of complete year-round air conditioning are claimed, namely: (1) Revitalization of room air through constant flow of fresh air from the outside; (2) Complete filtration, effecting the removal of dust, soot, pollen and other health destroying substances; (3) Cooling and dehumidifying or warming and humidifying; (4) Circulation of fresh, clean air at the rate of 600 cu. ft. per minute. When the temperature and humidity need no correction, the compressor can be switched off, leaving the circulating fan to function as a ventilator but continuing to filter the air circulated in the room.

Glass IN THE MODERN HOME



1 2
3 4

Large windows make a home cheerful and attractive. This is a view of the living room in the Lumber Industries house.

This unusual glass dressing table, with mirror, appears in the house constructed by the Common Brick Manufacturers Association.

Doors and windows, like these, are always effective. They are in the game room of the Stran-Steel Good House-keeping house.

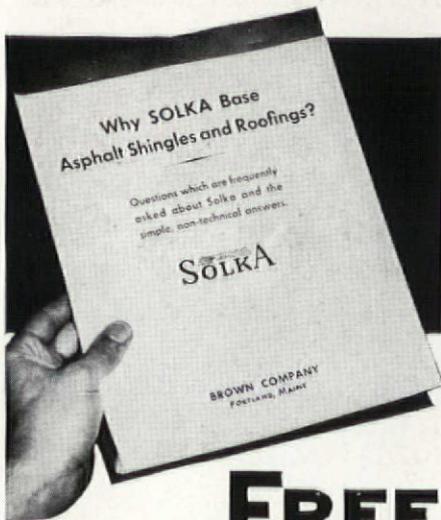
Glass almost covers the wall in the bedroom of the Florida Tropical House—a distinctive and decorative use of mirrors.

Glass, not only in windows, but in mirrors, panels, mirrored doors, table tops, decorative screens and Picture Windows, is fast becoming the keynote of contemporary architectural design. Nowhere is this illustrated more vividly than in the Home Planning Section at Chicago's World's Fair . . . and it is significant that, in these model houses, the flat glass is almost exclusively the product of Libbey-Owens-Ford. That proof of preference endorses our assertion that a closed specification for L·O·F Quality Glass will insure your clients' complete satisfaction.



LIBBEY·OWENS·FORD GLASS COMPANY, TOLEDO, OHIO, manufacturers of Highest Quality Flat Drawn Window Glass, Polished Plate Glass and Safety Glass; also distributors of Figured and Wire Glass manufactured by the Blue Ridge Glass Corp. of Kingsport, Tenn.

LIBBEY·OWENS·FORD QUALITY GLASS



FREE

This Valuable Roofing Bulletin Compiled Especially For Dealers, Architects And Appliers of Asphalt Roofings

BE sure to read this enlightening Bulletin, "Why Solka Base Asphalt Shingles and Roofings". Be informed how this improved cellulose base imparts to Asphalt Shingles and Prepared Roofings:

- 1. Longer Life**
- 2. More Flexibility**
- 3. Greater Strength**
- 4. Firmer Nail Grip**

Brief, concise, in question and answer form—this Bulletin gives you up to the minute Facts that all dealers, architects or appliers of roofing should know.



MAIL THE COUPON FOR YOUR FREE COPY NOW

BROWN CO. 5-11-33
Portland Maine

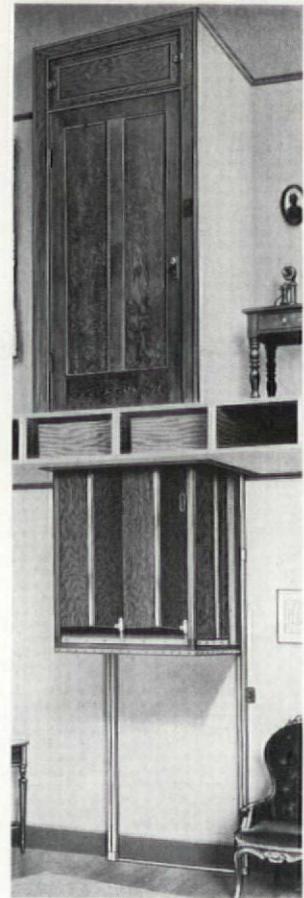
Please send your free Roofing Bulletin "Why Solka Base Asphalt Shingles and Prepared Roofings"—Also names of manufacturers who can supply my requirements.

Name.....

Address.....

114 INLAND 4-WAY FLOOR PLATE

A new folder on Inland 4-Way Floor Plate has just been issued by the Inland Steel Company, Chicago. It describes in detail the superiorities claimed for this product: (1) Projections exactly center one another at right angles and are slightly higher at the center, forming traction points. (2) The floor plate forms a continuous pattern throughout the length and breadth of the surface covered; there is practically no waste and the neat continuous pattern assures safety. (3) Projections overlap equally both crosswise and lengthwise forming a stiffening along both dimensions. (4) The plates may be swept, scrubbed or flushed in any direction, and they drain readily, a particular advantage in such plants as breweries and creameries. The manufacturers recommend its use especially for stairways, steps and walkways on machines, floors, sidewalk hatchways, etc. The folder also describes Inland 4-Way Traffic Plates, made from 4-Way Floor Plate.



facturer explains the many automatically operating safety devices employed.

115 WESTINGHOUSE GAS-ELECTRIC SETS

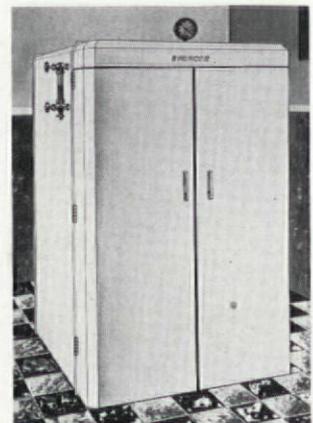
For continuous or emergency power supply to hotels, hospitals, schools, airports and to all other similar structures, Westinghouse gas-electric sets are available in a wide current capacity range. In a booklet "Gas-Electric Sets for Every Application" the manufacturer provides a condensed and well illustrated review both of air cooled and water cooled sets together with complete data on suitable types of control.

117 BOILER JACKET IN COLORS

A two-toned jacket as optional equipment for Spencer Magazine Feed Boilers is now being offered by the Spencer Heater Company, Williamsport, Pa., a division of the Cord Corporation. In addition to providing a safeguard against dust and dirt, the new jacket gives a touch of beauty to the boiler room, making available an additional recreation room in the home.

116 HOME ELEVATOR

The new Shepard HomeLIFT, electrically operated and designed for passage between two floors, requires only an opening in the floor and a nearby electric outlet for complete installation. Cost \$750. The motor is housed in the steel frame and is situated close to the ceiling of the upper floor. The elevator has a lifting capacity of over 350 pounds. Its floor area, in standard models, is 30" x 30". A folder prepared by the manu-



Now an additional reason
for specifying the
SPEAKMAN
ANYSTREAM
SELF-CLEANING
SHOWER HEAD
on all installations



K-3395—SPEAKMAN Anystream Self-Cleaning Shower Head. (Patented January 2, 1923 and November 3, 1931.)

When furnished with any type of Speakman Shower the Anystream Self-Cleaning Head will be supplied at only a slight additional cost over the regular head

IT ALLOWS A NORMAL, NEEDLE OR FLOOD SHOWER WITH THE TURN OF A HANDLE, AND WILL NEVER STOP UP!

FOR institutions, clubs, schools and hospitals, special types of Anystream Self-Cleaning Heads have been developed.

All are illustrated and described in our Bulletin K-57, which every architect should have. Complete with shower piping, layout data, and roughings-in on all special types of showers. As many copies as requested will be sent promptly.

SPEAKMAN COMPANY
Wilmington, Delaware

SPEAKMAN Showers & Fixtures

Refer to Sweet's Architectural Catalogs pages 2338-39-40



K-7047—SPEAKMAN Adjusta-Spray Shower Head. (Pat. November 3, 1931, March 15, 1932, June 4, 1932.)

