JANUARY 1931

PENCIL POINTS
A JOURNAL FOR THE DRAFTING ROOM

35 CENTS A COPY

22,000 COPIES OF THIS ISSUE PRINTED
ARCHITECTURE’S LATEST ALLY IN MODERN BUILDING DECORATION

The lustrous beauty of Republic Enduro strikes a new note in building decoration. A modest grill in store front or elevator door—long ribbons of silver whiteness relieving the gray monotony of a ninety-storied building—a huge dome glittering in the sunlight like the facets of a giant jewel atop a modern skyscraper—Republic Enduro lends its permanent beauty to every type of use.

As made by Republic, world’s largest manufacturer of alloy steels, Enduro Nirosta is impervious to atmospheric attack, non-tarnishing, strong and ductile. It can be bent, tapped, threaded, flanged, welded, drawn, spun, stamped, worked in relief or repoussé. It can be given a mirror-like polish or finished to the feel of soft satin. Republic Enduro merits your consideration when the modern touch will lend distinction.

Atlantic Terra Cotta WALL UNITS used for exterior facing in combination with decorative Terra Cotta, also for interior wall surfaces.

WALL UNITS of
ATLANTIC TERRA COTTA

An entirely NEW development

Atlantic Wall Units are made mechanically to standard size. They possess every advantage of hand made Terra Cotta, but cost less to produce on a quantity basis. Atlantic Wall Units are quickly and easily erected with a considerable saving in labor. And there is a glorious array of colors to choose from—literally hundreds of colors—the entire Atlantic color line. Atlantic Wall Units are particularly adapted for interiors, but can also be used for exterior facing in combination with decorative Atlantic Terra Cotta as in the case of the building illustrated above.

When planning your next building, consider Atlantic Wall Units for lining the lobbies and corridors. These Units, although a new development, are already replacing less durable materials and far more expensive materials. Splendid too, for lining garage interiors, subways and tunnels, and for driveways as in the new Waldorf Astoria Hotel.

In writing for catalog please specify "Wall Units".

ATLANTIC TERRA COTTA CO.
19 West 44th Street, New York

PHILADELPHIA, PA.
NEWARK, N. J.
DALLAS, TEXAS

ATLANTA TERRA COTTA COMPANY
Atlanta, Georgia
PRODUCING "talkies" at the Metro-Goldwyn-Mayer Studios at Culver City, Calif., requires over $11,000,000 of property. Complete protection against fire is essential — that's why A. D. T. Central Station Watchman Supervisory and Fire Alarm Service is employed.

The margin of safety is greater with A. D. T. — every move of the watchmen is constantly supervised — fire alarms promptly transmitted directly to the fire department.

There are A. D. T. protection services for operation through A. D. T. Central Stations or for owner operation. See our catalog in Sweet's or write for complete data.

Controlled Companies of

American District Telegraph Company

155 Sixth Avenue, New York, N. Y.
Even Rear Pews can enjoy the service when the church is cork-quieted

The notes of the organ fade—a moment's pause—then the clergyman begins his sermon. Must his congregation crane forward, noticeably straining to catch every word? In the church that has modern acoustical treatment this tension is never necessary. Words and music are heard clearly, without distortion, in the auditorium where Armstrong's Corkoustic is used. The firm, strong cork panels, applied direct to ceiling and walls, muffle echoes and reverberations and quiet the disturbances of conflicting sound waves.

Corkoustic has another quality that is valuable in churches—and in any building where sound quieting or acoustical treatment is essential. It possesses high insulating efficiency, and so effects considerable savings in heating cost. Furthermore, its use materially shortens the time required to heat the building and helps to maintain more comfortable temperatures, both winter and summer.

Decoration, too, is simplified with the help of Armstrong's Corkoustic. Where a conservative effect is correct, the rich, natural cork surface in blended browns is just right. But if life and color are needed, then spray coats of cold-water paint in stencilled design over the cork aid the decorator.

He's a six-footer... "Measured which way?"

Can figures be facts if arrived at wrongly?

In considering performance of heating systems, no analysis or comparison based on hasty acceptance of inaccurate measurements or of incomplete facts, can be safe, or useful unless all the factors which may influence the result have been checked. For example, "lbs. per sq. ft. per season" may mean just as little as "twice as long as a piece of string."

Altogether there are 45 of these variable factors,—each of which may affect the requirements and results for better or worse. To allow any one of them to be forgotten or disregarded may lead to faulty conclusions. Engineers, architects and heating contractors will find the related subjects of heating steam consumption analysis, estimating and heating cost accounting, as presented by Warren Webster & Company, of vital interest. A request for further details will bring a Webster steam heating specialist to discuss this vitally important subject.

A Heating System for Every Need and Every Purpose

Heating requirements vary so widely that no one type of heating system can be expected to provide the greatest return on the dollar invested in the heating equipment for all types and sizes of buildings. Realizing this, Warren Webster & Company have consistently developed an entire group of Webster Systems of steam heating to provide a heating system for every need and every purpose.

Webster MODERATOR System provides "Controlled by the Weather" heating and makes possible new methods of operation and new standards of economy. Can be applied to any existing steam heating system of sufficient size.

IMPROVED Webster Vacuum System provides distribution balanced from the start—the supply of steam to each radiator is so equalized that all radiators get steam at the same time and in substantially the same proportion, regardless of distance from the boiler. May be supplemented by HYLO Vacuum Variator, permitting manual control by building operator. Applicable to new or existing installations.

IMPROVED Type "R" System for residences and larger buildings as well, combines advantages of steam heating with advantages of hot water, but without limitations. Meets fully the operating requirements of newer fuels, newer types of radiation and newer thermostatic controls. Also provides better-than-ever heating service with old radiation and old controls. Full details of any or all of these systems will be furnished on request.

Warren Webster & Company, Camden, N.J.

Pioneers of the Vacuum System of Steam Heating Branches in 60 Principal U. S. Cities Darling Bros., Ltd., Montreal, Canada

This is one of a series of advertisements discussing the factors affecting heating steam consumption. The purpose of the series is to call attention to the methods of heating steam consumption analysis, estimate and heating cost accounting developed by Warren Webster & Company to provide a reliable basis for comparing heating system efficiency. Actual detailed facts and figures of steam consumption of a number of Webster Systems of Steam Heating, prepared in accordance with these methods, are available for your examination.
TEST LOADS
tell the story of
The RAYMOND METHOD

No settlement—or settlement so slight as to be well within all calculations of load-support—this is the invariable story told by tests where concrete piles are poured into tapering, spirally reinforced steel shells and each shell left in the ground. These shells serve among other things to preserve the pressure created by driving—hence the load carrying capacity of Raymond Concrete Piles.

"A Form for Every Pile—
A Pile for Every Purpose"

RAYMOND CONCRETE PILE CO.
NEW YORK: 140 Cedar St.
CHICAGO: 111 West Monroe St.
Raymond Concrete Pile Co., Ltd., Montreal, Canada
Branch Offices in Principal Cities
A permanent, fireproof, no-maintenance base for ornamental roof covering—concrete that takes nails and holds them as firmly as wood!

Precast indoors under ideal conditions, reinforced and structurally strong, these slabs go directly on the steel roof purlins in any weather, and may be covered whenever convenient with slate, tile, copper or other surface.

There are no wood strips to rot out—the concrete does not disintegrate and loosen its grip on the nails—the ornamental roof remains in place and retains its original appearance.

**Featherweight Nailing CONCRETE ROOF SLABS**

(with insulating value)

are of Haydite—known for its trapped air cells which result in light weight and insulating value. They have been in successful service over a period of years on many prominent buildings such as:

- University of Chicago—Chapel, Eckhart Hall, Oriental Building.
- DeVilbiss High School, Toledo.
- Jackson County, Michigan, Sanitarium.
- Minneapolis Water Works, Fridley Filtration Plant.
- Shedd Aquarium, Chicago.
- Soulard Market, St. Louis.
- Parker Junior High School, Chicago.
- Cranbrook School, Bloomfield Hills, Michigan.
- Illinois State Women’s Reformatory, Dwight, 8 Cottages.
- Illinois State Women’s Reformatory, Dwight — Administration and other buildings.
- Lake Forest, Ill., Library.
- Harrison School, Cedar Rapids, Ia.
- Lane Technical High School, Chicago.
- Northwest School, Joliet, Ill.
- Fosh School, Detroit.
- Presbyterian Theological Seminary, Chicago.
- Sheboygan, Wis., Water Works.
- Roger Sullivan High School, Chicago.
- Groose Pointe, Mich., Pumping Station.
- Mundelein College, Chicago.
- National Kindergarten College, Wilmette, Ill.
- Meadville Theological Seminary, Chicago.
- Baltimore & Ohio R. R. Water Plant, Heath, Ohio.
- Elgin, Ill., Water Works.
- Meadville, Penn., Water Works.
- St. Louis, Mo., Water Works.
- Providence, R. I., Water Works.
- Chicago.

New folder, “Catalog and Roof Standards” on request.

Made, Laid and Guaranteed by

**FEDERAL-AMERICAN CEMENT TILE CO.**

Executive Offices: 608 South Dearborn Street - Chicago

Plants Near CHICAGO - NEW YORK - PITTSBURGH - BIRMINGHAM

FOR OVER A QUARTER CENTURY
Be Hard-boiled about Window Shades

Don't be easy-going when you buy window shades. Be hard-boiled about it. You'll save money that way, for all window shades are not alike. There is one to suit your needs at a lower cost per year than any other.

Go after that one. Make the man who claims he has it prove it. If he is showing Columbia shades, he has the proofs and likes to show them.

Real merit in a window shade goes deep. It's in the cloth; tucked away in the heart of the roller. The real savings you can make are tomorrow's, not today's—troublefree service; negligible upkeep.

Get these merits and savings. Look for them in Columbia shades. Be savage about it. See why the shading is better... in its raw materials and its expert making. Pull a Columbia roller apart. Know why it is noiseless, rustless, lastingly efficient. See for yourself its overpowered spring. Ask what buildings Columbia shades have proved themselves in... ask how well and at what cost.

Columbia makes the finest window shades. We welcome the hard-boiled buyer...he will learn how fine they really are!

Columbia

WINDOW SHADES

Rollers • Venetian Blinds

Type "R" STEEL BOILER for Smaller Buildings

COMPARE the new Kewanee Steel Boiler with any other small heating boiler made, and it is quickly seen that the buyer certainly gets more by investing in Kewanee. The sectional view shows some of the unusual Kewanee features. Ask for Catalog Number 88.

- CLEANSOUT DOORS—Both front and rear cleanout doors lined with high grade lead to prevent scum material to keep the heat inside the boiler.
- SHELL—All in one piece of thickest and heaviest steel plate. Flawless quality, giving great strength, unusual reliability and long life.
- WATER CONTEST—Large, continuous rapid. Water line in gauge glass steady. Generous steam space prevents water geeing up into main.
- REGULATOR—Automatic control back of boiler instead of in front. A single red operation draft door in base and check in cast iron two-way smoke hood which has damper also.
- DOUBLE PASS TUBES—Accessible from either end. Long gas travel and ample capacity to stem all of the heat from gases.
- CASTINGS—Quality patterns, smooth and substantial to withstand rough usage.
- GROUND SURFACE—Doors are surface ground, flanged tight to frame and shell.
- FIREDoor—Protected by buffer plate. Direction of flame travel keeps heat out of basement and away from the person when firing.
- UNIFORM BATING—Large overloads easily handled with long firing periods and low stack temperature.
- HIGH EFFICIENCY—Much greater economy than the average for low pressure heating boilers.
- KEWANEE GUARANTEE—Backed by 60 years’ experience in boiler building.

Tapped for Excello Water Heater

KEWANEE BOILER CORPORATION
division of American Radiator & Standard Sanitary Corporation
Branches in Principal Cities
KEWANEE, ILLINOIS
Member of Steel Heating Boiler Institute
You Can Rout the Ghostly Legions With Your Plans and Specifications

Of all weapons that can be used against the hideous legions, that wait to attack faulty or poorly designed plumbing installations, there is none so sure, so deadly as exact plans and specifications.

When these specifications call for plumbing and fixtures designed to meet and defeat the particular hazards of the job, the careless operation and heavy wear that will be encountered—the battle for sanitation at low through-the-year costs is more than half won.

To get such plumbing into specifications is neither difficult nor costly. The Clow Soldier of Sanitation stands ready at all times to help you select the proper fixtures, to work out the most economical layouts. At his finger tips is the accrued knowledge of Clow's 52 years of specialized plumbing experience.

At his back is the most complete line of specialized plumbing fixtures in the world, developed to meet particular needs in schools, hospitals, industrial plants, public buildings and similar installations as well as the smallest bungalow.

When you specify such fixtures, your plans and specifications become a sword that ghostly enemies cannot withstand.

CHICAGO
PREFERRED FOR EXACTING PLUMBING SINCE 1878
Consult your architect
The Modern Trend in MONUMENTAL ARCHITECTURE

Modern in design, beautifully finished and supplied with fine hardware appointments, Fenestra Steel Windows have won the approval of architects for use in monumental buildings.

Fenestra Windows offer finger-touch operation — they do not warp, stick or rattle. They admit more daylight. They provide natural ventilation without direct drafts; close tight without weather-strips. They may be washed on both sides from the inside, by low-cost labor. They add fire safety. Equipped with bronze-mesh screens when desired.

Sweet’s Catalog covers all Fenestra details and specifications. Literature or demonstration without obligation. Phone the local Fenestra office.

DETROIT STEEL PRODUCTS COMPANY
2286 East Grand Boulevard
Detroit, Michigan

Fen STEEL
MADE BY AMERICA’S OLDEST AND LARGEST
This outstanding example of modern architecture, housing two department stores, a hotel, an office building, a garage and a host of shops, has 58 separate roof surfaces, each protected by a Carey Built-up Roof.

Carey Roofs are selected for important structures because they possess definite advantages. Built of perfect bonding Carey felts and asphalts, every application step is controlled by rigid specifications. Carey Approved Roof Contractors perform the work, and the finished roof is bonded for 10 or 20 years, according to the type roof selected.

The Carey Specification Book, containing complete data on built-up roofs for all styles of construction, will be mailed on request.

THE PHILIP CAREY COMPANY
Lockland, CINCINNATI, OHIO
PENCIL POINTS FOR JANUARY, 1931

USG sound control engineers are able to analyze noise conditions scientifically and pre-determine accurately the success of corrective measures. Their services are available to architects who wish competent advice and counsel in solving their acoustical problems.

How Architects Use This USG Service When Sound Control Is Essential

A Message to Architects from The United States Gypsum Company

Architects who are called upon to specify materials and methods for controlling sound—by either insulating it or absorbing it—have found the services of a USG sound control engineer especially helpful.

Whenever you have a commission which calls for acoustical treatment, a USG engineer will gladly analyze the problem and give you a dependable solution. If desired, he will assist you to prepare the specifications. This counsel and advice on sound control will be thoroughly competent and his recommendations on materials and methods wholly dependable.

The United States Gypsum Company supplies not one, but many types of materials and constructions for use in controlling sound. For absorbing noise, Acoustone, the USG acoustical tile, has been used with good success in both new and existing buildings. It is easily and quickly applied over present walls or ceilings without interruption to business or other activities.

Where installed, Acoustone creates a comfortable noise level. A wide selection of beautiful designs and shapes in varied colors is available. These colors and designs harmonize with all styles of architecture and add to the decorative attractiveness of any surroundings.

Made of mineral fibre, Acoustone is fireproof and, when soiled, may be easily cleaned.

You are invited to call in a USG engineer to help you with any problem in sound control.

Of course, there will be no obligation for this service. Please address the United States Gypsum Company, Dept. 281, 300 West Adams Street, Chicago, Illinois.

ACOUSTONE
ONE LEAKY PIPE

could ruin this beautiful home!

IN THIS business age of specialization, competent counsel and scientific information are essential. This is why A. M. Byers Company, in presenting the message of Byers Genuine Wrought-Iron Pipe to the general public, stresses the importance of following the recommendations of recognized architects and builders.

Leading architects and builders know that in any “pipe prescription” Byers Genuine Wrought-Iron Pipe is a basic feature. As an architect or builder, you know the places where actual service has demonstrated the superiority of Byers Genuine Wrought-Iron Pipe. You know also the error of substituting unsuitable materials in these places. A statement we make to the public is this: When specified and installed by building-specialists for definite purposes, Byers Genuine Wrought-Iron Pipe is the utmost in service and durability — and present and future economy!

Important: We want you to use Byers Genuine Wrought-Iron Pipe in those services for which it is best suited. In every home there are specific places for Byers Pipe. We accept as a business responsibility preservation of its traditional superiority in its proved field of service. Whatever your pipe problem, we will be delighted to place the facilities of our organization at your disposal in helping to solve them. Look for the Spiral Stripe! Write to us.


BYERS GENUINE WROUGHT-IRON PIPE

AN INVESTMENT — NOT AN OUTLAY
This year it takes 22 pages in Sweet's Architectural Catalog to tell the complete story of WEIS products. These 22 pages contain a great deal of new and highly important information. WEISALLOY, a new material, is introduced and explained; there is complete information about flush WEISTEEL; a large number of detail drawings will assist you in your work. Turn now to page B-2921, Sweet's for 1931, and examine this wealth of information. Or, if you wish, we'll be glad to send you a copy of our catalog, printed separately.
The Whitest Glass made for Windows

CLEARER, flatter, more lustrous... truly a remarkable product. LUSTRA GLASS transmits a substantial amount of the shorter ultra-violet rays of sunlight of a wave length of 313 mu. ... It costs no more than ordinary window glass and is the whitest of all glass made for windows as evidenced by the unretouched photo shown at the left.