Adjusta-Spray Shower Head

This is the small brother to the Anystream Self-Cleaning Head. It is another lower price development, made for a bather a choice of fine or coarse sprays. Measures $2\frac{1}{4}$ " across the face; the Anystream Head is $4\frac{1}{8}$ ".



**Cold-weather Concreting
without
Cold-weather Grief!**

The combined advantages of Solvay Calcium Chloride make winter concrete work practical and profitable . . .

THE simple addition of a little Solvay Calcium Chloride to the concrete mix gives you the following advantages:

- (1) Reduces (by about half) the time during which costly protection is required.
- (2) Lowers the freezing point of water.
- (3) Raises the temperature of the mass.
- (4) Gives to concrete the early strength required to withstand stresses caused by sudden temperature variations.
- (5) Permits early removal of forms.
- (6) Accelerates the initial set.
- (7) Produces denser, stronger concrete in the initial period.
- (8) Supplies the moisture needed for proper hydration evenly throughout the mass.
- (9) Permits prompt finishing and saves overtime.
- (10) Facilitates and speeds up actual finishing work.

This winter especially, you'll want to be more certain than ever that you get both *results* and *profits* out of every concrete job—large or small. Write for full information. Ask for booklet 1653.

SOLVAY SALES CORPORATION

*Alkalies and Chemical Products Manufactured by
The Solvay Process Company*

61 BROADWAY NEW YORK

SOLVAY

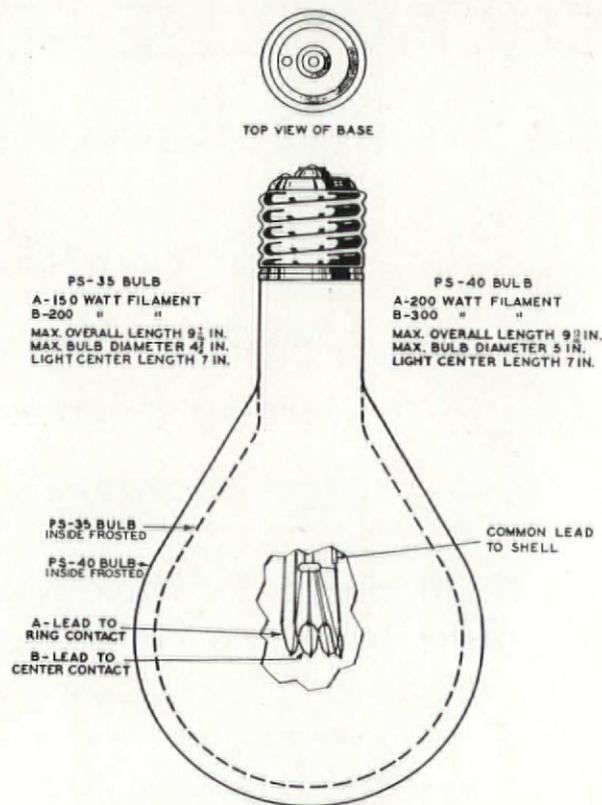
TRADE MARK REG. U. S. PAT. OFF.

Calcium Chloride

**118
STEWART FENCES**

Fences and gates of chain link wire and of iron for every purpose are illustrated in the new catalogue No. 75 released by The Stewart Iron Works Company, Inc., of Cincinnati, Ohio. Designs range from lawn fences for low-priced small houses to protective fences for industrial, cemetery, institutional and municipal properties. Catalogue No. 57 describes the complete line of link wire fences with additional facts about a selected group of iron fence designs. For both types of fence complete catalogues are available.

**119
REVOLUTIONARY THREE-LIGHT LAMP
ANNOUNCED BY GENERAL ELECTRIC**



A revolutionary lamp that provides three different levels of illumination from a single lamp bulb, thereby affording a flexibility in general lighting never before possible, has been announced by the Incandescent Lamp Department of General Electric Company at Nela Park, Cleveland, Ohio. The new Mazda three-light lamp contains two filaments, each of which may be burned either singly or in combination with the other. Each of these lamps is equipped with a mogul screw base which has an additional center contact in order to permit separate control of each filament. A special socket is necessary to accommodate this new base. Generally, the remainder of the lighting equipment, including the fixtures and fitting, need not be replaced if they have been satisfactory heretofore.

It is anticipated that the new lamp will find its first application in the field of commercial lighting,

Bargains in Books

Here is an opportunity to add one or more important reference books to your working library at a saving of 33⅓ to 50%.

Each one of these books is a standard on its particular subject and is well worth the original price. At the special price now quoted it's a real bargain.

THE AMERICAN HOSPITAL of the Twentieth Century, Third Edition—by Edward F. Stevens, who has himself planned more than 150 hospitals and institutions; describes the development of medical institutions in Europe and America; is the recognized authority on hospital planning and equipment; 550 pages, 660 illustrations and floor plans.
Price \$7.50 (instead of \$15.00).

POLYCHROMY—by Leon V. Solon with introduction by Ralph Adams Cram; the accepted authority on color in architecture and sculpture; profusely illustrated with reproductions of photographs and drawings, including nine plates in full color.
Price \$3.00 (instead of \$6.00).

SPANISH GARDENS AND PATIOS—by Mildred Stapley Byne and Arthur Byne—The first comprehensive, authoritative book on the subject in any language; over 300 pages; four beautiful color plates and 175 illustrations; quarto, in a box.
Price \$7.50 (instead of \$15.00).

SMALL MANOR HOUSES AND FARMSTEADS OF FRANCE—by Harold Donaldson Eberlein and Roger Wearne Ramsdell with introduction by Leigh Hill French, Jr.—a rare book of inspiration and information; frontispiece in color and 253 illustrations in half tone; over 300 pages; quarto, in a box.
Price \$7.50 (instead of \$15.00).

SMALLER HOUSES AND GARDENS OF VERSAILLES, from 1680 to 1815—by Leigh H. French, Jr. and Harold Donaldson Eberlein; more than 200 pages, 9 x 12 inches, with over 250 photographs, plans and measured details.
Price \$4.00 (instead of \$6.00).

PRINCIPLES OF CITY LAND VALUES, Fourth Edition—by Richard M. Hurd; 146 illustrations, including early pictures of Paris and of other foreign and 50 American cities; the principles it sets forth are sound and informative, and apply to changing conditions in all American cities.
Price \$2.00 (instead of \$3.50).

To Get The Benefit Of These Special Prices Please Mail Your Order At Once!

THE ARCHITECTURAL RECORD,
119 West 40th Street, New York.

A.R. 11-33

In accordance with your special offer, send me at once, all charges prepaid, the books checked, for which I enclose \$.....

Name

Address

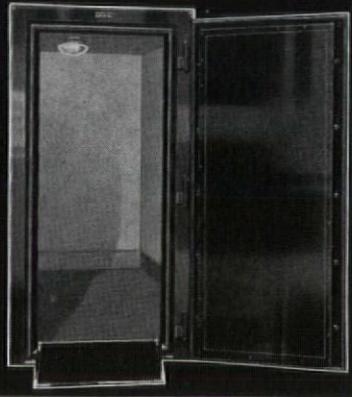
Profession..... Date.....

Special
Price

- The American Hospital*..... \$7.50
- Polychromy* 3.00
- Spanish Gardens and Patios* 7.50
- Small Manor Houses, etc.*..... 7.50
- Smaller Houses and Gardens* 4.00
- Principles of City Land Values*... 2.00

10 MINUTES

**BETWEEN
SUCCESS
AND
FAILURE**



THE foundation of every business is its paper records . . . accounts . . . inventories . . . maps . . . plans . . . plats . . . drawings . . . cost records . . . etc. A surprisingly large number of business houses and public officials are entrusting their vital paper records to vaults protected by doors the Underwriters' Laboratories would rate as ten-minute doors.

Many of these concerns have successfully struggled to balance their budgets with present income. Yet they would be compelled to instantly close their doors were these vital records destroyed. *And the difference between success and failure is the assumption that a fire can not last longer than ten minutes!*

Record vault modernization is sorely needed by government offices . . . banks . . . manufacturers . . . merchants . . . schools . . . office buildings. Old vaults need to be checked for defects in construction. Ten-minute doors should be replaced with Underwriters' labeled vault doors, one-half, two and six-hour doors. The most reliable guide for vault construction and door selection for all risks are contained in the Diebold section of Sweets' 1933 edition, pages C-843 to C-856; all based on N.F. P. A. reports. Refer to Sweets' or write for our catalog of facts.



Long known as a leading bank vault manufacturer Diebold offers complete protection for records, money and wealth from fire, burglary and banditry.

DIEBOLD SAFE & LOCK CO., Canton, Ohio:

() Please send your recommendation for vault construction and vault door selection.

Individual _____
City _____ State _____

DIEBOLD
SAFE & LOCK CO., Canton, Ohio
Over Seventy Years of Protection Service

particularly the small and medium-sized establishments which have definite peaks and low points in the volume of store traffic. With the new Mazda three-light lamps, it will be possible to use the lower wattage filament alone for minimum requirements, the higher wattage filament for average requirements, and the two together to supply the high level illumination needed for the active shopping periods. Department stores also will recognize the value of this flexibility feature. There are two wiring methods which may be used in installing the new lamps: (1) to run a 3rd wire from the lighting unit to the wall switch, thereby controlling both filaments from the wall; (2) to locate a canopy switch on the ceiling at each fixture. The new Mazda three-light lamp is inside-frosted. It is so designed as to give the same life in service as the regular Mazda lamps, approximately 1,000 hours.

120 NEW OVERHEAD STEEL DOOR

Being of steel construction and hollow metal design, the new Durabilt overhead door is fire-resisting and unaffected by moisture or changes in temperature. Dependable operation is claimed by virtue of the steel-incased compression spring employed as counterbalance operating in conjunction with two cables either one of which alone is capable of sustaining the weight of the door. All Durabilt models are completely weather-stripped. They are comprised of four or more horizontal sections, each section consisting of a steel tubular form to which a sheet steel covering is electrically welded. There are six or more panels to each section either solid or open for glass. These doors require only 6-inch headroom for standard installations. They are manufactured by Durabilt Steel Locker Company, of Aurora, Ill.

121 GLASS BLOCK AND GLASS-WOOL FILTER

In response to inquiries resulting from the exhibition of Owens-Illinois glass building blocks and the "Dustop" glass-wool air filter at the Century of Progress Exposition, the manufacturer of these two products has prepared a folder illustrating and describing the application of glass blocks for various types of buildings. The folder also contains essential information about the construction and uses of the Owens-Illinois glass-wool air filter which, it is claimed, removes over 96 per cent of all air impurities.

122 INLAND STEEL COMPANY

The Inland Steel Company, Chicago, has opened a sales office at 1511 Kirby Building, Dallas, Texas. This office will have charge of sales in the state of Texas, with the exception of the city of El Paso.

AMERICAN **USS**
STAINLESS
 AND HEAT RESISTING ALLOY STEEL

SHEETS
 AND LIGHT PLATES

AMERICAN
 SHEET AND TIN PLATE
 COMPANY
 PITTSBURGH
 MADE IN U.S.A.

In the Building Field

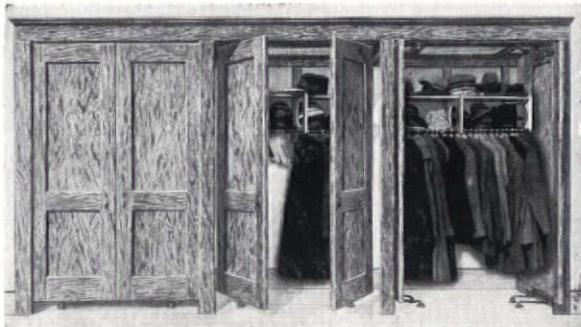
Insist upon **USS STAINLESS** Steel Sheets—produced in a number of grades and finishes, and adapted to a wide range of applications. Write for literature and full information on the following alloys—

USS CHROMIUM-NICKEL Steels, *Austenitic*: 18-8; 18-12; 25-12
USS CHROMIUM-ALLOY Steels, *Ferritic*: 12; 17; 27

USS Chromium-Nickel Alloy Steels produced under licenses of Chemical Foundation, Inc., New York; and Fried. Krupp A. G. of Germany.

This Company manufactures a full line of
 AMERICAN Black Sheets, Keystone Rust Resisting Copper Steel Sheets, Apollo Best Bloom Galvanized Sheets, Heavy-Coated Galvanized Sheets, Galvannealed Sheets, Formed Roofing and Siding Products, Automobile Sheets, Special Sheets, Tin and Terne Plates, etc. Write for further information.

AMERICAN SHEET AND TIN PLATE COMPANY, Pittsburgh, Pa.
 SUBSIDIARY OF UNITED STATES STEEL CORPORATION



EVANS
 "Vanishing
 Door"
 WARDROBE

Class J
 equipped with either "Floor" type (as illustrated) or "Jamb" type hinges. This is Class D wardrobe if made with flush doors.

CLASSROOM WARDROBES

High in Quality—Low in Cost

This type occupies a recess flush with the wall. Plaster back and ends. No partitions, but with mullions between pairs of doors. Wire mesh ceiling. Blackboards if required.

The "Vanishing Door" hinges on which the doors are hung are made with double pivoted arms and swing the doors back into the wardrobe entirely out of the way. Simple—trouble-proof—and last as long as the building.

Wardrobes are furnished complete in the knockdown, with all woodwork cut to size, and only need to be nailed in place. The hinges are easier to put on than common butt hinges. The entire cost of installation is small.

We make many other types of school wardrobes, fully illustrated and described in 1933 Sweet's, Volume C, pages 774-781.

W. L. EVANS
 WASHINGTON, INDIANA, U. S. A.

The
DURIRON
Code

NRA
 U.S.
 WE DO OUR PART

BENEFITS
EVERY ARCHITECT

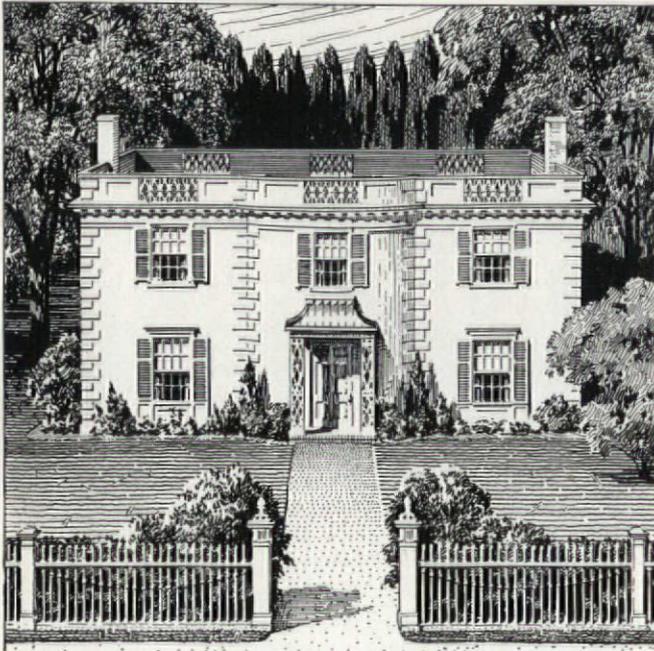
Architects have put their seal of approval upon the Duriron code of business ethics:

- They favor our one-price policy.
- They prefer helpful suggestions from Duriron trained and experienced engineers to the old-style high-pressure salesmanship.
- They find we furnish valuable cooperation in the layout of acid waste lines, ventilating installations, and everywhere that corrosion problems must be solved.
- They know that we make good our promises.
- They are always confident that we will protect them in their relations with client and contractor.

Are you familiar with the complete line of Duriron products? See our Catalog in Sweet's or write for specific information.