This is an "edge on" view of four stock samples of the leading and best known makes of glass ... The second from the left (the white one) is LUSTRA GLASS ... you can make this test yourself... The superiority of LUSTRA GLASS is obvious ... Its marked freedom from color alone is sufficient reason for its use in better buildings.

*Send for LUSTRA GLASS BOOKLET A-620 and SPECIFICATION SHEET and see complete table of transmission. Write today.

AMERICAN WINDOW GLASS CO.

Farmers Bank Bldg. Pittsburgh Pennsylvania

Also Makers of Armour-Lite Scatter-Proof and Bullet-Proof Glass, Tintaglass, Picture Glass, Photographic Dry Plate Glass, 1/8" and 3/16" Crystal Sheet, Ground and Chipped Glass, Improved Quartz-Lite and Bulb Edge Glass.
UNLESS the bricklayer is given good, rich, mortar, he cannot do quick, neat, economical brickwork. One part Brixment, three parts sand, makes a mortar plastic like a straight lime mix and strong as the brick itself.

It is unusually easy to spread, and when the bricklayer throws up a head-joint, the mortar sticks to the brick. Louisville Cement Company, Incorporated, Louisville, Kentucky.

CEMENT MANUFACTURERS SINCE 1830
Mills: Brixment, N. Y. and Speed, Indiana

BRIXMENT
for MASONRY and STUCCO
IN CLEVELAND'S FAMOUS
"HOME in the SKY"

STEEL EQUIPMENT INSURES BEAUTY, CLEANLINESS, PERMANENCE

HIGH up on the sixteenth, seventeenth and eighteenth floors of the Builders Exchange Building in Cleveland there has been built a home that is the last word in modern beauty, comfort and cleanliness; that is an inspiration to all prospective home owners. A home that emancipates its owners from the drudgery of housework.

Significant of the place steel has taken in the present day home is the fact that everywhere possible in this model home, steel equipment was installed.

Of particular interest to housewives is the kitchen with its easily cleaned, enameled steel wall tile, steel incinerator, porcelain enameled steel range and refrigerator and in the basement is found the porcelain enameled washing machine, enameled steel mangle, colorful steel water heater, clothes dryer and steel vegetable bins.

Architects and builders who have an eye to the sales value of their homes can well afford to get all the facts about steel household equipment. Complete information on such products—from the basement to the roof—will be supplied on request. Trade Research Division, National Association of Flat Rolled Steel Manufacturers, 511 Terminal Tower Building, Cleveland, Ohio.

SAVE with Steel

Household Equipment
AR-KE-TEX Tile Colors Give Designer Wide Scope

- At right and left are shown suggested pilaster treatments in which standard units, standard colors and textures are used. By means of combinations of different standard units and various colors, a practically unlimited number of original architectural effects for wall surfaces can be produced. Such effects are not only strikingly beautiful, but can be obtained at a cost less than that of any other material by which similar effects can be created in permanent, sanitary wall finishes.

The effect in the treatment shown was obtained by the use of standard units of a high gloss Black, a glossy Amber Tan, and a Cream Tinted White. Samples of these new colors and of many other new shades and textures will gladly be shown to any architect by our nearest representative.

Beauty That Is Permanent
Walls That Are Enduring

The beauty of wall designs worked out in AR-KE-TEX Tile is no fleeting thing, but permanent and imperishable. The colors and textures are everlasting because they are impervious to the action of acids, alkalis, moisture or any of the elements which cause the deterioration of walls of less enduring material.

AR-KE-TEX Tile is hard burned. That is why it builds a sanitary wall, which cannot be permanently despoiled by any ordinary means, and which never requires painting or refinishing.

An architect who creates beautiful wall effects through the medium of AR-KE-TEX Tile has the assurance that his work will remain a credit to him as long as the building stands.

For detailed information see our catalog in Sweet's 1931 Architectural Edition.
This, Sir, is the day of change.

Architectural forms and architectural materials that were good enough twenty years ago, are not always adequate now.

Yesterday's champion may trail the pack today. And be forgotten tomorrow.

Into this age of constant searching for new and better materials, the new series genuine Type "B" Von Duprin device brings a wholly new conception of exit service. Modern in line, stronger, more reliable than any devices known a few short months ago, these new Von Duprins are finding their rightful place on the doors of the noblest structures of today.

VONNEGUT HARDWARE CO.
Indianapolis, Ind.

Listed as Standard by Underwriters' Laboratories
THE Seymour H. Knox residence at Aiken, S. C., is one of many luxurious homes throughout the United States where the ornamental metal fittings have been executed by FISKE. The preference for FISKE is constantly growing among architects and especially among architects whose specifications always call for the finest. For they realize that to specify "metal work by FISKE" is to specify the finest in workmanship, materials and perhaps what is even more important—over 70 years of experience in close cooperation with architects and builders.

The FISKE organization maintains complete consultory and design services which are always available to architects interested in ornamental metal work. Write for illustrated catalogue.

J.W.Fiske IRON WORKS  
80 Park Place ~ New York  
ESTABLISHED 1858  
SPECIALISTS IN ORNAMENTAL METAL WORK
TERRA COTTA

Because it is easily modelled, an extensive use of terra cotta is always extremely practical even for industrial buildings.

The photograph shows one of a series of panels symbolizing Invention, Education, Progress, etc. At small cost, the Bendix Building is thus set apart from its neighbors and given individuality.

NATIONAL TERRA COTTA SOCIETY

230 PARK AVENUE
NEW YORK

NATIONAL TERRA COTTA SOCIETY
Please send me your plates
TERRACOTTA — STANDARD CONSTRUCTION

Name
Address
City State

FOR BEAUTY OF TEXTURE

MOUNT AIRY GRANITE

Write for samples and photographs
J. D. SARGENT GRANITE CO.
MOUNT AIRY, N. C.

LEONARD
Thermostatic
Water Mixing Valves

TYPE L-9 OCTAGON DESIGN
Catalog C of Leonard Valves, showing Type L-9 Octagon Design and Colors to match bathroom fixtures, is now ready.

Write for your copy
LEONARD-ROOKE COMPANY
Elmwood Station, Providence, R. I.
THE 115th WISH

Our first “A Happy New Year to You!” greeted your professional predecessors in 1816. Here, as this newest New Year begins, we repeat what we have said on many similar yesterdays—We believe we can serve you better.

LAWCO
Bathroom Cabinets
(and Access Units)

are qualified to be called superior. An unusually diversified range of styles and modern models for home, office, and hotel, at attractive prices. Universally stocked by local dealers.

We’re on Pages D-5060 and D-4963 in your 1931 Sweet’s

The F. H. Lawson Company
CINCINNATI, OHIO
Makers of Good Products since 1816

SPOTS
of LIGHT
and COLOR ....

A most effective method for the proper display-window presentation of merchandise is through the use of Mobile Lighting, either white or in color.
• Mobile White Lighting is used to “spot” a succession of displays, Mobile Color Lighting to form an appropriate background of changing color. Both methods are discussed in Bulletins which will be sent to you at your request.

WARD LEONARD ELECTRIC CO
MOUNT VERNON, N Y

Ward Leonard manufactures Virohm Dimmers for all lighting control needs; motor starters and controllers, resistors, thermostats, and a variety of other electric control devices.
PENCIL POINTS FOR JANUARY, 1931

Type B Acousti-Celotex square cut, with unbeveled edges (Number 725), was used in St. Joseph’s Episcopal Church, Detroit, Michigan. Nettleton & Weaver, Architects.

Freedom of design with Acousti-Celotex

This is an example of how Acousti-Celotex sound absorbing tile was incorporated in the design of St. Joseph’s Episcopal Church, Detroit, Michigan. Nettleton & Weaver, Architects.

With Acousti-Celotex, the decorator is allowed free rein because this sound-absorbing material can be painted with any kind of paint without loss of acoustical efficiency.


Acousti-Celotex comes in three types, C, B, and BB, with coefficients of .30, .47 and .70. The deep perforations permit repeated painting with any kind of paint. Send for descriptive booklet.

The words Celotex and Acousti-Celotex (Reg. U. S. Pat. Off.) are the trademarks of and indicate manufacture by The Celotex Company.
A NEW NAME
for a widely established product

Nevastain is the new name given to the Nirosta and Stainless Steels produced by Ludlum Steel Company, Sharon Steel Hoop Company, and Timken Steel & Tube Company.

The combination of these three outstanding steel sources, together with their banded staffs of authoritative engineers and metallurgists, places at the disposal of users of these alloys a new and most comprehensive service.

The entire resources, research findings, fabrication experience, installation knowledge and experimental laboratories, of these three companies in connection with all the standard grades of corrosion, heat and wear resisting alloys including Nevastain KA2 are now available to the industrial plants of America.

Nevastain steels are furnished by Associated Alloy Steel Company for every fabricating requirement—bars, sheets, hot and cold rolled strip, tubing, wire, welding rods, billets, slabs, plates, castings, etc.

ASSOCIATED ALLOY STEEL CO., INC.
General Office — 1806 Union Trust Building
CLEVELAND, OHIO

Branch Offices
NEW YORK
PHILADELPHIA
NEW HAVEN, CONN.

CHICAGO
DETROIT
CINCINNATI
LOS ANGELES
SAN FRANCISCO
THE DOORWAY OF AMERICA'S FREIGHT ELEVATOR TRAFFIC

dynamo... modern descendant of primitive tread mills... impetus that animates into being the products of industry. But these products must move—from machine to machine—floor to floor—from maker to buyer. Peelle Doors accelerate the flow of products that power produces, help quicken their vertical voyage throughout the plant. Motorized... they afford automatic entrance and exit at the touch of an electric button... level vertical shaftways into horizontal highways... clear the right-of-way for interior traffic. Peelle Doors guard men and freight against accident, save time and labor—function with speed so that production energy may not waste itself in slow motion. In these things Peelle Doors justify a slightly higher first-cost, which low-upkeep and trouble-free service makes negligible through the years. A Peelle catalog will be gladly sent upon request, or consult our engineers.

THE PEELLE COMPANY, BROOKLYN, NEW YORK
Boston, Chicago, Cleveland, Philadelphia, Atlanta and 30 other cities
In Canada: Toronto and Hamilton, Ontario
WHERE the world achieves its standards of sanitation, the drain manufacturer is called upon for the utmost in engineering skill. Unusual requirements that guard against contamination to a degree seldom appreciated by the layman are a hard and fast rule of medical institutions. These needs become amplified when applied to the one location in each instance that must carry away hospital drainage. The refuse in waste water would quickly damage a plumbing system and this dual duty of drain and interception offers unlimited solutions for the drain manufacturer.

All drains and interceptors installed throughout the two St. Louis hospitals shown above are Josam. From the list below it will be noted that every type of drain and interceptor is included in the Josam line. Catalog G shows this complete line and offers many practical suggestions.

**Josam Manufacturing Company**

4908 Euclid Building  
Cleveland, Ohio

FACTORY: MICHIGAN CITY, INDIANA

BRANCHES IN ALL PRINCIPAL CITIES

Catalog G shows the complete Josam line: Josam Drains for Floors, Roofs, Showers, Urinals, Garages and Hospitals; Josam Swimming Pool Equipment; Josam-Marsh Grease, Plaster, Dental and Surgical, Sediment and Hair Interceptors; Josam-Graver Floor-Fed, Gas-Piped Garbage and Rubbish Disposers; Josam Open Seat Back Water Seater Valves; Josam Open Seat Swing Check Valves; Josam Adjustable Closet Outlet Connections and Bends, Water and Gas-Tight.

**Josam Products are Sold by All Plumbing & Heating Supply Jobbers**

There are no substitutes for Josam products.
Orange Aluminum Screens

Flat Screens For Pivoted Sash

It is not enough that Orange Aluminum Screens are made from bars of metal, welded at the corners, strong, enduring and beautifully finished.

They are designed to do away with many of the unsightly makeshifts that you have had to put up with in even the best of other screens. Screens for side pivoted sash are an apt instance. Instead of the old semicylindrical screens so often used, Orange Aluminum Screens are made in two flat sections, with a contact roll at the pivoting line, that allows the sash to swing wide open yet remain insect proof at any angle.

The reduced drawing below is taken from one of twenty plates in our A. I. A. Catalog, showing correct screen installations for windows of every type. If this catalog is not in your files, write for it.
Hospital Sterilizers
Consultation and engineering service on sterilizer installations

Selection of Sizes
Method of Heat
Roughing-In
Sanitation
Specifications

CASTLE
World's Largest Line of Sterilizers

Wilmot Castle Co., 1226 University Ave., Rochester, N. Y.

Another Fine Hospital Noise Protected

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Elevator Entrances by DAHLSTROM

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Catalog in Specification Data, 1930 Ed., pp.230-31

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A brand-new series of related fixtures and fittings—modern, beautiful, designed to harmonize especially with each other. Original with Kohler!

If you've had your eye on plumbing trends, you've watched the demand for matched fixtures gather speed. Bathrooms, important as they are, have been getting brighter, more important all the time. And lately, home-hunters and home-owners, keen about the decorative effect, have been asking for lavatories, baths, and closets that go together.

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The first of the new sets is illustrated—an exclusive Kohler design. You have a choice of sizes and models. Octachrome fittings are new, too—made of the finest brass, they do their work surely, silently, positively... All-Kohler plumbing is a lifetime investment in comfort. Complete Kohler bathrooms with matched fixtures, a great step forward, promise unfailing beauty and satisfaction.

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See Our Complete Catalog in Sweet's 1931 Edition—Pages A777-A842
How Prominent Architects have used Alcoa Aluminum in 48 Important Buildings


Aluminum castings used in these buildings were made from Alcoa Aluminum Alloy No. 43

They commanded a metal that lent itself readily to architectural design and fine detail.

13 CREIGHTON UNIVERSITY, Omaha, Nebraska. Architect: Leo A. Daily, Omaha. General Contractor: A. Berchman and Son, Omaha. Sub-contractor on aluminum work: Kraus and Trustin, Omaha. ALCOA ALUMINUM used for spandrels.

14 MILWAUKEE COUNTY COURT HOUSE, Milwaukee, Wisconsin. Architect: Albert Randolph Ross, Milwaukee. General Contractor: A. Burchman and Son, Omaha. Sub-contractor on aluminum work: Kraus and Trustin, Omaha. ALCOA ALUMINUM used for spandrels.


Aluminum castings used in these buildings were made from Alcoa Aluminum Alloy No. 43

Page 3

They secured permanence—saved handling unnecessary weight—cut cost of erection

25 FAIDLEY BUILDING, Omaha, Nebraska. Architect: McDonald and McDonald, Omaha. General Contractor: A. H. Brodkey Company, Omaha. Sub-contractor on aluminum work: Kraus and Travis, Omaha. ALCOA ALUMINUM used for spandrels, store fronts, mullions.

26 PARK PLAZA HOTEL, St. Louis, Missouri. Architect: Bauman and Schopp, St. Louis. General Contractor: A. H. Brodkey Company, Omaha. Sub-contractor on aluminum work: Kraus and Trustin, Omaha. ALCOA ALUMINUM used for spandrels, storefronts, mullions.


32 SEVERANCE HALL, Cleveland, Ohio. Architect: Walker and Weeks, Cleveland. General Contractor: Crowell and Little Construction Company, Cleveland. Sub-contractors on aluminum work: Industrial Asbestos Company, Cleveland; The John Hansen Bronze and Foundry Company, Cleveland, ALCOA ALUMINUM used for roof, doors, marquise, stair case, terrazzo strips, grilles, panels, etc.


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A Bulletin from the A. I. A.

Graduates of the foremost schools of architecture here and abroad have been thrust into the ranks of the unemployed. In the region of New York it is estimated that there are 3,000 architects and 12,000 architectural draftsmen. Investigation indicates that at least ten per cent. of this number are in need. Among them are former university teachers, practicing architects, and men who have won prizes and medals for outstanding achievement in their profession.

Nearly 500 have registered at the Bureau set up by the Architects’ Emergency Employment Committee at the Architectural League Building, 115 East 40th Street, with Julian C. Levi, fellow of the American Institute of Architects, as chairman, and Harvey W. Corbett, Chairman of the Architectural Commission of the Chicago World’s Fair of 1933, as treasurer.

The New York and Brooklyn Chapters in the American Institute of Architects, and the architectural societies of Westchester, Long Island, and New Jersey, as well as kindred organizations, are cooperating in the work of finding jobs. Thirty or more new applicants register daily at the Bureau, which is in charge of Mrs. Lyda M. Nelson.

Many of the registrants evidence urgent need. Skilled men who have earned more than $5,000 a year are now lucky if they can earn the emergency stipend of $15 a week, it is said. One man “would drive a truck.” Another “would gladly do anything however menial.” More than three-quarters of the idle draftsmen have from one to three persons dependent upon them for support. Their ages range from 24 to 60, and their experiences from 2 to 41 years.