THE DURIRON COMPANY, Inc.
 404 N. Findlay St. Dayton, Ohio

DURIRON
ACID PROOF
DRAIN PIPE



Sketch of "The House of Years" built and decorated by W. & J. Sloane and featured in the October issue of House & Garden. Architects, Henry O. Chapman, Jr. & Harold W. Beder, New York.

Painted with "Collopakes" Inside and Out

ON WINDOWS, shutters, trim, ornamental ironwork, walls and doors — inside and out — everywhere paint was needed in this model house, Cabot's Collopakes were used.

Collopakes are modern colloidal colors, made by a patented process. They mark a new era in painting, giving a beautiful and lasting finish to shingles, brick, stone, iron, wood or plaster. Their texture is finer, their color values richer. They are economical to use, because of their great covering power which makes fewer coats necessary, and because of their non-fading qualities and unusual durability.

The coupon below will bring you color card and full information.

Cabot's Collopakes

FOR EVERY PAINT USE

Made by the Makers of Cabot's Creosote Shingle and Wood Stains

Samuel Cabot
Inc.
Manufacturing Chemists



141 MILK STREET
Boston, Massachusetts

Gentlemen: Please send me Color Card and information on Cabot's Collopakes.

Name.....

Address.....

AR-11-33

123 NEW ELECTRIC ELEVATOR FOR RESIDENCES

An electric elevator suited to residences or to any light, one-floor rise duty is announced by The Warner Elevator Mfg. Co., of Cincinnati. A heavy vertical threaded steel column raises and lowers the platform and also acts as support for the car. This supporting column or screw is driven by a nut connected to the motor through a double "V" belt. The driving mechanism, consisting of a single-phase motor operated from the lighting circuit, is located in the cellar. No overhead machinery or sheaves being required, installation involves no alteration of the second-floor ceiling.

124 FIREPROOF CONCRETE CONSTRUCTION

The Portland Cement Association offers three booklets discussing fireproof concrete construction for private residences, particularly small homes. Suggested designs for entire homes with special reference to the use of concrete for floors are contained in these booklets.

125 YORK ANNOUNCES NEW AIR COOLED FREON CONDENSING UNIT

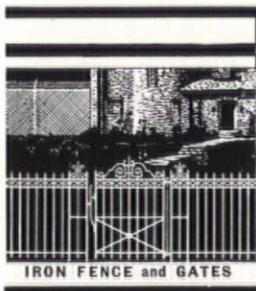
A new air-cooled Freon condensing unit, designed to meet circumstances where water-cooled condensers cannot be used, has been developed by the York Ice Machinery Corporation, of York, Pa. The new unit is now in production in capacities of 1, 1½ and 2 h.p. It is designed to operate at evaporator temperatures up to 45°F., a suction temperature frequently required for air conditioning work, and is especially adapted for use in circumstances where the cost of water is prohibitive; where the disposal of water is a problem; where the water supply is not cold enough to do an effective job, and where the water is corrosive. The new air condenser is mounted in front of the compressor and motor.

Operation is controlled by means of a suction pressure switch mounted on the unit, this incorporating an overload safety device. A magnetic relay switch is on the unit and is completely wired to the motor and controls, eliminating this work in the field. The unit runs at slow speeds but having large fan capacity and ample condenser surface, provides maximum cooling capacity.

TRADE ANNOUNCEMENT

VICTOR S. PEARLMAN

Victor S. Pearlman Corporation, designers and dealers in art light fixtures, have removed their studios, shops and display rooms to 208 North Michigan Avenue from their former South Wabash location. The Pearlmans have done the installations in literally hundreds of hotels, theaters, churches, clubs, and private residences in Chicago, New York and cities from coast to coast.



IRON FENCE and GATES

STEWART FENCES

*accentuate
Architectural Beauty*

Fencing has become more and more popular since Stewart has created designs to fit into the general architectural scheme with perfect harmony. For 47 years Stewart has worked with leading architects, to the mutual satisfaction of all concerned.

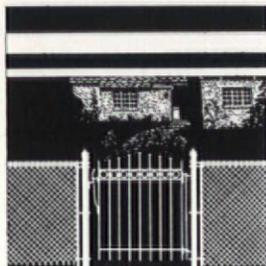
The Stewart catalog and the local Stewart office should be noted in your files. If it isn't drop us a line.



See Stewart pages in Sweet's Catalog.

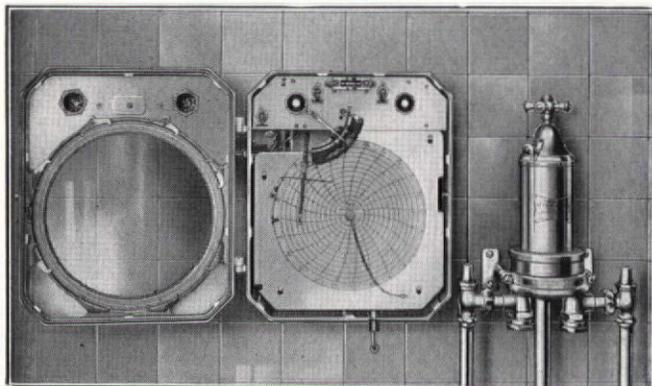
Stewart IRON and WIRE
FENCES

The Stewart Iron Works Co., Inc.
919 Stewart Block
CINCINNATI, OHIO



CHAIN LINK WIRE FENCE and GATES

Continuous Flow Baths



Leonard HYDRIATRIC Suite

Reg. U. S. Pat. Off.

When you specify a Leonard Hydriatric Suite you have a choice of six designs in cases and

twelve different combinations.

Write for catalogue F which is Standard A. I. A. File size.

In Sweet's Catalogues

Manufactured by

LEONARD-ROOKE CO.

INCORPORATED

Providence, Rhode Island

NOBODY WILL CARE whether thermometers RISE or FALL

HOT or cold, wet or dry, bright or dull the weather may be, but modern engineering provides atmosphere and light suited to requirements anywhere, any time.

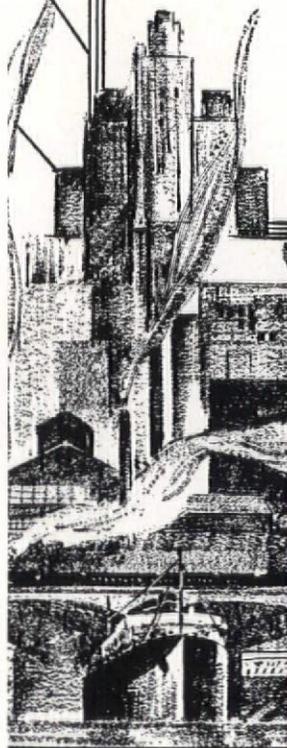
Heating, ventilating, air-conditioning and lighting science make the modern indoors independent of nature's disturbing vagaries.

Out of this great advance—accelerating month by month—has come a variety of equipment, appliances, methods, materials, tools, instruments and supplies practically unknown a year or so ago.

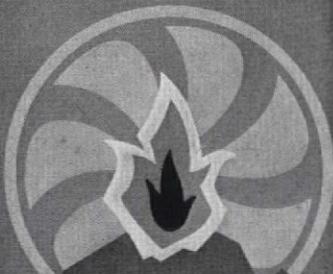
The men who will seize the rich opportunities for leadership awaiting them in this active sphere will be those who keep abreast of developments. To that end, they will visit the INTERNATIONAL HEATING & VENTILATING EXPOSITION to be held in February at New York under the auspices of the American Society of Heating & Ventilating Engineers.

You, too, will be there?

You will find yourself handicapped otherwise. Visitors are sure to find a wealth of information and ideas that can be capitalized handsomely and quickly.



SEE OUR EXHIBIT

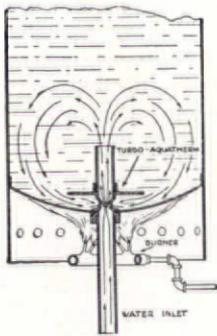


THIRD
INTERNATIONAL HEATING &
VENTILATING EXPOSITION

GRAND CENTRAL PALACE
NEW YORK-N.Y.

February 5-9-1934

A NEW INVENTION!



THE TURBO

A new Dahlquist patent which prevents mud from accumulating in the boiler and does away with costly burn-outs.

SAVES GAS



Super Aquatherm Gas Underfire

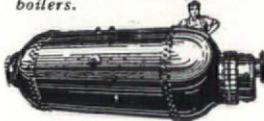
water clean. The patented Turbo placed in all Dahlquist boilers uses 50% less gas, and gives a continuous supply of clean, fresh sediment-free hot water day and night.

DAHLQUIST - TURBO Does away forever with Discolored and Dirty Hot Water

In these days of new inventions your trade won't stand for dirty, discolored, rusty hot water. They insist on the best and you can give it to them if you sell Dahlquist copper range boilers and hot water storage systems equipped with the TURBO.

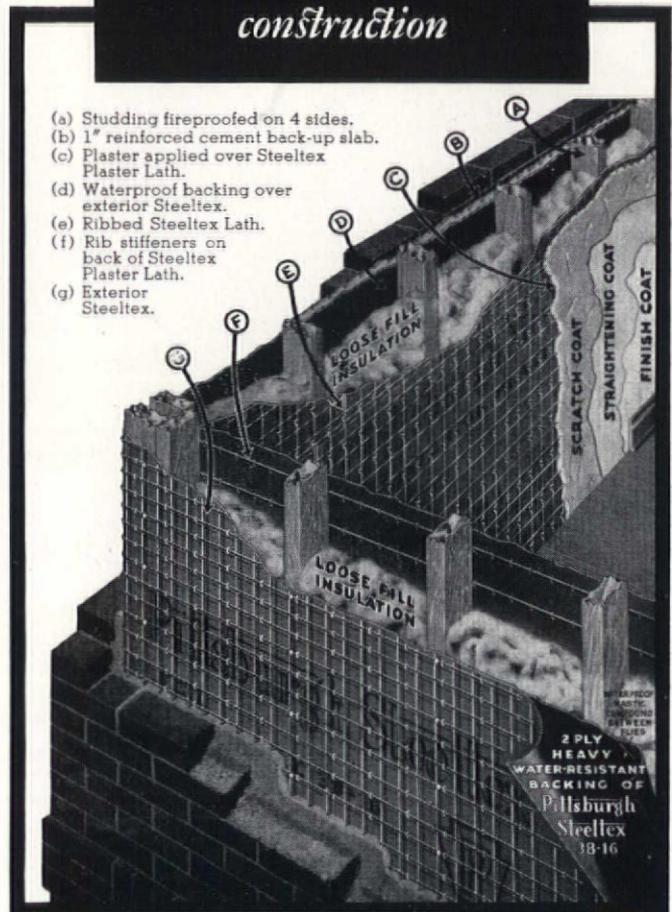
The TURBO is Theodore W. Dahlquist's latest invention. It prevents sediment from forming on the boiler bottom—reduces cost of gas—prevents costly burnouts—and keeps hot

Write for Particulars
Architects and heating engineers may rely entirely on Dahlquist workmanship and experience, whether for range boilers, automatic storage boilers or heavy pressure boilers.



DAHLQUIST MFG. COMPANY
50 West 3rd St. So. Boston, Mass.

The new ideal demands SUPER-WALL construction



- (a) Studding fireproofed on 4 sides.
- (b) 1" reinforced cement back-up slab.
- (c) Plaster applied over Steeltex Plaster Lath.
- (d) Waterproof backing over exterior Steeltex.
- (e) Ribbed Steeltex Lath.
- (f) Rib stiffeners on back of Steeltex Plaster Lath.
- (g) Exterior Steeltex.

SPECIFY MONEL METAL

... it assures the high quality of
Hospital Equipment

● Whenever you specify that hospital equipment be made of Monel Metal, you can rest assured that it will have quality built right into it. The presence of silvery Monel Metal is your assurance of inherent cleanliness and lasting durability. ● Whether you are building a new hospital or remodeling an old one, be sure to specify Monel Metal for food service, laundry, clinical and built-in cabinet equipment. Send for literature.

THE INTERNATIONAL NICKEL COMPANY, INC.
67 WALL STREET NEW YORK, N. Y.



Monel Metal is a registered trade-mark applied to an alloy containing approximately two-thirds Nickel and one-third copper. Monel Metal is mined, smelted, refined, rolled and marketed solely by International Nickel.



Pittsburgh Steeltex

PITTSBURGH STEEL CO. • Pittsburgh, Penna.

Gentlemen: Please send me: Information Prices on Pittsburgh Steeltex: Interior Lath Exterior Stucco Base Partitions Floor Lath Have your representative call

Name

Address

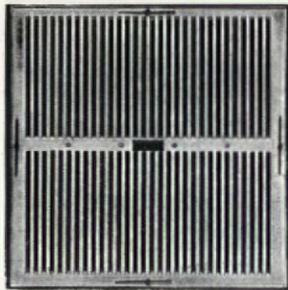


Tests made by the U. S. Weather Bureau in St. Louis showed 17,600 particles of dust per cu. ft. of air. That means the average person inhales a tablespoon of dust and soot every 24 hours. And that dust often contains germs of typhoid fever, tuberculosis, influenza, etc., is proven by tests made in a Boston Hospital, which showed nearly 450 living bacteria in 10 liters of air.

Prevent dangerous bacteria from spreading disease by installing Protectomotor Panel Air Filters in your buildings. They also prevent dust from ruining products and save building owners thousands of dollars yearly now spent to clean, paint and replace furnishings, etc.

The Protectomotor positively keeps 99-9/10% of the dust and soot out of buildings. No oil drains or cleaning tanks are required.

This filter operates about 2 months without cleaning and can be cleared in about half a minute per panel with our vacuum cleaner.

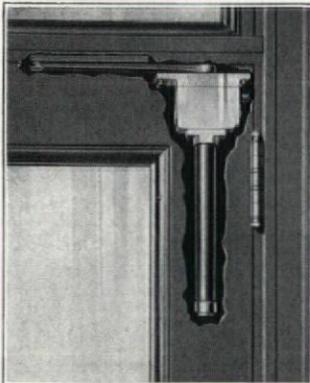


Write for our catalog.

Staynew Filter Corp.
4 Leighton Avenue
Rochester, N. Y.

PROTEGOMOTOR
REG. U. S. PAT. OFF.
99% Per Cent
AIR FILTERS
EFFICIENT

The HANDSOMEST DOOR CHECK EVER INSTALLED



● Yes! handsome because it is completely out of sight. The Rixson No. 100 replaces the unsightly, dust collecting mechanisms that break the symmetry of attractive walls. Yet its action is equally positive—even more reliable as it can't be tampered with.

Designed especially for hollow metal doors 1½ in. or greater in thickness; may also be specially mounted on wood doors. It has double checking regulation by two valves; is non-handed. Write for descriptive literature.

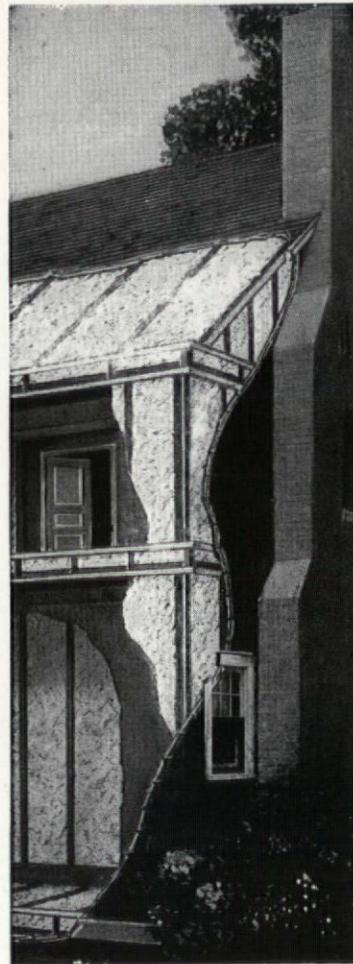
THE OSCAR C. RIXSON CO.