Among them are men who have received degrees from New York University, the College of the City of New York, Columbia University, the Yale School of Fine Arts, the Beaux Arts Institute, the Ecole des Beaux Arts, Cornell University, Massachusetts Institute of Technology, and the Universities of Pennsylvania, Wisconsin, Illinois and Michigan.

The majority have served long apprenticeships in offices of leading architects in New York, London, and the ateliers of Paris. They include men who have worked on buildings such as Washington Cathedral, where Admiral Dewey and President Wilson are buried, and the Stanford University buildings.

The Architects’ Committee, in collaboration with the Emergency Work Bureau of the Emergency Employment Committee headed by Seward Prosser, has so far been able to give employment to only fourteen of the most needy draftsmen on the basis of $5 a day for a three-day week.

One of the first draftsmen to work at the emergency rate of $15 a week is a University of Pennsylvania graduate with a wife and two boys to support. In addition to his university training he has studied in Europe and has fine New York references. He has earned $100 a week, but as he has been out of work for a year, his resources are exhausted, and his plight is desperate.

Another draftman who has joined the long line which forms at four o’clock in the morning outside the headquarters of the Emergency Work Bureau at 40 Wall Street is a man with a wife and three children to support. His earnings have been $80 a week. Despite his eleven years’ experience and the beautiful drawings he has to show, the rent has been paid only through December 15, and there is no hope of adequate earnings to meet expenses.

These two draftsmen are typical of the fourteen men with wives and two or three dependent children who are considered fit candidates for relief.

However, the Emergency Work Bureau has not the facilities to take care of such cases as that of the Columbia University graduate who also studied at the Beaux Arts Institute of Design, and now has a wife and mother to support. He has been out of a job for the last six months.

He is 34 years old, has previously been employed for eight years as chief designer with three of the foremost architects’ firms in New York, and his work has often illustrated one of the leading architectural magazines. He now seeks work on a part or full time basis as architect’s renderer.

The case of the Cornell man who is a bachelor, 42 years old, with 17 years’ experience and first-rate references, who has been out of work for the last eight months and ‘will accept any employment,’ having just recovered from two months’ illness, also falls outside the province of the Emergency Work Committee.

The 24-year-old man who recently completed the five-year course in mural decoration at the Yale School of Fine Arts, whose father is now out of work, whose brother and sister are too young to work, and who had earned $40 a week toward their support, is another instance of the calibre of the draftsmen seeking work.

One of the applicants now in urgent financial need has been awarded the medal of the American Institute of Architects for distinguished work. One, with a dependent wife, has been out of work for the past four months.

Another man now eager to find employment as an able architectural draftsman is a former member of the American Institute of Architects and of the Beaux Arts Society. He has had forty-one years’ experience and has done brilliant work in New York, Chicago and South America. He is now about 60 years old, and has a wife dependent upon him for support.

Reasons for unemployment are various. Many are traceable to the slowing up and cessation of building projects, and the complete shutdown of architectural departments in banks, and other institutions.

In response to the appeal of the Architects’ Emergency Committee, only four organizations requiring the services of architectural draftsmen have so far notified the Committee of positions that may be open.
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TOLEDO IN CANADA TORONTO, ONTARIO
Let's Make It a Happy New Year

As we go into 1931 we sincerely wish every one of our readers increasing happiness and prosperity for the coming year. At the present moment, things probably look pretty dark to many architects and draftsmen. Lack of work and the accompanying lack of income which has been the lot of hundreds of men in the profession in recent months make it hard and almost impossible for them to be cheerful. Yet that hope which springs eternal in the human breast bids us all to carry on with confidence that better times are coming. Buildings have got to be built in the future as in the past and there must be architects and draftsmen to design and detail them.

A bulletin circulated in New York by the American Institute of Architects paints a truly discouraging picture of present conditions. It is estimated that in the region of New York there are 3,000 architects and 12,000 draftsmen. The report states that at least ten per cent of this number are unemployed and in need. The Architects’ Emergency Committee is doing its best to cope with the problem of finding work for these men where no work exists, but the response to its appeal has so far been slow. On the preceding page we have printed the A.I.A. bulletin in full, hoping that it may reach the eyes of some architects who have been successful in getting new jobs and who may be in immediate need of men. To any such the proper course will be obvious.

Those who are not now in a position to take on more work may, we hope, work just a little harder to persuade their lagging prospects that now is the time to build. The truth will be back of their arguments and lend them strength. Every man in the profession can do his bit to start things going if he will seize every opportunity to point out to the layman the advantages of investing money in buildings at the present time.

In our last issue we stressed this point but it is worth keeping at it until things get under way. Materials can be bought cheaper and labor is more efficient than when everything is rushed. The architect and his men can study their jobs more carefully which will be to the advantage of the owner. There are many valid arguments all pointing in the same direction.

Of course, business might not be so good for order takers now, but there really seems to be plenty for real salesmen. Constructive, intelligent sales efforts are as productive now as ever and the results stand out more clearly amidst the dimness of this well advertised depression. Plenty of elbow grease plus straight thinking will make 1931 as sound and prosperous as anyone could wish.

Build your sales properly and people will build.
James B. Newman of the Firm of Ely Jacques Kahn describes

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PENCIL POINTS
January, 1931
PENCIL POINTS
Volume XII  January, 1931  Number 1

Apples!
By William Williams

A draftsman who can look death in the face and laugh might be amused at the architectural situation. Most of us can’t. A lot of us haven’t even got a situation to laugh at, certainly not in. It has been rumored that at least six members of the Architectural League are selling apples in the financial district. How they managed to get the apples has not been learnt, nor, as far as I can discover, do their colleagues care. As long as they muffle themselves up well, so as not to be recognized by past or future clients, that is all that the League, in these trying times, can expect.

At least a man selling apples has got a job, and that’s something. Moreover, there is still a chance for a good architectural man to distinguish himself, even on this humble plane. It was, indeed, in the extraordinary skill displayed by an apple vendor that attention was drawn to the fact that architectural men have been reduced to this ignominious role.

Here was a man the casual observer would not have taken for a draftsman at all. There was about him a sense of dignity not commonly found in architectural circles. But he was young, the rounding of his shoulders had barely begun. Blank honesty, the light of idealism and creative ambition still shone—faintly, it is true, but still shone—in his face; he had not yet learned to steal with the insouciance of his seniors. No one would take him for a Beaux Arts graduate, a Phi Beta Thingumajig, and all the other things he turned out to be. But there he was; and there were his apples, piled up on his box as only an architect could pile them.

I stood for a moment spellbound, fumbling for a nickel. “Well!” I said. “Well!” And that is all I could say. Here was genius, rotting, so to speak, in the gutter. Such mass! Such a feeling for balance, proportion! Such a study in set-backs! And then, as I found a nickel, my courage failed, a lump rose to my throat. I put the money back into my pocket and shook my head. “No,” I said, “I haven’t got the heart,” smiling at the bright young man in admiration.

“An apple, sir? A nice rosy Skookum?”
“No,” I said again, a certain amount of uncontrollable compassion in my voice, “I’d like to, but as I say—I haven’t got the heart.”

“It was plain that he didn’t understand, not realizing his genius. But I could see that one apple off the top of his pyramidal structure would have ruined it, would have been like taking the beautiful golden crown from the summit of the New York Central building. I couldn’t do it.

“I don’t want to spoil it, son,” I explained. “Your design—it’s perfect!”

“Ah, do you like it?” he said, recognizing at last the critic in me, the connoisseur, the fellow architect. “Do you like it?” He rubbed his hands with satisfaction as I nodded my approval.

“I’m glad you do,” he said, “there’s years of study behind all that.”

“I can see it,” I said.

“There is,” he added, looking wistfully at somebody’s chewing tobacco lying on the curb, “there is.”

And then he told his story: how he had graduated in architecture with honors, won a traveling scholarship, come back, taken his master’s degree; how he had been made honorary member of half a dozen societies; how he had been working on his first book, “The Relation of Design to Industry,” when the slump came. At this time he was chief designer for a small firm doing big work—or a big firm doing small work—I forget which. But it doesn’t matter—he was a designer and he had a job.

At this point he broke into a sob and I, so innocently stumbling upon all this misfortune, could hardly constrain my tears.

His office, he went on to tell me, closed three weeks after the stock market crash, owing to the wife of one of the members of the firm losing so much on the curb, or somewhere. Anyway, he lost his job and walked the streets ten days, when he managed to get another job that lasted two months. Then he walked the streets again, this time for two months before he got a job, which lasted only ten days.

That was four months ago, and now the unfortunate wretch is selling apples.

“But tell me,” I said, as I put my hanky back in my pocket, “how does a man of your creative genius manage to sustain himself—mentally, I mean? It must be awfully monotonous standing in one spot doing nothing, so to speak—awfully monotonous.”

He laughed in his throat. “No,” he said, “it’s not as bad as that. I manage to amuse myself. There’s always something to be seen on the sidewalks of New
York.” And I caught his eye following a plump little blonde. “Take, for instance, the other day. I saw an old blue-print runner hot-footing it along 42nd Street with two new drafting table drawers in his hands—and I couldn’t help but laugh—there were six or eight draftsmen trailing him to find out where he was going to deliver them. Things like that strike you as funny when you’ve been standing in the cold six or eight hours.”

He was grinning, so I grinned too. Though to tell the truth I was feeling far from it.

“It’s little things like that,” he continued, “that help to pass the time. And then, of course, there’s always the apples,” he was looking at his fruit, “there’s no end to what you can do with a box of apples. This design here,” he said, indicating the pyramidal effect, “is purely imaginative, just an attempt to superimpose one rhythm on another, a minor rhythm on a basic rhythm. Do you ever read Mr. Walker’s articles? Well, never mind, you get the idea. Sometimes I work it out in color. You’ve noticed that one side of nearly all these apples is green, haven’t you? It’s simple.

“But I don’t always do these sketches, as I call them, sometimes I try to do a building from memory, or one that I can see from here. Yesterday I tried to do the Chrysler, but I couldn’t get the effect without using matches, and that spoils the apples. There’s really no end to what you can do. And then there’s always the chance that somebody’ll come along just when the thing’s taking shape and pick out half a dozen from the bottom, and you’ve got to start all over again.”

I was stirred by the young man’s keen enthusiasm for his art even under the trying circumstances of adversity, and I asked him if he’d leave his apples for an hour and have lunch with me. But he couldn’t come, having to attend an alumni luncheon at the Fraternity Club.

“It’s too bad,” I said, by way of consolation, as I moved, about to leave him. “What are we going to do? We’re all more or less in the same boat, you know.”

“We ought to do something,” he murmured.

“Yes, we ought to do something,” I repeated, nodding my head, knowingly.

“Yes.”

“But what?” I asked.

He wiped his nose on his sleeve. “I don’t know,” he said, “I don’t know that we can do anything to relieve the situation. But we might take advantage of it.”

“Take advantage of it, how?”

“Well,” he replied, and there was a mischievous glint in his eye, “now that architects have nothing to do, we might take a minute or two off to look over what we have been doing in the past ten years. Now that there’s nothing to do I know a lot of chaps who could put in some valuable time practicing.

“Look at all this tripe,” and he waved his arms in the air, in a wide, embracing sweep of the Grand Central zone, “look at it all, every bit of it put up since 1920, and not a building worth a second look. Practice, that’s what the boys need, practice, they don’t know the fundamentals, don’t know the elements.”

He was obviously mad. I felt uneasy and edged away a bit. But he moved towards me. And taking me by the lapels of my coat, he stared into my face with a wild, frantic stare.

“It’s our education,” he breathed into my face. “Our education. The whole weakness of our architectural education. Architects should be trained to design in three dimensions, build up their masses with clay, work in the solid, always in the solid, do away with line drawings with their artificially rendered lights and shadows, do away with paper entirely until they’ve got the mass right, the relation of the parts—then start the mechanical business of drawing, committing the thing to paper. Work in the mass, always in the mass, get the parts right.”

I grinned, to conceal my embarrassment. The hard times had gone to his head. Underneath his genius, he was cracked. And with one more admiring glance at his handiwork, an imaginative building done in Skookums, I left him.

But all that afternoon as I walked around town, his words kept ringing in my ears—“There’s no end to what you can do with a box of apples.”
On the Making of Pictures and the Thumb-nail Sketch

By George Nelson

Sketches may be divided, generally speaking, into two classes. One type is made to record facts. It is a document. Made by an architect, it may show the arrangement of voussoirs in an arch, the profile of a moulding, the effect of a group of buildings. Such a sketch, made by a painter, might be concerned with different objects, but the end in view would be the same. These are usually made with the greatest rapidity and economy of effort consistent with whatever accuracy is desired. They may be, and often are, very beautiful bits of drawing, such as Brangwyn's pencil and sanguine studies for etchings, or Michelangelo's anatomical studies, or they may be all but unintelligible to anyone but the artist, like Roerich's pencil notes for his powerful Tibetan landscapes—but they are all the same in that all were made to record facts for future use.

The other type is a picture. Its only purpose in life is to create an impression on the beholder, when hung on a wall in an appropriate environment. It may be that it causes the observer to have a feeling of great pleasure in its harmony of line and color, but should the reaction be one of complete mystification, or even of actual disgust, as is often the case in these days of flourishing galleries of modern art, it still remains in the same category, because the artist is in no way limited to any particular sort of impression. In this type of sketch—which might be called decorative—should a modillion, or an entire cornice be omitted, or a thick grove of trees introduced where there was actually a bush and three tin cans, no one thinks the less of it except those unfortunate souls, reared on bargain basement oil paintings and picture post cards, whose sole artistic criterion is versimilitude.

In this classification, as in all others, there cannot be a definite line drawn. For example, a water color by Bonington or Walcot, an etching by Meryon or Rushbury or Rosenberg—any of these might be used to obtain information about their subjects, so accurately are they drawn. And conversely, many sketches made solely for the artist's information might be classed as works of art. Nevertheless this differentiation may well be adhered to, and, when applied to most architects' sketches, is peculiarly appropriate because it is a common misfortune of draftsmen and students that when they go out to make a picture, they return, more often than not, with a document. Now, while one cannot possibly have any quarrel with anything as praiseworthy as seeking after more knowledge, the fact remains that most of us have a very strong craving to make pictures when we go sketching—gorgeously free and bold water colors, lithographs with smashing blacks and intense whites, and so on. We want things we can show with pride, which we can give away (without the usual financial strain) on necessary occasions, and even hope, perhaps, to be so fortunate as to sell some one day to weak-minded, but opulent, would-be patrons of art. The point is, how to get that way? How can we throw off the influence of school and office, which makes us want to put in everything we see?

The fundamental difficulty, I think, lies in our con-
LITHOGRAPH BY GEORGE NELSON—"CHARTRES"

Size of original, 11 1/2" x 17"—see small pencil study on page 3. Note that it is reversed like drawing on stone from which this print was made.
The richest collections of patterns of light and dark anyone could want.

Unfortunately, pictorial composition is a most elaborate subject, and most of us haven't time enough to sketch, let alone read books about it. There are a number of things one can do, however. Magonigle suggests sketching objects with which one is unfamiliar, clouds, boats, trees, and other irregular forms. I have also heard two excellent water colorists sing the praises of still lifes as a means of loosening one up. The practice which I have had most experience with, and the one which seems to bring one about to the desired "painter's approach" with less effort, and more directness than any other is the thumb-nail sketch.

It is about the size of a postage stamp, to start with, and is done with a soft pencil. Under these circumstances it will be found rather difficult to be tight. And while one might go on doing trees, boats, and flower pots in the same old dry way, when one is confronted by a space an inch square and a soft pencil there is absolutely nothing to do but worry about the biggest, and only the biggest, elements in the composition. Also, under such conditions, "technique," the great bugbear of the novice in sketching, espe-
PENCIL POINTS FOR JANUARY, 1931

STUDIES FOR A PENCIL SKETCH OF ST. ÉTIENNE DU MONT, PARIS
EXAMPLES OF ARBITRARY PLACING OF VALUES

...cally pencil sketching, is reduced to its proper place.

I have found that a good procedure is to make two or three tiny sketches, locating the masses of black, gray, and white, and then to work at a somewhat larger scale, keeping the same breadth and simplicity of pattern, but introducing a bit more drawing, to make sure that I wasn’t fooling myself. These larger sketches not only simplify making the final one, but provide a tremendous incentive, because they are almost invariably better.

Make lots of thumb-nail sketches. They are easy and don’t take any time, and once that one becomes interested in making decorative patterns, the old feeling of reverence for the sacredness of subjects rapidly disappears. If a shadow spoils an otherwise good sketch, why not leave it out? No one will care. Should a tree, or a flight of steps be embarrassing, move them, or omit them. If your conscience bothers you, get a camera and take a good, accurate photograph of the scene—take several if it will make you feel any better—and then make the sketch as seems best. A good practice to indulge in occasionally, if one is particularly squeamish about omitting things, is to make one’s thumb-nail sketches, and then to turn one’s back to the subject and make the sketch from the little ones. This may mystify the onlookers, but it will result in an omission of a large part of the trimmings, and is likely to produce a considerably better sketch. From the thumb-nail sketch one can progress to numerous variations, working in line rather than value, in color, and in combinations. Make large sketches, using materials such as Conté, or litho sticks, or charcoal which force you to keep the broad simplicity of the miniatures. And keep away, for a time, from anything resembling a careful drawing. If you have a choice between making one careful sketch, and four rapid ones, do the four and buy a picture postcard of the first.