4450 CARROLL AVE., CHICAGO, ILL.

NEW YORK OFFICE: 2034 WEBSTER AVE.

PHILADELPHIA ATLANTA NEW ORLEANS SAN FRANCISCO

RIXSON
HARDWARE SPECIALTIES



INSULATE WITH U. S. MINERAL WOOL

A building without insulation is neither economically built nor fully protected from the elements.

U. S. Mineral Wool supplies the most effective of all insulating materials. It is lowest in thermal conductivity (6.3 B. T. U.), reduces fire hazard, deadens sound, thoroughly repels heat and cold and is vermin proof.

In specifying U. S. Mineral Wool you assure better protection and greater comfort and you do it economically.

Free sample and folder sent on request, address nearest office.

**U. S. MINERAL
WOOL COMPANY**

280 Madison Avenue
New York

Western Connection
Columbia Mineral Wool Co.
South Milwaukee, Wisc.

We Will Pay 25 Cents Each and
Postage Charges for These Numbers
of THE ARCHITECTURAL RECORD
if Sent before December 1st, 1933

OCTOBER, 1932

JANUARY, 1933

MARCH, 1933

JUNE, 1933

AUGUST, 1933

THE ARCHITECTURAL RECORD
119 West 40th Street
New York, N. Y.

**Get This Valuable
Reference Book at one
half the former price**

THE
AMERICAN HOSPITAL
of the
TWENTIETH CENTURY

by
EDWARD F. STEVENS, Architect

formerly \$15.00 a copy
NOW ONLY \$7.50

THIS standard reference book is the recognized authority on Hospital Planning and Equipment. Every architect who designs a hospital will find it an invaluable source of information.

The author, a Fellow of The American Institute of Architects and a Member of The American Hospital Association, has himself planned more than 150 hospitals and institutions and is known both in this country and abroad as a leading architectural authority on buildings of this type.

He has approached his subject from the most practical standpoint, selecting with discrimination and discussing in full detail all the problems involved.

He takes up every ward and department of a modern hospital, including the Kitchen and Laundry, and devotes special chapters to Heating, Ventilation and Plumbing, Details of Construction and Finish Equipment, Landscape Architecture as applied to Hospitals, etc., etc.

550 pages—with 660 illustrations and floor plans.

**Special Price—for a Limited Period
\$7.50**

THE ARCHITECTURAL RECORD
119 W. 40th St., New York

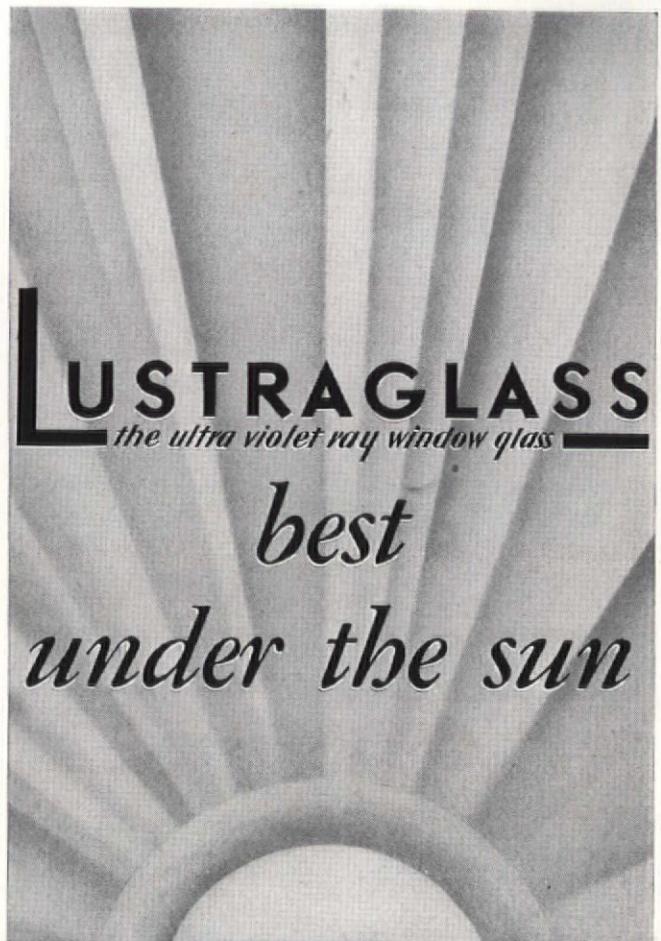
A.R. 11-33

In accordance with your special offer, send me one copy of Stevens' American Hospital of the Twentieth Century, for which I enclose \$7.50.

Name.....

Address.....

City and State..... Date.....



Unquestionably the value of a window glass lies in its transparency . . . Whether Lustraglass is new or has been used for years, it's still the whitest of all glass made for windows . . . It is a clearer, flatter, more lustrous product, superior in every respect, transmitting more daylight and a substantial amount of the shorter (more valuable) ultra-violet rays of sunlight . . . With all these extra advantages Lustraglass costs no more than ordinary window glass . . . It gives you maximum sunlight per dollar.

**AMERICAN
WINDOW GLASS CO.
PITTSBURGH • PENNA.**

Also makers of Lustrawhite Picture Glass, Armor-Lite Safety and Bullet-Proof Glass, Photographic Dry Plate Glass, 3/16" and 7/32" Crystal Sheet Glass, Ground, Chipped and Bulb Edge Glass.

Why News

ALFREDO BARELLI JR.
ASSOCIATE ARCHITECT

J. WILMARTON HUMPHREYS
ASSOCIATE

A. TEN EYCK BROWN, A. I. A.
ARCHITECT
122-21 22-23-25 FORTY-THIRD BUILDING
ATLANTA, O. A.

September 18, 1933.

F. W. Dodge Corporation,
313 Red Rock Bldg.,
Atlanta, Georgia.

Attention: Mr. L. E. O'Sarr

Gentlemen:

This is to advise that the Dodge Reports' service has, in my opinion, been of the most practical assistance to the whole building industry and has helped immeasurably in systematizing the distribution of valuable and timely information.

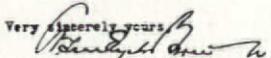
During my practice of over thirty years, I have had occasion to depend upon the cooperation of your organization and I have always received the most prompt and courteous handling in reference to every inquiry.

The above situation has also been greatly added to by Sweet's Architectural Catalogue and data in detail required and this splendid system has always made such information quickly and definitely accessible.

I wish to take this opportunity to appreciate the cooperation that I have received from your representatives, as I have found that they have always used any information that I might give them with discretion and have often been very helpful under various conditions.

Hoping the splendid work that your organization is doing will continue to benefit the building industry in the future as it has in the past, I am

Very sincerely yours,



ATEB/c

Dodge Report service on building and engineering operations, established in 1892, covers the 37 states east of the Rocky Mountains. Welcome the Dodge reporter when he calls. Ask him to tell you how he can serve you.

In This Series We Have Been Privileged To Publish Letters From:

Walker & Weeks

Penrose V. Stout

Guilbert & Betelle

The Ballinger Co.

Granger & Bollenbacher

Mauran, Russell & Crowell

Frank Irving Cooper Corporation

Smith & Senter

Holabird & Root

Albert Kahn, Inc.

Starrett & Van Vleck

George Ernest Robinson

Sturgis Associates, Inc.

Weiss, Dreyfous & Seiferth

Childs & Smith

Gordon & Kaelber

Paul Philippe Cret

Geo. B. Post & Sons

Kohn & Butler

Wyatt C. Hedrick

Delano & Aldrich

John Ebersson, Inc.

Warren, Knight & Davis

Robert O. Derrick, Inc.

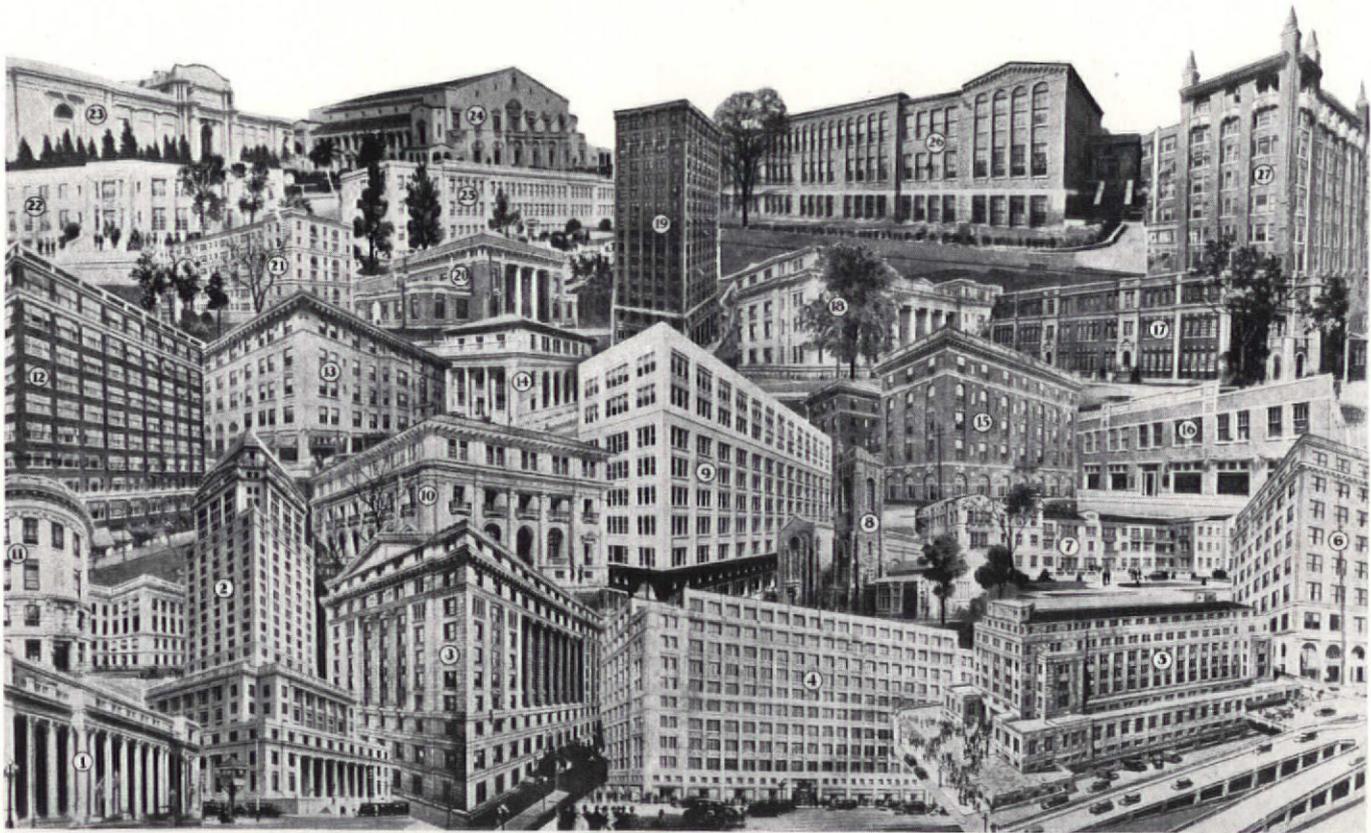
Lockwood Green Engineers, Inc.

DODGE REPORTS

ISSUED DAILY
By » » »

A. Ten Eyck Brown Gives To Dodge Report Service

The interesting composite picture reproduced below shows the principal commissions in the Southeastern states executed during the past few years by the office of A. Ten Eyck Brown, A. I. A., Alfredo Barili, Jr., and J. Wharton Humphreys, Associate Architects, of Atlanta. At present this office is at work on the Atlanta City Auditorium, a city prison and three libraries. We are glad of opportunity to recognize this outstanding firm and to express our thanks for the commendatory letter shown on the facing page.



- 1—Federal Reserve Bank, Atlanta, Ga.
- 2—Dade County Court House and Miami City Hall, Miami, Fla.
- 3—Fulton County Court House, Atlanta, Ga.
- 4—Ten Pryor Street Building, Atlanta, Ga.
- 5—U. S. Post Office, Atlanta, Ga.
- 6—Commercial Bank & Office Building, Greenwood, S. C.
- 7—F. C. Whatley Apartments, Miami, Fla.
- 8—First Presbyterian Sunday School and Tower, Atlanta, Ga.

- 9—Volunteer Building, Atlanta, Ga.
- 10—Federal Land Bank, Columbia, S. C.
- 11—New Orleans Court House, New Orleans, La.
- 12—Western Union Building, Atlanta, Ga.
- 13—General Forest Hotel, Rome, Ga.
- 14—Federal Reserve Bank of Atlanta—Branch, Jacksonville, Fla.
- 15—Georgian Hotel, Athens, Ga.
- 16—Crane Company Warehouse, Atlanta, Ga.
- 17—Newberry High School Building, Newberry, S. C.
- 18—Clarke County Court House and Jail, Athens, Ga.

- 19—Citizens & Southern Bank, Atlanta, Ga.
- 20—Municipal Building and Auditorium, Rome, Ga.
- 21—St. George Apartments, Atlanta, Ga.
- 22—State Highway Beard Building, Atlanta, Ga.
- 23—Mausoleum, Atlanta, Ga.
- 24—Miami Coliseum, Coral Gables, Fla.
- 25—Teachers Training School Building, Western Kentucky State Normal, Bowling Green, Ky.
- 26—Hoke Smith Junior High School, Atlanta, Ga.
- 27—Forsyth Theatre & Office Building, Atlanta, Ga.

F. W. DODGE CORPORATION, 119 West 40th St., New York



INDEX TO ADVERTISEMENTS

The italic lines appearing under the following manufacturers' names give the volume and catalogue page numbers of their catalogues filed in the 1933 Edition of SWEET'S ARCHITECTURAL CATALOGUES

A	L
AIR REDUCTION SALES CO. 11	LEONARD-ROOKE CO. 35
ALUMINUM CO. OF AMERICA 5	<i>D 266</i>
<i>A 615, A 822, C 148</i>	LIBBEY-OWENS-FORD GLASS CO. 27
AMERICAN SHEET & TIN PLATE CO. 33	<i>D 263</i>
Subsidiary of U. S. Steel Corp.	LIQUID CARBONIC CORPORATION 44
AMERICAN STEEL & WIRE CO. 4	<i>C 868</i>
Subsidiary of U. S. Steel Corp.	O
<i>A 152, B 537, D 592, D 862</i>	OTIS ELEVATOR CO. 19
AMERICAN WINDOW GLASS CO. 39	<i>D 812</i>
<i>C 260</i>	P
ARCHITECTS' ANNOUNCEMENTS 16	PITTSBURGH PLATE GLASS CO. 6
ARCHITECTURAL RECORD 31-36-38-39	<i>C 207</i>
B	PITTSBURGH STEEL CO. 37
BOOK REVIEWS 12-14	<i>A 163, B 587, C 928</i>
BROWN COMPANY 28	PORTLAND CEMENT ASSOCIATION 4th Cover
C	PUBLISHER'S PAGE 18
CABOT, SAMUEL, INC. 34	R
<i>B 410, B 634, C 149</i>	REPUBLIC STEEL CORP. 21
D	<i>A 628, A 865, C 461, D 108, D 606</i>
DAHLQUIST MFG. CO. 37	REYNOLDS METALS CO., INC. 9
<i>D 195</i>	RIXSON, OSCAR C., COMPANY 38
DIEBOLD SAFE & LOCK CO. 32	<i>C 374</i>
<i>C 843</i>	RUBEROID CO., THE. 23
DODGE REPORTS 40-41	<i>A 554, A 599</i>
<i>A 111</i>	S
DURIRON COMPANY, INC. 33	SCOVILL MANUFACTURING CO. 15
<i>D 144</i>	SOLVAY SALES CORP. 30
E	<i>A 293</i>
EAGLE-PICHER LEAD CO. 25	SPEAKMAN COMPANY 29
<i>B 740, C 168</i>	<i>D 270</i>
EVANS, W. L. 33	SPENCER TURBINE CO. 43
<i>C 774</i>	<i>C 645</i>
G	STAYNEW FILTER CORP. 38
GENERAL ELECTRIC CO. 2nd Cover	STEWART IRON WORKS CO., INC. 35
<i>D 612, D 619, D 686, D 786</i>	<i>C 831, C 930</i>
GENERAL ELECTRIC CO. SPECIALTY APPLIANCE	STRUCTURAL GYPSUM CORP. 13
SALES DEPT. 3	<i>A 198, A 431, B 624, C 119</i>
<i>D 786</i>	SWEET'S CATALOGUE SERVICE 8
GRAYBAR ELECTRIC CO. 2	Division of F. W. Dodge Corporation
<i>D 638, D 738, D 766</i>	T
H	TRUSCON STEEL CO. 36
HEATING & VENTILATING EXPOSITION 35	<i>B 313</i>
I	U
INTERNATIONAL NICKEL CO., INC. 37	UNITED STATES MINERAL WOOL CO. 38
<i>A 863, C 609, C 617, C 841, C 876, D 298</i>	<i>B 748</i>
J	UNIVERSAL ATLAS CEMENT CO. 10
JONES & LAUGHLIN STEEL CORP. 7	Subsidiary U. S. Steel Corp.
<i>A 160, A 716, A 767, D 106</i>	V
K	VONNEGUT HARDWARE CO. 17
L	<i>C 430</i>
M	W
N	WESTERN ELECTRIC 2
O	<i>D 730</i>
P	WESTINGHOUSE ELECTRIC & MFG. CO. 3rd Cover
Q	<i>C 112, C 603, C 814, D 194, D 624, D 659, D 765, D 800</i>
R	
S	
T	
U	
V	
W	