Try sketches on paper two feet square, and pretend you are making a thumb-nail sketch. It’s good fun, and not as easy as it...
sounds, because just because a sketch is rapidly done is no excuse for bad drawing, and good drawing, which is largely suggestion, is not only much more effective and interesting than the painful rendering of every part of a sheet, but is infinitely more difficult. If these efforts are sincere attempts to make a truthful sketch, and “truthful” does not by any means imply “photographic,” it will be rather surprising to note the greatly increased facility when it is necessary to make a careful and accurate drawing.

There is not any need to confine these overgrown thumb-nail sketches to black and white. With large sheets of rough paper and big brushes the same can be done in water color. Draw with the brush, and try again for effectiveness from simplicity. Think of Cotman, who could do a tree with one wash. Run washes as wet as possible, and if they drip off the board onto your lap, get a raincoat, but don’t run them any drier. And it is also good to remember that a palette of seven colors is twice as good as one of fourteen; and that since pure colors are expensive, there isn’t much sense in mixing three of them to make mud; and that inasmuch as good paper is also expensive, it isn’t a bad idea to leave as much of it showing as possible.

The thumb-nail sketches here shown are for the most part studies for larger sketches. Others were just made as experiments in the arrangement of values, and still others were copied from pictures, in an attempt to discover their basic patterns. The more of these you do, the better you will like them, and the more reasons you will find for continuing. They keep your pencil moving when there isn’t ordinarily time to sketch, they encourage breadth and boldness, qualities which will begin to appear in your more careful work, and by the use of vague and indistinct forms will stimulate the imagination, and in this way will help to get rid of tightness, which is the one thing, more than any other, that will prevent one from making decent...
THUMB-NAIL SKETCHES BY GEORGE NELSON SHOWN AT EXACT SIZE

1 and 2, Studies of pattern in etchings by Brangwyn—a very good thing to do occasionally; 3, Study for a water color, Church, Granada; 4, A careful study with slight suggestion of details; 5, An experiment in forms and values; 6, Study drawn carefully but at small size.
sketches. Ruskin on this all-important point has something to say, in his comparison between Reynolds and Hobbema: "A few strokes of the pencil, or dashes of color, will be enough to enable the imagination to conceive a tree; and in those dashes of color Sir Joshua Reynolds would have rested, and would have suffered the imagination to paint what more it liked for itself, and grow oaks, or olives, or apples out of the dashes of color at its leisure. On the other hand, Hobbema...smites the imagination on the mouth, and bids it be silent, while he sets to work to paint his oak of the right green."
PENCIL POINTS FOR JANUARY, 1931

FROM A PENCIL AND WATER COLOR DRAWING BY JOHN RUSKIN
LOGGIA OF THE DUCAL PALACE, VENICE

Courtesy Metropolitan Museum of Art, New York
More About the Stair Rule
As Criticized Last January in Pencil Points

By George Eichenlaub

Since the Pennsylvania State Code of Regulations with regard to Stairways seems to be based in large measure on certain Standards that appeared in the National Safety News for February, 1927, as published by The National Safety Council, it may be profitable to examine that work—especially since the Council has done much good and might be regarded in some measure as authority (which reacts to add danger to any statement if it be not fully correct).

This article, which is by Mr. H. W. Mowery, is illustrated with a convincing graph, reproduced on page 12, bearing a title "Approved Standard, Workmen's Compensation Service Bureau," which again has the earmarks of authority. In a word, it appears as though any Architect or Engineer could now discard his older rules or notions, paste the article up in the drafting room and let all and sundry be guided thereby; an easy way to settle all argument or doubt and forget that for more important or lucrative activities.

The graph is based on a $17\frac{1}{2}''$ sum of run and riser rule. Various combinations of rise and run with angle of pitch are handily worked out in the column to the right. Now it will be noted that the graph is evidently intended for use in design of any stairway. It is short, concise, and universal, a very good point in its favor, if true or possible. Since I, however, have found no short-cut rule or answer after measuring some two hundred seventy stairways, it is natural for me to conclude that this graph is another attempt at a satisfactory answer—but not a conclusively final one.

So far, it is my thought that Stairways fall into "Several" classifications the requirements of which all differ. Broadly, they are Public, Semipublic, Private, Industrial, and Activital (where we have motion as on a ship, or visual movement as active machinery). These, in turn, are all again split into Interior and Exterior or exposed conditions, each further influenced by the width of the stair, its position in the plan, materials and colors used and type of nosing, if any. Emergency Exit Stairways would be another classification, but will not be covered here, except by saying that we think the section on "School Stairs" may be closest to the ultimate answer to this question.

Solve all this in one short rule, regulation or graph and we at once have a masterful disposition of the matter that should compare with the ultimatum of a Mussolini or a Bolshevik dictator. Well—a good job anyway.

"It can't be done" has no place in our scheme of things, but no attempt is here being made just yet to work out such an universal rule. Some reader may attempt it and welcome; we surely are much interested. The State of Pennsylvania, however, has not been deterred. The new Theatre Code, as published, is before me and blithely states in effect that "Stairways shall not exceed $17\frac{1}{2}''$ in the sum of rise plus run and shall lie within limits of pitch at 33 and 36 degrees and stairs over 8'-0" wide shall have an intermediate hand-railing." The State also has, for early release, a like or similar ruling to apply on all new public, semipublic, and industrial work. Now, we are asking the reader again to write the Department of Labor and Industry at Harrisburg, Pennsylvania, in protest. Very many must do this or the State will think it unimportant.

So much better if you will check up by measuring a few stairways that seem best and safest; you will learn much at small expense of time, equipment, and effort; only four measurements and you are in possession of good information of lifelong value. All that is needed is the rise, the run, the tread, and the width of stairway—then a note on color, material, nosing, and classified use. Then figure it up and get a surprise. If you drop me a line on your reaction or a copy of your Harrisburg letter, it may help toward the evolution of a rule—perhaps.

Getting back to the original thesis, the first graph, called "Approved Standard," shows "Preferred" Pitch of 32, 33, and 35 degrees, $17\frac{1}{2}''$ sum, with riser-run ratios of $6\frac{3}{4}'' \times 10\frac{3}{4}''$, $7'' \times 10\frac{1}{2}''$, and $7\frac{1}{4}'' \times 10\frac{1}{4}''$ respectively. The graph shows at a glance that in Pennsylvania you are hereafter limited to $7'' \times 10\frac{1}{2}''$ and $7\frac{1}{4}'' \times 10\frac{3}{4}''$ or proportionately less as governed by the pitch. Now let us consult the Eichenlaub Graphs shown herewith and see how we all check up.
After some hours of study, we have selected a few graphs of Public Interior Stairways. Though we make an effort to be lucid and simple, we quickly find the matter on file so complicated and even contradictory that the task is extremely difficult. (To think that lawmakers are not often deterred by such mere considerations!)

But let us worry along. On our graph, A-3 design shows an “Approved Standard Preferred” (G-1) and also “Pennsylvania Legal” stairway at \(7\frac{3}{4}\)” x \(10\frac{3}{4}\)” and 35 degrees pitch. Four of such legal and preferred stairs are found (same graph “A”) in a commercial building and department store of importance built in 1914. The stairs vary in width from 5’-0” to 6’-6” and flights vary from 8 to 20 steps. It is only fair to note that all treads are covered with new checkered rubber and have corrugated 1/16” thick brass edging to stop rubber from curling at the step-edges, which is hazardous any time. All these stairs are rated by us: “Stiff, ungainly, tiresome. All are bad, but hardly dangerous; too much rise or not enough run. Golden oak finish; good natural light; 11/4” nosing. A general stiff and square appearance and nosings, has 1/4” nosing too. But it is unusual good” stair proved “unusually good” of a small jewelry business. Note that the use is now considered “Auxiliary to Elevators.”

In the same graph, A-4a is 7” x 113/4”, not in accord with “Legal or Standard,” and is marked IDEAL—and with only a 1/4” nosing too. But it is again only fair to say that the first flight as referred to has only six steps and the approach is a right turn so that no one can attempt this stair at fast or running speed. Then the A-5 is 7” x 11” x 1” = 12” tread, 30 in one flight, 4’-6” wide, and is nearly good. The same stairway without tread coverings and with shorter flights, as exposed in Sa, is a distinctly good stairway although not in accord with “Approved Standard” or “Pennsylvania Law.”

In graph B we find a group of stairs evidently governed by the \(17\frac{1}{2}\)” rule. The B-7 design is also **Very Good.** Consulting the graphs shown in the January, 1930, issue of **PENCIL POINTS** we find more material for good comparison and judgment, which again does not lead to any reconciliation with the “Approved Standard” or any other rule so far proposed.

Now, to confound the reader further, let me cite this page from concrete experience. In 1913, the author had to design a stair leading to the mezzanine offices of a piano business establishment where hundreds of all manner of people came to pay their weekly dole on furniture purchased. They were mainly women, old and young, and usually in groups of two or more. The stairway was of wood and built as \(6\frac{1}{2}”\) x 11” x \(1\frac{1}{2}” = 12\frac{1}{2}\)” treads, the limit of the \(17\frac{1}{2}\)” sum rule; up 14 in one flight and 3’-6” wide; no tread coverings used. One side was open to the store and equipped with a light “Banister.” The stair was finished in white with mahogany treads and railing-cap. This stair proved “unusually good” for its purpose. Now the sum is \(17\frac{1}{2}\)” and the pitch 30 degrees which is within the “Approved Standard Preferred” limit, but lies outside the Pennsylvania State requirements. Does this prove anything? Let us see.

In 1926, this same stairway was sawed to a width of 2’-9” and placed in the rear of the same store leading to the same mezzanine now converted to be used for a private office and for the storage or packing space of a small jewelry business. Note that the use is now quite different and the stair much reduced in width—same railing, open one side as before, and the identical stairway in so far as rise and run are concerned. And —it now rates as “Not so good; too easy in pitch and riser height for the purpose served.” Therefore, it is evident that the same rule cannot apply in both “conditions of use,” because even the same identical stair does not fit two conditions—in the Public case.
being "Near Ideal" and then "Not so Good" for the Private and the Industrial Condition.

Just one more page from experience. In the year 1900, my honored daddy built him a house—one of the finest in the city for that day. For the first time I heard talk about the Stairbuilder—his skill, his art, his specialty which marked him as a craftsman apart. (Indeed, it were well to humor him some, even as one should the Architect.) It became known that our stairway was going to be one of supreme merit and quality, one of the finest. Mr. Althof, himself and no other, was to do this job and was duly engaged. In due course, this square open stairway in the square main hall took shape in all the glory of its quartersawed oak, turned spindles, goosenecked rails, newels and urn-shaped finials of thin and carved—Golden Oak. And many came who admired the job. As for me, I was too young to know real beauty and now, methinks, perhaps I am too old. Be that as it may, the fact is this: that stairway was stiff, ungainly, tiresome in use and actually near dangerous—and long before design or dimensions meant a thing to me. Witness this; within one year, no less than two of the beautiful (?) urn-finials had been pulled off by stumblers and had to be replaced. Certainly, my father's family and guests always had good beer and ale, but I maintain this would make no difference if the stair had been truly right. In the last January issue we spoke of a stair that was truly right, one that had come through unbroken since 1802 and for a long time had been used in an hotel where a bar and really "strong stuff" was a "business." Checking further against my father's house, the mother, brother, and others were lately and specially interrogated and, in fine, also agree that something was not just exactly right, though they could not say just what it might be. Therefore, my rating sticks "Not so good." And time passed—until in 1922 this now practicing architect took the father's house over, trimmed off the rotting "gingerbread" and converted the home into a two-family apartment. The lower flight of stairs was pried loose and swung around against the west wall, the railings were broken down and walls took their place. The width of the stair was unchanged, rise and run remained as was, even the golden oak was retained and brightened up with new varnish (I didn't have to live there any more), and the job was done and has been continuously occupied since at a good rental. Imagine my surprise though, to find that this stairway had now become a remarkably good stairway. Now it earns a mark of "Very good." It measures $7\frac{1}{4}'' \times 10'' \times 1\frac{1}{2}'' = 11\frac{1}{2}''$ tread, 3' 6" wide, and is now a 12-step flight, right (L) turn landing and a 7-step flight to the second floor; no wall rails used and none required; no tread coverings.

Some one may discern that in both the above cited instances, when the other architect did the job we mark it minus and as soon as this architect gets there and moves the stairway—presto! it immediately becomes "Good." Well—that occurred to me too, so I got me some good cigars and a best smile and ap-
GRAPH B—GRAPHIC ANALYSIS OF STAIRS IN MODERN OFFICE BUILDINGS

GRAPH C—GEORGE EICHENLAUB'S ANALYSIS OF SCHOOL STAIRS
proached the first twenty-five passers-by regardless of age, sex, or appearance. From these I got nineteen to twenty-five to pause in some doubt, mount the stairs, come down, and then return at greater speed without putting down their bundles, if any. Thereupon I questioned them negatively something like this: "Why are those steps so uncomfortable?" "Would it not be a good idea to have a law or ordinance compelling people to put in better stairs?" The concensus of opinion was "Those steps are not uncomfortable," and I could not shake them on that either. Instead they mainly wished their own stairways were "half so good" and so on. In fact, we rented the upper flat to one of those ladies who was something of a crank on stairways herself. Most of the people thought "a law would be a good thing," but since this is something of a common American trait, we attach no importance to that; some day we Americans will be fed up on this law business.

My deduction and rating "Very good!" is really gained from these people and not from myself, but I do urge that we must not have a law about it until such time at least when we generally KNOW more about the subject.

The stairs shown in the graphs so far include the work of George B. Post, William B. Ittner, Arnold Brunner, Alden & Harlowe, Dennison & Hirons, etc., none of whom need any introduction here. We have a right to suppose if they say a thing is right, the argument is about settled—but such is far from the case. It merely proves to us that "Good and Final Stairway Information" is not such a common and settled commodity as we have all of us pretty much supposed, including the best known firms, as noted above, in the profession.

Coming back to the National Safety News article, Mr. Mowery does not fully agree with the No. 1 "Approved Standard" graph either, for he proposes another rule, to wit: "The best formula for determining tread and riser dimension is: 25\(^\circ\) minus tread width over-all divided by two equals the riser height. The angle is preferably between 30 and 36 degrees with the horizontal." Space does not permit further analysis here, but this rule, too, will not be found to work out or check with our graphs and experience or with opinions cited by this author. Mr. Mowery then uncovers the first word we have so far seen or heard concerning the influence of "Materials" upon stairway design, for safety and comfort. I maintain here that these two last elements of safety and comfort are closely synonymous or equal to each other. His words are in full agreement with what I would say was "durn good," 7\(\frac{\text{in}}{\text{in}}\) x 11\(\frac{\text{in}}{\text{in}}\) = 12\(\frac{\text{treads}}{\text{treads}}\). True, the nosing had only 1\(\frac{\text{in}}{\text{in}}\) projection, the slippery steel nosing edge was dangerous, and the width of stair was excessive without handrails—but, even so, the user should have a better opinion in his mind. The figures were 7\(\frac{\text{in}}{\text{in}}\) x 11\(\frac{\text{in}}{\text{in}}\) and no mistake; what could the trouble be? And now this engineer came to a most enlightening conclusion; perhaps after all, architecture as such—mere good appearance as color, line, etc.—has its place of positive importance in the practical application of methods for better safety and the "Safeguarding of Life, Health and Property"—a stated prime purpose for the Pennsylvania regulation, which is apparently wholly ignored by all lawyers.

Puzzled and thinking, my way continued to another grade school where I found a brand-new, to me, type of stairway built about 1924. Graph C-8 shows this design. It was of a light brown magnesite concrete with mason-type safety treads 4\(\frac{\text{in}}{\text{in}}\) face, level and nicely placed in the outer edge of each tread, designed as 5\(\frac{\text{in}}{\text{in}}\) x 10\(\frac{\text{in}}{\text{in}}\) x 4\(\frac{\text{in}}{\text{in}}\) = 11\(\frac{\text{treads}}{\text{treads}}\). The shiny top of the 4\(\frac{\text{in}}{\text{in}}\) lead treads offered splendid contrast to the brown of the concrete for visibility in use; the steps measured only 2\(\frac{\text{in}}{\text{in}}\) short of the 17\(\frac{\text{in}}{\text{in}}\) sum as shown in the "Approved Standard" graph. While these agree with the above by Mr. Mowery, he says nothing about color, or about architecture—meaning appearance—and when we started out on this voyage it was with the same purely engineering, safety, or utility point of view, which is now found to be insufficient to explain some characteristics we have found.

**SOME SCHOOL STAIRS: SEE GRAPH C**

In a grade school I ran into this curious combination of stairs (I incline to term this "semipublic use," since the scholars live here a goodly portion of their waking time and so can and do accustom themselves to the conditions as found), done about 1914 by a politician architect who is now exclusively and better engaged as a politician.

Graph C-7 design shows the condition. The stair was built of composite steel, painted black and black-grey, with asphalt-mastic filled treads, a width of 15\(\frac{\text{in}}{\text{in}}\) between walls, no intermediate handrails, one flight of 14 steps in the corridor to double doors with a clear opening of 6\(\frac{\text{in}}{\text{in}}\)—a beautiful "bottle-neck" if you ask me. On entering the door and first glancing at this black forbidding prospect, with the head of the stair above my eye-line, the apparent pitch and general appearance were such and the negative reaction in myself so pronounced, that instinctively the job was marked "Bad" even before measurements were made. Then, carefully—a walk up and down—and again up and down at greater speed, and finally the conclusion that something must be wrong with me. Possibly this new "Stair-legitis" was setting in so that any old stair was become a good stair to me. Again up, and again down, but it still remained not quite a "good" stair—not so bad as I first thought, true, but still not good. Then it was measured and imagine my great surprise to find that the rise and run were just about what I would say was "durn good," 7\(\frac{\text{in}}{\text{in}}\) x 11\(\frac{\text{in}}{\text{in}}\) x 12\(\frac{\text{treads}}{\text{treads}}\). True, the nosing had only 1\(\frac{\text{in}}{\text{in}}\) projection, the slippery steel nosing edge was dangerous, and the width of stair was excessive without handrails—but, even so, the user should have a better opinion in his mind. The figures were 7\(\frac{\text{in}}{\text{in}}\) x 11\(\frac{\text{in}}{\text{in}}\) and no mistake; what could the trouble be? And now this engineer came to a most enlightening conclusion; perhaps after all, architecture as such—mere good appearance as color, line, etc.—has its place of positive importance in the practical application of methods for better safety and the "Safeguarding of Life, Health and Property"—a stated prime purpose for the Pennsylvania regulation, which is apparently wholly ignored by all lawyers.
steps were placed in the straight line of the main corridor travel, near its center of length where the steps could not possibly be avoided, and were 10'-0" wide without handrails in one flight of nine steps and deficient in nosing—still one would be almost compelled to think these stairs infinitely better and superior to the ugly black flight just previously cited. And such was my first personal reaction, due to this good appearance alone, although my stride seemed somewhat restricted in the use of the said stairs.

Now for a check-up and investigation to discover if possible, as Uncle John, an old attorney, says, “if the truth lies.” The children did not think so badly of the black and worn steps with their trippy steel nosings that I had mentally condemned, but have now marked “Good” on the strength of their say-so. The last are marked “Not Good” for the same account. Even candy could not shake the opinion of my own kids, aged 7, 9, and 11 respectively, that these last-named 6½" stair. Evidently good appearance alone does not have great influence on the child-mind when we consider steps. After several years of use, the children have rendered their verdict and I conclude that these two stairways lie near the end-limits of school-stairs practice regardless of law, rule, or regulation.

Again I come back to our 7" x 11" starting point for design and here I would use seven minus and eleven plus to design about a 6¾" x 11¼" x 2" = 13½" tread. None just like that are found, but it approaches the IDEAL Public Library Stair in fine white marble that was shown in last January’s article in PENCIL POINTS.

Public Schools and their stairways probably receive the maximum of interfloor travel. It is almost fascinating to stand clear and observe the whirl and rush and variety in use of such stairs when the gongs ring the classes in and out. The same graph “C” shows some excellent stairways in a high school by Mr. Ittner, which are not in accord with any rules—and now let us investigate further.

Graph E-2, 3, and 4 designs are from an older school built in 1899 by the late Joseph Frank, a German-trained architect who thought much of his scrolls and “durmelee” in common with those of his day, but who surely knew his stairways, as we shall see. The three stairways are near IDEAL and are found as 6⅞" x 11½" x 1½" = 13¾" treads for an average; they are of good oak without tread coverings, 8'-0" wide and have no trick-railings such as are found in more recent schools. In all the years, numbering thirty in use, these stairs have caused no accidents that inquiry could discover. The children like these stairs and I can personally vouch that they are just fine, because, as a youngster of 14, I attended
MORE AN ENT THE STAIR RULE

GRAPH E—GEORGE EICHENLAUB'S ANALYSIS OF GRADE SCHOOL STAIRS

GRAPH F—MORE GRAPHS FOR PUBLIC AND SEMIPUBLIC STAIRWAYS
this newest public school. If these risers were increased from 6\frac{1}{2}" to 6\frac{3}{4}" or even 7" it is my opinion that the stairs as found would be even better, and if the nosing were made 1\frac{1}{2}" or 2" projection the added tread width would help design 2. I have doubt about 3 which is now 13\frac{3}{4}" tread, although without question its 6\frac{3}{4}" riser height is insufficient.

In graph F-3, 4, and 5 we find similar construction and treads with only 6" risers, built in the same city about 1890 and labeled "Not good." This would seem to support my ratings and ideas too, for it will be noted that the sum of the latter, now that it is figured up, is 17\frac{1}{2}" in accord with the now, I hope, condemned Rule. The experience of either the architect or of the Board here must have shown the stair with 6" rise to be not so good, and in the subsequent job of 1899, as cited, the riser heights were made 6\frac{1}{4}" and 6\frac{3}{8}" which we also have rated as much better, though still not quite "Ideal."

Graph G-2 design finally does show one stair marked "IDEAL." It is not in a school, but in a City Hall where the use is public, but much akin to school use. It is also of wood and has the same general characteristics, but is measured at 6\frac{3}{4}" x 11\frac{3}{4}" x 2" = 13\frac{3}{4}" treads and is ideal in spite of its shiny, flat cast-brass and potentially hazardous all-over tread coverings. I am much pleased to mention that this about bears out the recommendations just made regarding improvement of school stairs. Of course, if this had not been so, I might have had to rub this out and rewrite. Since it is so, however, it helps strengthen belief in our graphs and also in opinions so far developed and expressed.

It may be noted now, that the school stairways are generally wider than the commercial ones as exposed in the graphs A, B, and D and that the school stairs are somewhat easier in general pitch to gain the same mark of goodness.

I now think that the angle of pitch in degrees is of relative unimportance, since the rise and run determine the pitch and if they be correct it naturally follows that the pitch must be right, too. To describe and show pitches in degrees only tends to complicate further a subject that should be very simple, but has not been so found up to this time. The pitch therefore is left off on some and will be on all future graphs. I hope law-making bodies will also try for this simplification. I also still feel, with growing conviction, that the 17\frac{1}{2}" sum of riser and run, instead of being a limit, should lie near the center of any requirements or used as a starting point for the designer. In new design we like our 7" x 11" better as the intermediate mean, the stairs to be somewhat steeper for private or residential work and somewhat flatter for public work in general.

**NOTE:**—Next month Mr. Eichenlaub will discuss other classifications of stairways such as Private, Activital, etc., in an article of the same approximate length, which will show how requirements do vary.

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**GRAPH G—GRAPHIC STAIR ANALYSIS BY GEORGE EICHENLAUB**
The Pyramider
An Architectural Story

As Told to W. B. Warner by R. W. Meadows, Architect

A young architect, handling his first court house contract, would hardly expect to have the experiences pile up on him in the manner that fell to my lot when, at the age of twenty-nine, I found myself in charge of such an operation. It was in the third year of my independent practice in the city of D......, in the Middle West. The pretentious structure I had undertaken to produce was to be erected in R...... City, a county-seat town about a hundred miles distant.

The five members of the county board included four Scandinavian Republicans and an astute Irish Democrat, all farmers. The personnel of the Republican group varied from one election to another, but, although the county was overwhelmingly of that persuasion, yet honest old Denny Malloy was returned unanimously every two years, and had been chairman of the board for at least twelve. Some said it was because the "Scandies" couldn't trust each other, but they all knew they could trust Denny.

That the chairman ran things to suit himself was evidenced in his selecting me for the architectural service, over the heads of many applicants of more experience—simply because he knew my father. A ring of crooked architects and contractors was said to be operating in connection with public buildings in that vicinity, hence Denny proposed, first, to employ a man they could trust. Then, if he happened to provide them with a building of the right kind, so much the better.

Naturally, I had heard something of the deals that had been pulled off, but I knew that they could only be worked with difficulty without the connivance of the architect and at least one strong board member. Working with "Honest old Denny," I felt fairly safe.

To be sure, I had, to begin with, the usual difficulty of "cutting the cloth to fit the pattern." The original appropriation was $150,000, and several of my overly-sharp competitors had eagerly offered to "guarantee" that they could produce the desired building for the money. But I had helped the county attorney to demonstrate to Denny's satisfaction the worthlessness of such "guaranty," based only upon incomplete sketches, without specifications.

After I had been employed, Denny admitted that the board was more interested in knowing that their funds were neither wasted nor stolen than they were in holding the architect and contractors strictly to the appropriation. I therefore made a careful survey of requirements and planned accordingly, and Denny seemed not at all worried when I told him my building would cost about $175,000.

My first setback came when, at the opening of the bids, we found ourselves with only two on hand, and no others promised. Seven other contractors had returned the blueprints and specifications under various pretexts. One bid came to $185,000 and the other to $195,000. We rejected them and readvertised. I made a few minor changes in the specifications, but Denny assured me it wasn't necessary to get a price within my estimate, just only to be sure that they were having real competition.

Apparently, they had it the second time, for the bids ranged from about $174,900 up to $192,500. Strangely enough, the man who had bid high the first time, Jim Perry, was now low. The former low bidder, Judson, had come down $6,500 in consideration of my changes, which I deemed about right; but I could not understand how Perry could cut his price by $20,100. I learned from Judson, who was not in the "ring," that he had thought, because I had broken into their game, that he might do likewise; but they had been too shrewd for him. It was his opinion that none of the others had figured the job, but submitted figures as directed by Perry, who had learned from Malloy the price I had estimated, and had merely bid accordingly. Judson assured me that I would have my hands full. He proved a true prophet.

Now, it happened that Perry, who operated under the name of the Dependable Building Corporation, had once been a general contractor in my own town (under his own name); had failed under circumstances not to his credit, and had betaken himself to new fields; hence the incorporation. Before the contract was awarded, I therefore told Denny that I didn't consider the low bidder as "dependable" as its name implied, and advised sending out a committee to investigate some of the work it was doing. He agreed to this and appointed me a committee of one for the purpose. I demurred on the grounds that my prejudice might render me unfair. But they sent me, nevertheless, saying I would know best what to look for.

I visited, in different places, a court house, a city hall, and a high school, all under construction, and a public library, just completed. In each case, I found the architect and the owners' representatives well pleased with the work of the Dependable Building Corp. Oddly enough, I was told, in each instance, that the company was doing excellent work in spite of the fact that it must be losing money on the contract. In the case of the library, Perry was said to have admitted that he "had gone down in his pockets" to make up a $10,000 shortage on his $80,000 contract. It was also rumored that he had lost money on a
schoolhouse, the only other work so far completed by the new corporation.

However, having received no adverse criticism of the company's operations, I was constrained to withdraw my objection, and the contract was accordingly awarded to Perry, conditioned upon the deposit of an approved surety company bond, which was duly forthcoming. Could I have divined the clever machinations of the unscrupulous "pyramidier," as I came to understand them later, my embargo would most certainly have stood—and I would have been saved a deal of trouble.

Perry's general foremen were the best he could find, always; instructed to do whatever the architect demanded, so I experienced no trouble from that source. This left the "general manager and purchasing agent" of the Dependable Building Corp. free to devote his own time to closing new contracts and awarding his "subs." In both of these functions, his system was nearly perfect, as we shall see. The thing that beat him was the weather. To be sure, his Nemesis had to overtake him sooner or later; but he had not foreseen the long, cold winter that closed in on him before he was quite ready to quit. He might have gotten the other half of his million.

After five months of smooth sailing on our court house, I was congratulating myself upon my good fortune in having the work so well handled. My only friction with Perry was a regular monthly quarrel over his payments on account, the which he could collect from the county only on the certificates of the architect. These were never large enough to satisfy him. He was the smoothest salesman I have ever encountered, and nothing but my positive knowledge of the man's true character saved me from falling for his assiduous "courtship."

As a basis for my monthly estimates of work done and materials supplied, he filled what purported to be a detailed statement of what the building would cost. Compared with a similar statement of my own compilation, only his total agreed. His "estimates" of excavating, concrete work, steel, and other items at the beginning of the job were nearly double mine, whereas such matters as cabinet work, painting, decorating, and hardware were ridiculously low. Had I permitted myself to be led by him, he would have drawn nearly one-half his contract price before the job was one-fourth done.

The friction between us on this score increased from month to month and was brought to an impasse on the first of December when I intimated to him that I would issue no further certificates until I had evidence that he was paying his bills on our work. Public buildings (in that state, at least) are immune from ordinary mechanics' liens, hence Perry claimed that the conduct of his affair was none of my business, regardless of what the contract said on the subject, so long as his creditors were not complaining. At this time, he had received about $40,000 on account, but all that I could find that he had paid out on our job had been for local labor and freight bills, not to exceed $5,000. Apparently, neither the excavating contractor nor any of the local supply houses among whom he was distributing a minor patronage, was crowding him, nor had I received a complaint from any of his larger creditors. I reckoned that he had about $10,000 due December first, chiefly for steel and stone.

I had sent inquiries to both these concerns regarding their accounts and the stone company's representative met me at the station, when I arrived in R... City at noon on December second. He said Perry was furious at me for "injuring his credit," but that the stone company appreciated my concern for their interests, inasmuch as they had received to date not a penny of the $12,500 that had thus far been allowed for cut stone. Inasmuch as they were also entitled to an additional five thousand of the December payment, I offered to support a demand for the entire $10,000 I was just about to allow. But Smith (the stone man) said that Malloy had a prior demand from the steel company for $3,000, hence his stone company would be content for the present if they were paid the remaining $7,000 of my certificate. He added that they got all of Perry's business and considered him perfectly sound financially.

Arrived at the board meeting, I found Perry fuming, threatening and cajoling, by turns; evidently impressing all the board members except Malloy, who appeared quite imperturbable. Perry asked for a minute's private conversation with me in a committee room, whither we adjourned. One of the board members suggested that I'd better have a bodyguard.

"What's this you're trying to do to me, Will?" Perry opened.

"For instance?" I countered.

"Why damn it, damaging my credit by writing these letters to my subcontractors. Now, look-a-here, Will, you're a young man, just starting in your profession, and I'm in position to do you a lotta good, if we can work together. This ain't the only court house to be built in this part of the country, but, by God, if you're going to treat me like this, I'm right here to tell you that you'll never get another. Why, this is the damnedest outrage—"

"Supposing you cut out the cussing and tell me how you propose to pay these bills," I suggested. "That happens to be about all I'm interested in right now."

"Well, then, young fellow, all I have to say is that it's none of your damned business how I run my affairs. I've told you that before and you might's well let it sink in. This is a public building, not subject to lien, and I'll not submit to your interference, by God, if I have to take the matter into court. But, now, look-a-here, Will, you don't understand my situation," and the consummate actor changed his tune to supplication. "I'm only a hired man of this building corporation (ninety-eight per cent, of the stock was in the name of his grown-up daughter), an', if I don't make a showing, I'm likely to lose my job." Real tears came to his eyes, as his emotion (?) overcame him. I was uncomfortable, but not fooled. "My God, Will, you don't understand what you're doing to me—"

"No," I admitted, "and I don't much care. So,
cut out the play-acting and say the rest to the board.” I opened the door.

“Well, damn you! I’ll get you for this,” I heard him say as we returned to the session.

“Come to any agreement?” Malloy wanted to know.

“Yes,” I said. “Mr. Perry is going to pay some of his bills.”

He glared at me and then took Smith into the room we had just left. When they returned, he exhibited a receipt from the stone company for $10,000; then said he’d go over to the bank and telegraph $3,000 to the steel contractors, which he did.

While Perry was gone, Smith told me, confidentially, that he had been persuaded to accept two notes, signed by the Dependable Building Corp., without recourse to Perry, for $10,000 each; same to be credited on account, in lieu of a cash payment. Smith appeared to be quite satisfied. I later learned that the local banker was equally gullible. He accepted a similar note for $13,000 and then placed that amount to the corporation’s credit, $3,000 of which was wired to the steel company. Its receipt was promptly wired back, and I had no alternative but to issue my certificate. I had called on some of the local dealers, none of whom appeared at all anxious about their account with Perry, apparently replying implicitly upon his promises. He again threatened me for “injuring his credit,” but I had sized him up as a bully and was less interested in his conversation than in his actions. I didn’t know about his having borrowed ten thousand dollars more than he needed at the bank, but I wondered what he intended to do with the equal amount he received from the county. I eventually found that, as agreed, he had left two thousand in the bank and had checked out the remaining $18,000 for transfer to his hometown bank, whence he had left two thousand in the bank and had checked the remaining $18,000 for transfer to his hometown bank, whence he had.

December that year was but a week old when winter came in to stay, and all construction work in that section was forced to close down. This must have proved most disconcerting to the enterprising Perry, for only by continuing his operations could he hope to draw more funds and keep going. He closed two new contracts, but they couldn’t help any. On January second, I sent up a certificate to the board, to pay the contractor $3,000, to be divided equally between the steel and excavating contractors, provided there were no other claims filed. There was none, but a telephone call from Malloy advised me that friend Perry was again on hand, “crossing the mouth,” and demanding another ten thousand which he said was my understanding he was to receive to take up one of the stone company’s notes. Of course, there had been no such understanding, but Malloy insisted upon my coming up to explain to the board.

Again, Perry wanted a private talk with me, but I said it was too evident that we needed witnesses to our conversation, hence I would talk in the presence of the board. He thereupon addressed himself to them, using the character of pleading in which he was so adept.