Modernize with Modern Cleaning Methods..



Expensive rugs are easily cleaned.



Walls are freed from dirt and the finest dust.



Special tools clean radiators and hidden spots.

THE new skylines of our large cities are crowded with the towers of hotels, office and bank buildings that are cleaned with the Spencer Central Cleaning System.

These are all attractive and busy buildings—and the cleaning costs are unquestionably low.

You can make an old building attractive to customers and tenants by making it clean—you can repay the investment by the saving in cleaning labor—by installing the Spencer System when you remodel or repair.

The advantages of low-cost positive cleanliness are greater today than ever before.

The Spencer System provides a powerful vacuum on every floor and deposits dirt and dust in a closed receptacle in the basement. (For details see Sweet's Architectural Catalog.)

Let us send you a booklet giving facts concerning the kind of a building you are interested in.

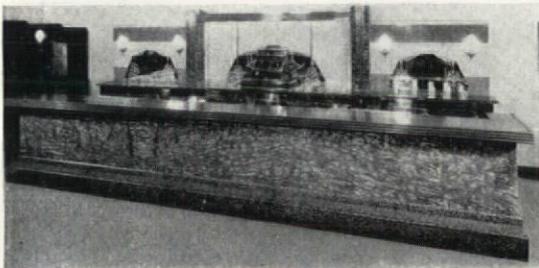


The open end cleans mattresses, furniture, etc.

SPENCER CENTRAL CLEANING SYSTEM



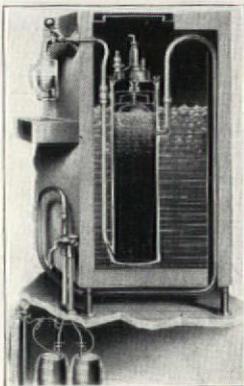
**BAR INSTALLATIONS
MEAN NEW JOBS
FOR THE ARCHITECT**



With new tap rooms being planned day by day, new opportunities for the architect are being created—to apply design and instill atmosphere into otherwise haphazard installations. Some very fine things will be done in expressing the spirit of hospitality and good fellowship.

The Liquid Carbonic Corporation freely offers its extensive facilities in cooperation with established architects. Our experts in rare woods and natural marbles—both designers and craftsmen—can aid in bar layouts. Our technical departments will gladly assist with installation and equipment details.

The complete "Liquid" line includes every type of equipment from stock or custom-built bars to beer fittings and brass goods. Write for descriptive literature and permit us to refer you to our nearest branch office.



The Liquid-Zahn Controlled Pressure Beer Drawing System available in all types of Liquid Dispensing Units. Always uniform draw. Right temperature, correct collar. No special skill required. More steins per barrel.



Complete Beer *Liquid* Drawing Equipment

THE LIQUID CARBONIC CORPORATION

3100 S. KEDZIE AVENUE, CHICAGO, ILL.

Chicago Salesroom: 619-621 South Wabash Avenue

Branches in 37 Principal Cities in the United States and Canada + London, England + Havana, Cuba



MORE LIGHT

BETTER LIGHT



with

Magnalux Luminaires

INVESTIGATION has shown that 87 per cent of America's commercial buildings have inadequate illumination.

In many of these buildings, a complete revamping of the electrical system is necessary to bring the lighting up to present-day standards. In others, a mere change from obsolete, inefficient fixtures to Magnalux luminaires will result not only in more light, but in the better light that meets all the requirements of modern lighting practice.

Magnalux luminaires distribute light evenly on the ceiling and also softly diffuse it through thick, dense

basins of Galax glass that permit no glare. So accurately is the light distributed that even the basins themselves blend harmoniously into the ceiling.

They have an unequalled efficiency of more than 90 per cent of the lamp output . . . no other semi-indirect lighting fixture delivers as much light at the desk level.

Magnalux luminaires are smart, distinctive and modern. They can be furnished in plain and ornamental designs for either semi- or totally-indirect illumination and are at home in any surroundings.

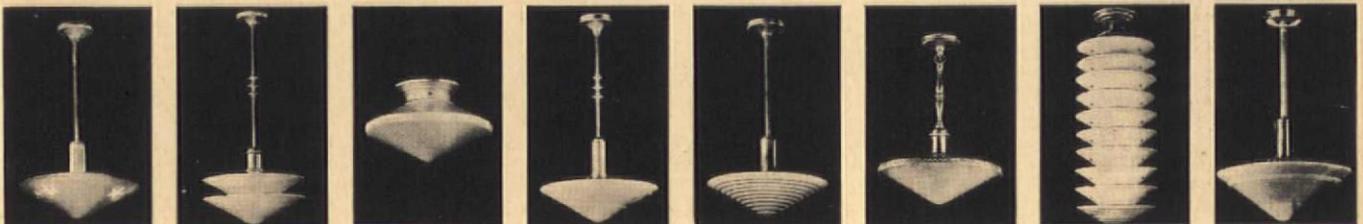
The Westinghouse office near you will gladly furnish complete information.

T 79761

WESTINGHOUSE
ELECTRIC & MANUFACTURING COMPANY



COMBINATION POSSIBILITIES OF MAGNALUX LUMINAIRES



A CONCRETE STRUCTURE

Dedicated to Ideals of Beauty and Permanence



"Build for the Ages"—commanded the sponsors of Memorial Terrace Mausoleum. Perpetual care and upkeep were pledged to purchasers of crypts. Durability—combined with beauty—was vital to the financial and artistic success of the venture.

To meet these requirements, the builders *selected* concrete—mixed and placed with intelligent regard for details which control its strength, endurance, and appearance.

For interior as well as exterior, concrete was formed into panels, pilasters, molded ornament and coffered ceilings—stained and colored to desired tones.

Here is convincing proof that architectural and structural uses of concrete may be freely blended.

Information on request.

● *Memorial Terrace; mausoleum—columbarium; Forest Lawn Memorial Park, Glendale, Calif.; Frederick A. Hansen, Architectural Supervisor; D. C. Allison, Consulting Architect.*



P O R T L A N D C E M E N T A S S O C I A T I O N

Room 2811 * 33 West Grand Avenue * Chicago, Illinois