Said he, “I admit that Will here is a capable enough young fellow, but he hasn’t had the experience in the building business that I’ve had, an’ he’s trying to make a record on this first big job of his at my expense. The figures on that statement (in Malloy’s hands) show that I’ve spent twice as much to date as he’s given me credit for and I ought to have the ten thousand he promised me to take up the stone company’s note in addition to the measly little three thousand he’s allowed me to pay on my other bills. I can stand off the steel company. They know my credit’s good, but I ought to pay some of my local bills.” He continued to plead with tears running down his cheeks, telling how badly he needed living expenses for his wife and family, etc., etc. Two of the board members were sniffing, but there was nothing to be learned from Malloy’s poker face. Presently, Carlson, one of the members, while Perry paused to wipe away his tears, addressed the chair: “Val, I tank sure Mr. Perry knows better vat his stuff cost as Mr. Meadows, cause he pays the bills. I move that we instruct Mr. Meadows to change his stíc’cate to tirteen thousand dollars.”

“Is that all right with you, Mr. Meadows?” asked the chair.

“I have no objection to the motion,” I said, “but it wouldn’t change my certificate. It happens that the contract states that the amount of the certificate is supposed to represent my idea of what is due, not that of the board or Mr. Perry. And, as to a comparison of my estimate and his, you might ask him how he expects to finish the building at his contract price, if these early items are costing him twice what they should. No, gentlemen, so far as my estimate is concerned, the amount stands. Inasmuch as neither the steel contractor nor the grader seems to be looking out for their interests, however, I’ll waive the point of their receipts, if you prefer. But I want it distinctly understood that Mr. Perry’s statement that he had an understanding that I was to allow him ten thousand dollars 1/2 of the board or Mr. Perry. And, as to a comparison of my estimate and his, you might ask him how he expects to finish the building at his contract price, if these early items are costing him twice what they should. No, gentlemen, so far as my estimate is concerned, the amount stands. Inasmuch as neither the steel contractor nor the grader seems to be looking out for their interests, however, I’ll waive the point of their receipts, if you prefer. But I want it distinctly understood that Mr. Perry’s statement that he had an understanding that I was to allow him ten thousand dollars.”

“Now, see here, Will—” expostulated Perry.

“Just a moment, Mr. Perry,” from Malloy, “Mr. Meadows has the floor.”

“Thanks, Mr. Malloy. I was merely going to add, that, if Mr. Perry is so willing to invent a story about the note, doesn’t it occur to you that his so-called estimate of costs might be equally undependable? And you want to bear in mind that he would have a direct interest in falsifying his statement, while I would not.”

One would have thought that Perry would have resented being called a liar in such plain terms, but he was only intent on getting that extra money. He evidently had Carlson primed, for the persistent Swede was ready with another motion: “Den I move that we allow Mr. Perry thirteen thousand dollars witout any stíc’cate from the architec’."

“What effect would such a payment have on our bond, Mr. Meadows?” the chair wanted to know.

“As I understand it,” I said, “any payment made
otherwise than on your architect's certificate would render your bond worthless."

"Then, as I see it, Mr. Carlson," said the sage old chairman, "the only motion the chair can entertain is to pay the Dependable Building Corporation the amount of the architect's certificate."

"With a proviso," I stipulated, "that the board waives presentation of the receipts demanded there in my letter."

With that, Perry started to curse me, but Malloy shut him up and the motion was carried. I had to hurry away to catch my train; a most unhappy young architect. My efforts to look after my client's interest were assuredly misconstrued or, at least, unappreciated. My first court house job was going absolutely wrong.

Imagine my pleasure, then, about ten days later, upon reading a letter from good old Denny Malloy, telling me that the Dependable Building Corp. was in the hands of its creditors and he felt that the county owed me a vote of thanks for saving it the $10,000. He wanted me to get in touch with a representative of the surety company and arrange a meeting at R . . . . City as soon as possible.

There were present at this meeting, besides the members of the board and myself, Perry and his local banker, Robertson, the foreman of the job, Bill Fielder, and a Mr. Patterson, Chicago attorney for the bonding company. My train did not arrive till noon, hence the others had been in session some hours before they reassembled after lunch. I learned that Perry and Patterson had come in together on the Chicago Pullman, which meant that the clever rascal had had ample opportunity to "sell himself" to the lawyer. His success at this was but further evidence of the man's wonderful acting.

The two entered the board room together and Patterson handed the chairman a paper, and a copy to me. It was a three-cornered agreement which he had drawn up, appointing Perry purchasing agent and general manager to complete the job, with Fielder as foreman. Perry was to get $100 per month for such time as his duties would demand, and Fielder was to receive $175 per month for full time. I caught Malloy studying my expression and detecting my disapproval. Perry was avoiding me, sitting on the other side of the lawyer who had taken a seat at the long table next to mine.

"We agreed this morning, Mr. Meadows," explained the chairman, "that, inasmuch as Mr. Perry has let to the Blank Fireproofing Co. for a flat $25,000; then the roofing to the Better Insulating Co. for $9,000, and the sheet metal work to the Guaranty Metal Co. for $4,000. (He seemed to have a penchant for round numbers.) Now, I had a price of $18,500 on the fireproofing, $7,250 on the roofing, and $3,100 on the sheet metal. I took this information to Malloy and, for the first time, with definite information to hand, explained Perry's whole system. He was astounded and begged me to go into
Chicago, with full authority to handle the situation with Lawyer Patterson. This I did, and he arranged the details of Perry’s discharge, and the addition of the duties of purchasing agent to those of Foreman Fielder, at an increase of salary; it being understood that Fielder and I would work together in the matter.

Still, Perry wasn’t through. Evidently, he had already collected all or part of his commissions from these three concerns, and it was up to him to deliver the contracts. The roofing and sheet metal people had gone ahead on his say-so and were making the special tiling and cutting and bending the copper. Fielder understood that he was to get at least three bids on each item, but before he could secure two others on the fireproofing, he received word from the Cinder Concrete Co., whose figure I was depending upon, withdrawing the bid. Evidently, they had been advised by Perry’s concern to keep hands off, for both had headquarters in Chicago. The Cinder people had bid to me through a local agent, so I called him up and asked if he was prepared to execute a contract for the work. He said he was not authorized to sign a contract, but I urged him to bring over his correspondence and run through it with me. We found a letter from his company begging him to close the contract without delay, though it hardly meant for him to sign it. However, there was a nice commission in it for him, so, when I offered to sign for the county, he was willing to do his share, and we drew up several copies of his “authority” and sent them out to interested parties. Then we waited results. On the second morning following, came the president of the Cinder Concrete Co., from Chicago, hot after the local agent for signing such a contract. It was the first intimation to the agent that the bid had been withdrawn and he insisted that he was entitled to his commission whether the contract was carried out or not. Now, this commission was twice as much as the “divvy” that President Miner’s company was to get from the Blank Fireproofing Co. for backing out, hence he was ready to weaken. He told his agent that he wanted to talk to me and the purchasing agent and, if he found that we had knowledge of the cancellation prior to the execution of the contract, it would assuredly not be carried out. After talking with him, I offered to accompany him to R . . . . City to interview Fielder.

We arrived at 12:30 and boarded the old horse-drawn bus that would cover the mile to town and to the hotel, for lunch. The bus was full and I rode on the rear step, after whispering to the driver to whip up when he passed the new court house. As he did so, I told Miner I’d meet him and Fielder at the hotel, and dropped off. In Fielder’s little job-office, I went through his letter-file, found the telltale letter of cancellation and transferred it to my pockets; then strolled on over to the hotel and sat down to lunch with Miner and Fielder. I had no opportunity to tell Fielder what I had done, before he had agreed with Miner that, if the letter antedated the contract, the latter might be declared void. However, Fielder’s memory was very vague as to his ever having seen such a letter. But Miner had no reason to question Fielder’s later assertion that he was absolutely certain that all correspondence with the Cinder Concrete Co. must be in that file—and there was no letter of cancellation to be found.

The Cinder Concrete Co. carried out their contract, saving the county $6,500—and we made the other savings also. Of course, we had all of Perry’s creditors to contend with, but we simply turned them over to the court and started afresh. None of them ever got a penny, not even the unfortunate stone company, with its two worthless notes; though we bought the remainder of the stone from Smith at a fair price. We overran the contract amount by nearly $30,000; hence looked to the surety company to make good this deficit. While we were dickering with them, fire destroyed my office and every record of the case; but I found a copy of every paper carefully filed in the office of the county auditor, hence was able to make a complete restoration.

And the surety company settled with honest old Denny Malloy and his board without a lawsuit. I presented a claim for $1,800 for additional services, with Malloy’s approval—but Perry’s influence was still dogging my footsteps. His banker, Robertson, had replaced one of the Scandinavians on the board, in order to assist in winding up court house business (and try to salvage some of his $13,000 loan, which I had to prevent), and the other members had to compromise with him; hence my extras were cut to $1,200, with which I was forced to rest content. It was all the harm Robertson could do me, but he appeared to relish even that.

In my thirty years of subsequent practice, I have continued to find much of romance mixed with the business of building, but that court house job has ever held the preeminence in this respect. And I have encountered other pyramiders, but none to compare with the versatile Jim Perry.
RECTIFICATION
AND
QUADRATURE

TO DEVELOP
A FULL CIRCLE

\[ \frac{180}{\pi} = 57.295786 \]

TO DEVELOP A HALF CIRCLE OR TO "SQUARE" A FULL CIRCLE

\[ \frac{180}{\pi} = 57.295786 \]

TO LAY OFF A RADIAN

\[ \frac{180}{\pi} = 57.295786 \]

TO RECTIFY ANY CIRCULAR ARC UP TO 90

\[ \frac{180}{\pi} = 57.295786 \]

ALSO SEE

FIGURE 122

[24]
The Geometry of Architectural Drafting

14—The Subjugation of the Circle

By Ernest Irving Freese

Editor’s Note:—This article, continuing the series begun in August, 1929, is copyright, 1931, by the author.

Now comes an utterly new kind of geometry: a geometry that transforms circles to straight lines, and straight lines to circles; that divides a circular arc in rectilinear ratio, or a straight line in angular ratio; that converts circular measure to linear, or linear to circular—a geometry that puts a stop to the interminable decimal in “pi” at such a point that the infinite overplus fades to a graphical zero. Call it are-ology—if you like—but it’s far from antique.

For the first time in the history of practical drafting, precise graphical cyclometry herewith becomes a fact. The total graphical subjugation of the circle has been accomplished. You can now abandon all those time-wasting tedious cut-and-try methods of “stepping it off” with all their concomitant accumulations of error. You can now do anything you like with any portion of a circle by means of the simple graphics herein for the first time made known. Moreover, you can do it with such a degree of precision that the same values laid off from mathematical calculation become inexact in comparison. As a matter of fact if it were not for the constructed values of “pi” which I have given on each layout or, in lieu of this graphical pi-value, stated the limits within which the construction remains precise, even a seasoned mathematician would have a terribly involved trigonometrical transaction trying to “figger out” where graphical precision ended and the lopped-off infinite overplus of the transcendental “pi” became multiplied into measurability. Also, said mathematician would have to throw away his cherished slide-rule: for the results of the “graphical” calculations here given are more exact than any “slip stick” could possibly yield—Oh well, let’s have ’em:

FIGURE 122, Diagram “1”:

Make AE any circle’s diameter, and draw EG perpendicular thereto. Make AB equal 113 units, or 9'-5", at any scale, and make BC, perpendicular to AB, equal 16 units, or 1'-4", at the same scale. Cross EG at F with AC. Add three diameters to EF, and the summation EG is the circumference. Is it? Well, suppose the radius DE were a mile—not a scale mile: an actual mile—63,360 inches. Then EG would be less than 1/29th of an inch too long. Now reduce that mile radius by a factor that will bring the construction within the limits of the hugest drafting board ever built, and that 1/29th of an inch overplus will shrivel in the same ratio. Then EG is the circumference. Now, since ABC determines the invariable slope of the pi-minus-three line AC, you can ever after use this same triangle to find the “stretch-out” of any circle whatsoever. Say AK is any given diameter laid off on AB. Then, always, the “rise,” KL, plus thrice the “run,” AK, is the circumference. Nothing easier or simpler could be imagined. But suppose conditions demand that you find a diameter that will yield a given length of circumference. In that case, lay off a line GA at a slope of 113:355, which is 9'-5" rise to 29'-7" run. Lay off GH equal to the given length of circumference, and the perpendicular HJ is the required diameter. Now compute HJ by dividing GH by a sixth-place pi-value, and never in a thousand years will you be able to lay that off. But there it is—graphically—HJ. In other words, precise draftsmanship is here of more avail than six-place-decimal calculation.

FIGURE 122, Diagram “2”:

Make AN any given radius, and draw NQ perpendicular thereto. Establish the slope of AC before, and make PQ thrice AN. Then NQ is the development of the semicircle NM to within less than 1/58th of an inch for a radius of a mile. It is now apparent that the slope of the line QM is bound to remain “as is” for all semicircles. And it can easily be deduced that this invariable slope corresponds to a rise of 18'-10" in a run of 29'-7". Wherefore, if such a line be drawn, and any desired semicircumference QR be laid off on the horizontal, then the vertical ordinate RS materializes the required diameter. Incidentally, the area of the triangle thus formed is the area of the complete circle whose half circumference and full diameter are the rectangular sides of said triangle. Now, calling the radius AN of the circle by the name of unity, or 1, it is plain to be seen that NQ is a rectilinear picture of “pi” correct to the sixth decimal place. Hence, by graphical extraction of the square root of NQ, a line can be found that will be one side of a square of equivalent area to the circle and also equal in area to the triangle MNQ. It’s easy to do. Just make NV equal NA; then bisect VQ at U; then from U as a center, revolve V to W. Whence, WN squares the circle whose radius is AN and whose semicircumference is NQ; and it also squares the triangle
whose right-angular sides, or whose base and altitude, are \( MN \) and \( NQ \) respectively. Again assigning a length of one \textit{mile} to the radius \( AN \), and finding \( NQ \) by the construction shown, it can then be proved that the extracted side \( WN \) of the "squared" circle would not exceed its true length by more than \( 1/225 \)th of one \textit{inch}. I don't know of much practical use for this \textit{squared} circle, but I do know that there exists a whole tribe of "circle squarer's" whose constant endeavor is to materialize it. Eventually, this leads to the madhouse. Wherefore, as a \textit{humanitarian measure}, I shall herein later record a method of quadrature which should stop all further futile efforts for a couple of thousand years—or else aggravate the circle-squarers into a higher state of madness!

FIGURE 122, Diagram "3":

Make \( XY \) the radius of any quadrant, and bisect this radius at \( A \). Draw \( YI \) perpendicular to \( XY \), and locate \( Z \), on \( YI \), by establishing the slope of \( AC \) in the manner heretofore explained. Make \( ZI \) equal thrice \( YA \). Then \( YI \) is the development of the quadrant \( YN \), so exact that \( 1/116 \)th of an \textit{inch} would exceed the difference for a radius of one actual \textit{mile}. Is that close enough? To reverse the process, draw a sloping line \( iX \) such that it has a rise of \( 18^\circ-10^\prime \) in a run of \( 29^\prime-7^\prime \); then lay off \( 1-2 \) equal to any given length of quadrant; then \( 3-2 \) is the radius required to bend the straight line \( 2-1 \) into a quarter circle \( 2-3 \).

FIGURE 122, Diagram "4":

This is the most exact general construction ever evolved for finding the length of any circular arc whatsoever up to a full quadrant. Let \( AC \) be the given arc, with center at \( B' \), and subtending any angle, \( A'B'C' \), not over 90 degrees. Make \( B'B \) equal the radius, and make \( BC \), through \( C' \), equal twice the radius. Now the arc \( AC \), swung from center \( B \), is exactly the same length as the given arc \( AC' \) swung from center \( B' \). Hence, the development of the arc \( AC \) will be the development of the arc \( AC' \). It is found as follows: lay any suitable scale along \( BC \), making the 37-mark register with \( C \); then mark off the proportionate distances clearly designated by the diagrammed scale. Draw \( EG \) parallel with the opposite leg \( B'A \) of the angle, and cut \( EG \) at \( G \) with radius \( DF \), as shown. Now project the tangent from \( A \) to cross \( GC \) at \( H \). The straight line \( AH \) is then the graphical rectification of the given arc \( AC' \), as it also is of the interposed arc \( AC \). Hence, since the angle \( ABC \) is always half the angle \( A'B'C' \), it is evident that, for arcs not exceeding 45 degrees, the point \( C \) is already located on the arc itself. For instance, let \( AC \) be the given arc, with center at \( B \), and subtending any angle, \( ABC \), not over 45 degrees. Then \( AH \), as before, is the graphically-developed length of \( AC \). Allowing a maximum deviation of \( 1/200 \)th of an inch—which is about the width of the finest pencil line you can draw—from the exact length of the circular arc, the minimum full size radius that would produce such a deviation in \( AH \) would be \( 13^\prime-3^\prime \), and it would occur at about 75 degrees; while for a 45-degree arc it would take a full size radius of \( 131^\prime-4^\prime \) to produce the same discrepancy; and at 90 degrees a radius one half the latter. So, you see, this simple rectification can be applied even to full size arcs on any drafting board ever built without in the least manner producing any measurable difference between the length of the arc and its graphical rectification. Is that close enough?

FIGURE 122, Diagram "5":

Once upon a time the author discovered the fact that the fraction 95/61 represents the trigonometrical tangent of 180 degrees divided by "\( \pi \)" to within \( 1/200 \)th of an angular degree. Hence, this affords a ready and an exceedingly precise method of graphically converting angular to circular measure; for an angle of 180 degrees divided by "\( \pi \)" is the angle subtended by an arc equal in length to its own radius. Such an arc is termed a \textit{radius}. It is the unit of circular measure—a curvilinear unit of length—in distinction to angular measurement in degrees. There are "\( \pi \)" radians in a half circumference. To lay off a radian, graphically, is the simplest thing imaginable: make \( JK \) equal \( 5^\prime-1^\prime \), and make \( KL \), perpendicular thereto, equal \( 7^\prime-11^\prime \), at any scale whatsoever; then the arc \( MN \), drawn from center \( K \)—or any other arc \( PQ \) drawn from the same center—is equal in length to its own radius, to such a high degree of exactitude that the theoretical difference would not become measurable until the radius of the arc amounted to \( 47^\prime-0^\prime \) actual length. Is that close enough? Well, here's one that's \textit{exact}, and if you are gifted with analytic acumen, you'll know why: the triangle \( JMR \) is equal in area to the radian-sector \( JMN \); the square, \( JSTU \), is also equal in area to the same radian-sector; the square \( JMRT \), or any other square whose sides equal the radius of a circle, is equal in area to the area of the circle divided by "\( \pi \)"—exactly so.

FIGURE 122, Diagram "6":

Construct a right angle of which \( DA \) and \( DA' \) are each equal to any circle's diameter. Cross \( DA' \) at \( E \) with a line from \( A \) having a rise, \( AB \), of \( 1-7^\prime \) in a run, \( 13^\prime-11^\prime \). Then \( EA' \) is the side of the "squared" circle to within less than \( 1/50 \)th of an inch per mile diameter. And here's another one that'll not only square the circle but that will also circle the square: draw any line \( DG \) having a slope of \( 148^\circ 167^\prime \) relative to another line \( DF \), that is, make \( DF \) equal \( 13^\prime-11^\prime \) at any scale you choose, and make \( FG \), perpendicular thereto, equal \( 12^\prime-4^\prime \) at the same scale; then if \( DA' \) is the diameter of a circle, \( A'H \) is the side of an equal square; or if \( FH \) is the side of a square, and this be projected to the position \( A'H \), then \( A'D \) is the diameter of an equal circle—each to the same degree of theoretical exactitude as before. Is that close enough? Most certainly it is—for any work performable on any drafting board that could be gotten through the doorway of a drafting room peopled by giants! But now I shall keep my promise heretofore made. I'm going to show you the most exact Euclidean construction for "squaring the circle" that has ever been put on record. It's due to the author's discovery of the fact that if the fraction, \( 9/20 \)ths, be added to the cosine of 15 degrees, and this sum be divided by 10, and the result subtracted from the "in-
in "pi," the difference will be zero up to the eighth decimal place. This is the one I mentioned a while ago—the one that will put the quietus on the "circle squarers" for a score of centuries hence—or plunge them further into madness! This is it:

**FIGURE 122, Diagram "7":**

Freese's quadrature of the circle. Draw $AE$, the radius of the circle, at an angle of 15 degrees to any prolonged diametral line $GJ$. Project $E$ to $C$, perpendicular to $GJ$, and make $CD$ equal $9/20$ths of $AE$. Then cut off $1/20$th of $AD$, locating $B$, and make $BF$ and $AG$ each equal $AE$. From $G$ as a center, revolve $F$ to cross a perpendicular from $B$ at the point $H$. Then $BH$ is one side of the "squared" circle to within about $1/50000000$th part of the radius. This is not a misprint: the deviation is about one fifty-millionth part of $AE$, that is, if $AE$ were 100 miles, then $BH$ would be short by about an eighth of an inch. Is that close enough? The same result comes from revolving $G$ to $K$ from center $F$: $AK$ equals $BH$. Now make $FJ$ equal $FA$. Then $GJ$ is half the circumference of the circle to within about $7/100000000$ths of the radius. Now let the radius $AE$ equal unity. Then $GJ$ and $BH$, respectively, are each the most accurate rectilinear values of "pi" and its square root that have ever been constructed. Moreover, the results can be proved, without recourse to trigonometry, by the purely arithmetical formula which I have seen fit to record along with this construction. Now I can proceed with things more worth while!

**FIGURE 123, Diagrams "1," "2," and "3":**

In Diagram "1," the quadrant arc $YN$ is unbent to the straight line $YJ$ by the method that has already been shown (Figure 122, Diagram "3"), and the arc $YH'$, being less than a quadrant, is developed into the continued portion $YH$ in accordance with the method also before shown (Figure 122, Diagram "4"): the total straight line $1H$ thus becoming the graphical development of the given arc $NYH'$. In a similar manner, as shown in Diagrams "2" and "3," the combination will yield the development of any portion whatsoever of a circumference. And with an utterly astounding degree of exactitude—as is evidenced by the exceedingly minute variation in the minimum and maximum graphical pi-values noted in the Figure. The location of point $A$ varies in accordance with the number of full quadrants contained in the given arc, but the slope of $AC$ is invariable, as has herefore been shown. The point $H'$ correspond to the point $C$ of Figure 122, Diagram "4," but the method of laying off the points that locate $H$ is slightly different from that before given, though the results are identical. To locate $H$, as per Diagrams "1," "2," and "3" of Figure 123, proceed as follows: make $MH'$ equal twice the radius of the given arc; make $H'E$ any distance, but preferably one directly divisible by 31; make $EF$ equal twice $H'E$; and make $ED$ equal $3/31$ of $EF$ or, which is the same thing, $6/31$ of $H'E$; draw $EG$ parallel with $AB$, and locate $G$ thereon with radius $DF$ as shown; then the line $GH'$ fixes the limit of the rectilinear development at point $H$ as shown. Actually, this construction is as
FIGURE 124, Diagrams “4” and “5”:

Lay off, as at Diagram “4,” ab equal to the length of any arc whatsoever up to and including a full circumference. Perpendicular to this, lay off ad equal to the radius of the arc. Bisect both lines at e and c, respectively. Then the rectangles ade and acbd are each equal in area to the corresponding sector of the circle, and the triangle abd is of the same area. Or, as at Diagram “5,” lay off ad equal to the radius, and dh equal to half the length of the arc. Bisect ah at k, and, from this point, wherever it may fall, revolve the point a to cross a perpendicular from d at point i. Then the square dimn is equal in area to the corresponding sector of the circle of which ad is its radius and dh is half the length of its arc. So there you are—every conceivable arc has been unbent into a straight line—every conceivable sector of a circle has been “triangled,” “rectangled,” and “SQUARED.” Now for graphical curvilinear division:

FIGURE 124, Diagram “1”:

Let AB be a circular arc subtending any angle, AEB, not over 60 degrees. Bisect it, and make FG, on the bisector, equal 59/60ths of the radius—which latter operation is quickly done in the graphical manner diagrammed. Project lines from G through the limiting points A and B of the given arc. Anywhere across these two converging lines, draw a straight line CD perpendicular to the bisector of the arc. Divide this straight line in any manner you choose—into equal, unequal, proportionate, or perspective-diminishing, parts. (See Part 11.) Project the resultant division-points onto the arc by lines to G as shown. The arc AB then becomes divided in the same ratio as the straight line CD; no graphical deviation from any one true division-point becoming detectable on any arc up to a full size radius of 6'-0". Moreover, no accumulation of error is possible. Now suppose B'AB to be an arc exceeding 60 degrees but not exceeding twice sixty. Suppose further that you desire to divide it into, say, 7 equal parts. Just divide half of it, that is, BA, into 3½ parts by the method just shown, resulting in the division-points H, J, and K. Then, about A as a center, revolve these to the other half of the arc at H', J', and K'. The most accurate and expeditious way, however, of transferring points from one half of an arc to the other half—especially so if the points are multitudinous, as in a detailed arch ring for instance—is as follows: Over the arc BA, lay a piece of tracing paper or linen, and indent therein the points B, H, J, and K. Then revolve the tracing about the center of the arc so as to bring B into registry with K, or K into registry with B', and so as to cause the other indented points of the tracing to align with the arc beneath. Then transfer the points directly to the arc by indentation through the tracing-points.

FIGURE 124, Diagram “2”:

Same as Diagram “1,” but especially suitable either to arcs of large radius where point G of Diagram “1” would not come within the limits of the drafting board or in cases where the arc center itself is off the board. As before, AB is any given arc up to 60 degrees. Bisect it. Draw the chord AB and any other paralleling line CD. On a radial through either limiting
point of the arc, say point B, lay off BE' equal to 5'-0" at any scale convenient, and lay off E'G', perpendicular to AB, equal to 9'-11" at the same scale. Connect B and G', thus locating D. Make C'C equal C'D. Now divide the two lines AB and CD each in the same manner as you desire the arc to be divided. A straightedge aligned with the corresponding division-points of the two straight lines will cross the arc at the points desired. Like the method of Diagram "1," the limit of graphically-precise division is reached at an angle of about 60 degrees on an arc of six feet radius. To find this limiting angle on an arc whose center is off the board, do this: make NP, on any line perpendicular to the bisector of the angle, equal half the known radius of the arc; then, parallel with the bisector of the angle, project the point P to the arc at A. Then AA' is an arc of 30 degrees, and a repetition of the process on the other side of the center line will yield the other limiting 30-degree point B; or, same thing, revolve A to B from center A'. In other words, you merely find a chord equal in length to the radius; for the arc of such a chord subtends an angle of 60 degrees. It can be found directly, if one limiting point, say A, is established, by using this point as a center from which to swing an arc of a radius equal to the radius of the circle, cutting the arc at B—60 degrees from A.

FIGURE 124, Diagram "3":
Let AB be any arc not exceeding a full quarter circle. Bisect it, and make EN, on the prolonged bisector, equal twice the radius. Draw a prolonged tangent, CD, through the bisection-point of the arc, and draw PNP' parallel with this tangent, making NP and NP' each equal half the radius of the given arc. From P and P', as centers, draw the short arcs Q and Q' as shown. Project A to C, via a tangent to Q, and project B to D, via a tangent to Q'. Now divide the thus-limited tangent line CD in any manner you choose, and project the resultant points to the arc AB via tangent rays to Q or Q', whichever of the latter two curves happens to be on that particular side of the bisector of the angle. The circular arc AB then becomes graphically divided in the same ratio as the straight tangent CD; no measurable deviation from any one true point of division occurring on any arc up to a full 90 degrees or for any radius up to four feet. If the given angle exceeds a right angle, but does not exceed 180 degrees, then divide half the given arc into half the required total divisions, and transfer the thus-found points to the other half either with the compass revolving about the bisection-point of the full arc, or with a piece of tracing linen revolving about the center E of the arc—both methods having been noted in connection with Diagram "1."

In some such expeditious fashion, the full semicircle of Diagram "3" has been divided into seven equal parts with a degree of precision unapproachable by any other known method. That old-old primitive "stepping it off" system of trial-and-tribulation is hereby "backed off the boards"—once you get the hang of these new methods illustrated by the various diagrams of Figure 124—and 125—and 126.

FIGURE 125:
This is a marvel. And it's all done with the T-square, a 45-degree triangle and a drafting-scale. It'll bend a straight line 'round a circle, unwind a circular arc into a straight line, and divide arcs and angles with almost uncanny facility and precision. The combination, however, requires some room. But this

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is fortunate rather than otherwise, since this condition makes it self-limiting to arcs and circles not exceeding a full size radius of about 16 inches. Up to this maximum radius, all operations indicated are graphically precise, and all then come within the working range of a 48-inch T-square. Let $EA$ be the radius and the normal horizontal spring line of any given circular arc. Locate $N$ on a 45-degree line through $E$, distant two radii from $E$. Also draw the short arcs $Q$ and $Q'$, with a radius equal to half of $EA$, and with centers on a 45-degree line through $N$. Then draw the prolonged 45-degree tangent through $M$, and project $A$ to $C$; and $U$ (the 90-degree point in respect to $A$) to $V$, by tangent rays emanating from the corresponding arcs $Q$ and $Q'$. This projection does not require the drawing of any lines at all—in fact it should be done with one point of the dividers instead of with the pencil point. For instance: place the divider-point at $A$, swing the straightedge into touch, then swing it into tangency, “by eye” in this case, with $Q$, then indent $C$ — the required point. The process is typical. Now you are all set to put this combination to work. First you may want to lay off a certain distance—any distance—in feet and inches, along the line of this arc from the spring point $A$. Make this distance $CD$ on the tangent as shown. Project $D$ to $B$ via a tangent ray to $Q$. Then $AB$ is the required distance, bent to the radius $EA$. Or, let the given distance be $CX'$. Project $X'$ to $W'$, via a tangent ray to $Q'$. Then $AW'$ is the required distance on the arc. Again, let the given distance be $CX$, which puts it beyond the 90-degree development-point, $V$, by the excess $VX$. Revolve this excess about $V$ to $VX'$. Project $X'$ to the arc in the manner now plain. Then the arc-measure of $VX$ is $UW'$. Hence revolve $W'$, about $U$ as a center, to point $W$. Then $AW$ is the distance $CX$ bent to the curve of the given arc. Now, it is plain to be seen, that any portion of the given arc can be "stretched out" to a straight line on the 45-degree tangent $CX$ by an exact reversal of any one of the above operations—this second case requiring no further elucidation. So comes division—the third case of this astonishingly-workable "three-in-one" combination. Take the arc $AB$, for example. Find the stretch-out of it as in case 2, which is $CD$. Divide this portion of the 45-degree tangent in any manner you desire. Project the division-points to the arc, which latter then becomes divided in like manner—the linear divisions on $CD$ accommodatingly bending into corresponding lengths on $AB$. In the same manner, the arc $AB'$ is in the process of being divided into 17 equal parts corresponding to the 17 like parts of the developed tangent $CD'$. Likewise, any portion of any arc can be cut off in a given ratio. In the Diagram, $B'Z'$ is $1/12$th of the arc $B'B$; the arc $BZ$...
is 1/5th of the arc BA; etc., etc. Also, the angle $AEB$ is to the angle $AEB'$ as the straight line $CD$ is to the straight line $CD'$. Well, as I have said, this combination is a marvel—within the limits prescribed. Finally, for arcs of the maximum limiting radius, or thereabouts, that are to be divided into an exceedingly large number of small parts, it is a simple matter to cut a small arc, $Q$ or $Q'$, from thin cardboard and thumb-tack this to the board alternately on one side of $N$ and the other, in proper position, against which the blade of the T-square or other straightedge will automatically produce the tangent lines of projection required. This useful expedient is, of course, applicable to the substantially same method of division shown at Diagram "3" of Figure 124: the only difference in the two methods of division being that, in Figure 124, the rectification of the arc takes place on a tangent drawn perpendicular to the bisector of the given angle, whereas, in the combination of Figure 125, the rectifying tangent is invariably drawn at 45 degrees, regardless of the extent of the given angle. Incidentally, for the purpose of division only, the latter method remains "graphically precise" for any arc of a quadrant not exceeding a radius of 3'-8" actual measurement: the maximum "non detectable" deviation of 1/200th of an inch occurring at about an angle of 7 1/2 degrees for all arcs of the maximum radius stated.

**FIGURE 126, Diagram "1":**

The line $BCDE$ is a compound curve with a straight

haunch $DE$. Let's see what we can do with it. First, stretch out the arc $BC$ whose center is $A$. The stretch-out is $B'C''$ on the tangent drawn perpendicular to the bisector of the angle. You know how to do it. Next, develop the other arc $CD$. Add this development, which is $C'D'$, to the tangent $B'C''$, thus making the total stretch-out of the two arcs $B'D''$. Now, from the point $D''$, add the length of the straight haunch $DE$ which there becomes $D'E'$. Then $B'E'$ is the graphical development of $BCDE$. Now, we'll say, let $B'E'$ represent any distance that you wish to lay off from $B$ on the compound haunched curve: or let $E'A'$ be any such distance that must be laid off from $E$. The problem is: to locate point $A'$ on the arc. Simply transfer the distance $D'E'$ to $D'A'$, and then project $A'$ onto the curve $CD$ in the manner with which you should certainly now be familiar. That's all there is to that problem! But maybe this haunched curve is half the intrados, say, of a three-centered arch which you desire to divide in some manner—say into five equal parts. Here, then, is a case that could not even be handled by the aboriginal "stepping off" system, since a straight line forms a portion of the line to be divided. And in order to do it mathematically, you'd first have to figure the length of the arcs; but in order to figure the lengths of the arcs, you'd have to figure the angles made by their limiting radii; and after you'd figured the arc lengths from the figured angles, and summed up the various increments making

[31]
up the total line, then you'd divide this by five, and
then start figuring out a way to figure each figured
fifth part of the figured line back into place; but by
that time you'd have figured yourself into such a deci-
mated array of trigonometry that you'd probably fig-
ure you didn't like being a figurehead anyhow—and
quit. So here's how to divide that crooked line without figuring: Just divide its graphical development
B'E' in the manner desired, then project the resultant
points onto the given mixed line. Points 1 and 2 are
projected directly as shown, since they come within
the limits of B'C'', but points 3 and 4, occurring be-
tween the limits of C''D'', must first be transferred to
their corresponding developed tangent C'D' in exactly
the same relative positions—which is easily and accu-
dately done with a paper strip—and, from these latter
positions, points 3 and 4 are then projected onto the
curve. And the only figuring you've done is to figure
yourself out of a job. But here's another one:

FIGURE 126, Diagram "3":
Here, it is required to bisect the unsymmetrical
mixed line BCD'E. First cut the line down by sub-
tracting, directly, the shorter straight length BC from
each end of the total line, which leaves the portion
CDG. Now, it is evident that, since EG equals BC,
the mid-point of the reduced portion will be the mid-
point of the total line. Hence, develop the arc CD
to the tangent C'D'; add thereto, by transference,
the straight distance YG' equal to DG; bisect C'G' at F';
project F' onto the arc at F—or at whatever point it may fall—which point then becomes the re-
quired center-point of the mixed line BCD'E. If the
total line BCD'E had been stretched out and bisected,
the result would have been identical: the prior reduc-
tion of the original line was an expedient which, how-
ever, applies to bisection only. You can readily see
that, to divide the total line BCD'E into any number
of parts except two equal ones, then the entire line
would have to be straightened out into the tangent
line B'E', and the division performed on said rectify-
ing line before projecting, or otherwise transferring,
the results to the original mixed line.

FIGURE 127:
Let D be any point on a given circular arc; and let
C be any other point on the arc occurring within the
same quadrant. How far is it from C to D, along
the line of the arc, in feet-and-inches? First, draw
the prolonged tangent CF on which the given bent
line is to be straightened out—so that you can there
measure it or transfer it to any other portion of the
drawing. Next, bisect the given arc CD at point E,
at the same operation producing the required radial
through E. As you already know from the informa-
tion given in Parts 7 and 8, the projection of tangents
and radials does not necessitate the use of the center
from which the arc is swung. So, as noted on the
illustration, the methods here given are particularly
applicable to arcs of large radii—in full-size detailing
for instance. Anyhow, on the prolonged radial drawn
through E, make EG any distance whatsoever, but
preferably one that can be directly scale-divided by 31.
Then make GH equal twice this distance; and make
GK equal 3/31sts of GH. You can readily do this
with the decimal scale, but it can just as quickly be
done with an architectural scale as follows: Lay off
EG equal to 2'-7"; GH equal to 5'-2"; and GK

revolving them onto the quadrants, as has heretofore
been made clear in Figure 125. Wherefore, on the
initial 45-degree tangent line B'C'', the direct develop-
ment of the 90-degree arc, BC, is B'C'; and the re-
olved development of the arc CD is C'D'; and the
transferred length of the straight portion, DE, is
D'E'; and the transferred development of the arc
EFG is E"G". Now you can lay off any distance
you please on this grapevine, or divide it in any manner
required, by first laying off the divisions on B'G" and
then, by a virtual reversal of the process of rectifica-
tion just suggested, project or transfer them to their
places on the line BCD'E. Quartering is shown in
the Diagram, but it is fully suggestive of the typical
process.

FIGURE 126, Diagram "2":
To lay off an arc of a given length which shall subtend a given angle. Or to find the required radius of the arc.

AB = given length of arc
BJ = twice an ax-fair with E
KZ = 2"-50, B,A.D.

This construction like that of
FIGURE 4, FIGURE 126, is graphically precise for all arcs of a quadrant up to a radius of 13'-3" actual length.

FIGURE 128

Pencil Points for January, 1931
equal to 6", at any handy scale. The distances are merely proportions: not actual measurements. So, now, draw $GL$ perpendicular to $CF$, and find $L$ with radius $KH$ as shown. Cross $CF$ at $E'$ with the projected line $EL$. Then $CE'$ is the rectification of the arc $CE$. Wherefore, twice $CE'$, which is $CF$, is the straightened-out given arc distance $CD$.

Again, in Figure 127, let $CF$ represent a given distance which must be laid off, from point $C$, on the given line of the circular quadrant. Make $CE'$ equal half this distance—it being unnecessary, therefore, to first lay off the total distance $CF$: the latter being shown merely to make the process graphically understandable and unmistakable. From $E'$, draw the prolonged radial $E'h$, and also draw $E'g'$ perpendicular to $CE'$. Lay off $E'g'$ equal to $2'-7"$, at any scale convenient; and, from $g'$, project a line parallelizing $E'C$ to cross the radial at $g$. Then, at the same scale as $E'g'$, lay off $gh$ equal to $5'-2"$; and $gh$ equal to 6". Draw $gl$ perpendicular to $CE'$, which direction must be parallel with $E'g'$, locating $l$ with radius $kh$ as indicated. Now, a straightedge joining $l$ and $E'$ will cross the given line of the arc at $E$; whence, the circular distance, $CE$, is the straight length $CE'$ bent to the radius of the arc; whence, twice the arc $CE$, which is the arc $CED$, is the given distance $CF$ laid off on the given circular line of the quadrant.

The above-given combined method of rectification and laying-off—of circular-distances is practically exact for any such layout that can be performed within the limits of the drafting—ROOM—as the given tabulated limits indicate. As this table shows, the greatest possible deviation from true rectification occurs in the case of arcs subtending the critical angle of about 75 degrees: and yet, for this critical angle, and for a full size actual radius of 13'-3", the total deviation from the true length of the full 75-degree arc is an unmeasurable .005ths of one inch. On an arc of 45 degrees, it would require a full size radius of 74'-2" to produce the same theoretical discrepancy. No general method of rectification and laying-off has before been devised that equals this method in simplicity, speed or exactitude. You have, no doubt, discovered the fact that it is the same layout, slightly modified, which has heretofore been recorded at Diagram "4" of Figure 122, and has also been combined in the first three layouts of Figure 123. And now comes another embodiment of the same noteworthy fundamental construction:

FIGURE 128:

In either Diagram, let $LBM$ be any given angle up to a full 90 degrees, across which, and limited thereby, it is found necessary to draw a circular arc which shall be of a specified length in feet-and-inches. To put it another way: the length of the arc, and the angle to be subtended by the arc, are given; it is required to determine the radius of the arc. Let the given length of the arc be laid off, in a straight line, as $BA$; $B$ being the vertex of the given angle $MBA$. Bisect this angle with the prolonged bisector $BC$, making $BC$ equal to $BA$, as shown. With the 37-mark of any convenient scale at point $C$, mark off, along the center line of the angle, the proportionate distances indicated on the depicted scale. Or you can do this in the manner just previously shown in Figure 127: calling point $E$, of Figure 127, point $C$ of Figure 128. Then, as in Figure 128, draw $6G$ parallel with $BA$; and find point $G$ with radius 0-56 as shown. Now, from $A$, perpendicular to $AB$, project a line to cross $GC$ at point $H$. Make $BJ$ equal twice $AH$. Then, as at
Diagram "1," project $A$ to $K$, in a direction parallel­
ing $JC$. Or, as at Diagram "2," if this direction makes a too acute angle for accurate and definite inter­section at $K$, then just double or triple both $BJ$ and $BA$, thus determining the still-properly-related points $A'$ and $J'$; then project $A'$ to $K$ in a direction parallel­
ing $J'C$. Whence, in either case, $BK$ becomes the result­ing required radius. So the then-drawn arc $LKM$, sub­tending the given angle, is the curvilinear equiva­lent of its rectilinear representation $BA$—subject to the limiting conditions stated in the Figure, which, as far as practical drafting is concerned, are no lim­i­tations at all.

**FIGURE 129:**
In either Diagram, call $AB$ a given arc of radius $EA$; and assume the necessity of laying off the length of this arc on another circular line of a differing radius $EA'$. In accordance with the method heretofore given at Figure 125, develop the arc $AB$ into the rectifying 45-degree tangent $CD$, as here shown. Then, as at Diagram "1," on any suitable line not paralleling $CD$, make $CF$ equal $EA$; and make $CH$ equal $EA'$, which latter makes $CH$ equal $AA'$. Project $J$ to $H$, in a di­rection paralleling $KD$, and project $H$ to $J$ via a tan­gent line to $C'$. Project $J$ to $B'$ by a radial from $E$.

Then the resultant arc $A'B'$ is the other arc $AB$ bent to the radius $EA'$ as required. Or, as at Diagram "2," make $C_I$, in any suitable direction other than parallel with $CD$, equal to $EA$; and make $D_I$, in a direction paralleling $J'C$, equal to $AA'$. The line $f$ now becomes the 90-degree limit $L$, which latter does not sub­ordinate required radius. So the then-drawn arc $LKM$ is the curvilinear equivalent of the given arc $AB$. But maybe the given arc is $A'B'$—the larger in radius. Then, referring to Diagram "1," reverse the above alchemy as follows: Draw an extended arc with the lesser radius from the same center $E$; project $B'$ radially to $J$ on this prolonged arc-line of radius $EA$; develop the resultant arc $AI$ into the portion, $CH$, of the 45-degree tangent drawn through the 45-degree point $M$; and lay off $C_I$ and $C_E$ as before. Now project $J$ to $D$, in a direction paralleling $H$, and estab­lish the 90-degree limit $V$ of the development along $CD$ as indicated. Make $V'D'$ equal $VD$; project $D'$ to $L$ by a line tangent to $O$; and make $UB$ equal $UL$ as shown. Hence, $AB$ is the required arc-length equivalent to the given arc-length $A'B'$—or so closely such that you would have a terribly involved time trying to figure it otherwise! The reversal of the transformation for the case shown at Diagram "1" is more simple, and obvious—since neither of the arcs exceed an angle of 90 degrees.

**FIGURE 130:**
Here, two methods are shown for taking any frac­tional part of a circle, or an arc, or an angle. This is often convenient in full-size detailing, etc., where the curvilinear extent of but one repeating unit is required. Obviously, it is also applicable to the finding of the length of one side of any regular polygon. Both methods produce identical results, and both are founded on the basic construction given at Diagrams "1" and "2" in Figure 124.

At Diagram "1," let it be required to cut off, say, 12/17ths of the arc $AB$, which latter does not sub­tend an angle greater than 30 degrees. Draw $BD$ at right angles to $CA$; and make $DE$ equal 12/17ths of this straight line, or, which is the same thing, make $BE$ equal 5/17ths of the same line. Through $E$, draw the radial $EG$ and the perpendicular $EF$, making $EF$ equal 5'-0" at any handy scale, and locating $G$ by a line projected from $F$ in a direction paralleling $AE$. Then, at the same scale as $EF$, and paralleling $EF$, make $GH$ equal 9'-11". A straightedge aligned with $H$ and $E$ will cross the given arc $AB$ at $J$, thus slicing off the portion $AI$ equalling 12/17ths of $AB$, as required—no graphically-detectable discrepancy occurring for any radius, $CD$, up to a full six feet in
actual length. Now assume that the arc $AM$ exceeds 30 degrees, but does not exceed twice 30; and that it is bisected at point $B$. Then, by revolving $A$ about $J$ to $K$, the arc $AK$ becomes $12/17$ths of the last-given arc $AM$. Again, let it be required to take, say, $22/51$sts of the quadrant arc $AL$. Well, $22/51$sts of a quadrant is $22/17$ths of a 30-degree arc; and $22/17$ths of a 30-degree arc is $30$ degrees, plus $5/17$ths of itself. Wherefore—since $BJ$ has been found by taking $5/17$ths of the now-assumed 30-degree arc $BA$—revolve $J$ about $B$ to $N$, which simple manipulation makes the arc $AN$ equal to $22/51$sts of the quadrant arc $AL$, as required. Finally, as an absolutely general case, let it be necessary to lay off, say, $1/17$th of a full circumference, which portion naturally, is bound to be the same fractional part of 360 degrees. The radius $CA$ is given, or assumed; the center, $C$, being on the board or off—it's of no consequence. Now, it is certainly a very rudimentary "mathematical" process to deduce the fact that $1/17$th of a circle, or any other fractional part of a circle, is just $12$ times that particular fractional part of a 30-degree arc. In other words, it is extemporaneously-arrived-at that the required $1/17$th of a circle is $12/17$ths of a 30-degree arc or angle. The rest is just as—extemporaneously-arrived-at: locate the 30-degree point, $B$; take a dozen seventeenths of the thus-limited arc $AB$, and it will be $AJ$, the required one seventeenth of a circle having the given radius $CA$. And if you joined $A$ and $J$ by a straight line, then this straight line would be one side of a—hep—hep—heptadecagon. So, you see, by using the 30-degree arc as a gauge, you can quickly and accurately materialize any piece of "pi" you crave.

The method of "slicing" shown at Diagram "2," of Figure 130, is particularly suitable to very small fractional parts, and may, on occasion, prove more expeditious and more precise in execution than the method of Diagram "1." In the case depicted at Diagram "2"—which is typical of the general process—it is required to take $1/11$th of the quadrant arc $AL$. It is, of course, unnecessary to draw the entire quadrant for this purpose: it is necessary to draw only the 30-degree extent of same, which is here assumed as the arc $AB$. Well, $1/11$th of 90 degrees is assuredly $3/11$ths of 30 degrees. Hence, from the 30-degree point $B$, draw $BD$ at right angles to $CA$, and draw the radial $BP$. Then, at any handy scale, locate the point $P$ at a distance of $5'-0"$ from $B$, and locate $Q$, in a direction at right angles to $BD$, at a distance of $9'-11"$ from the point $P$. If you'd rather, you can use the decimal scale, and call these same distances 60 and 119, respectively. Now draw $QB$ and $BD'$, the latter being any line paralleling $BD$ and limited as shown. Make $DR$ equal $3/11$ths of $DB$; and make $D'R'$ the same fractional part of $D'B'$. This establishes the slope of the slicing-line $R'R$; thus cutting off the arc $AB$ which, because it is $3/11$ths of the 30-degree arc $AB$, is the required $1/11$th of the quadrant arc $AL$. Of course, if the total arc to be subjected to any of the aforementioned surgical operations does not, in itself, exceed 30 degrees, then the slicing can be done without magnification of the given fraction: that is, if the arc $AB$, say, were an arc of less than 30 degrees—any amount less, regardless of its particular angular designation—merely draw the line $BD$, perpendicular to $CA$, through the limiting arc-point $B$, and proceed as before, dividing $BD$ and $B'D'$ each in the identical manner required for the given arc. FIGURE 131:

The secret of the circle—at last!

Let the arc $AMNB$ be any portion of a semicircle, of any radius $OA$. Draw the prolonged line $AP$, perpendicular to $OA$. On $AB$, as a base, construct a right-angled triangle, $ABC$, whose hypotenuse, $AC$, bisects the angle between its base and the line $AP$. On the resultant hypotenuse, as a new base, construct another right-angled triangle whose hypotenuse also bisects the angle between its base and the line $AP$. Continue this kindergarten pastime—that is, just keep right on doing it—until the irregular outline $BCDE$, etc., etc., of the figure you are building, meets the perpendicular $AP$ at $X$. Simple—isn't it? And when you have accomplished this, then will $AX$ be the exact length of the arc $AMNB$. And if this arc were a full semicircle of unit radius, then $AX$ would be "pi"—exactly so! No doubt, this simple construction will remain eternally famous. Try it and see.

In Part 15, applied cyclometry goes on the boards.
DOORWAY IN WALL OF COURTYARD
MORLAIX - BRITTANY
MEASURED & DRAWN BY TRENT ELWOOD SANFORD - 1929.

FROM A MEASURED DRAWING BY TRENT ELWOOD SANFORD
RENAISSANCE ARCHITECTURE AND ORNAMENT IN SPAIN
A PLATE FROM THE WORK BY ANDREW N. PRENTICE
PENCIL POINTS FOR JANUARY, 1931
VOLUME XII  NUMBER 1

"This palace contains a magnificent suite of five apartments, the ceilings of which, said to be designed by Berruguete, are the subject of this plate. The work is in a splendid state of preservation; the height is about eighteen feet from the floor and the material is dark walnut. The carvings display much variety of design and detail, and are amongst the purest of their kind in Spain. Several of the rooms are enriched with deep ornamental plaster friezes, placed below the wooden carved frieze."

A. N. PRENTICE.
FROM A DRYPOINT BY CHESLEY BONESTELL

"NUMBER ONE WALL STREET"

PENCIL POINTS
This recent drypoint by Chesley Bonestell shows the Irving Trust Company's new building at 1 Wall Street, New York, as seen from the churchyard of Trinity. As everyone knows, the architects for the new building were Voorhees, Gmelin, and Walker. The original print measures 7" x 13".
BRONX SOLDIERS' MEMORIAL, PELHAM BAY PARK, NEW YORK—JOHN J. SHERIDAN, ARCHITECT
FROM A RENDERING IN OIL COLOR BY CHESLEY BONESTELL

PENCIL POINTS
(January, 1931)
PENCIL POINTS SERIES
of
COLOR PLATES

The rendering of the war memorial shown on this plate was executed on a fine grain absorbent canvas similar to shade cloth. After the drawing was laid out in pencil the masses were laid in with water color which gave a texture visible in the road and grass and in the trees of the background. Thin glazes of oil were then used to heighten the color and even the tone. The sky was painted in with pure oil paint. The original measures about 30" x 20".
FROM A LITHOGRAPH BY FRANK SCHWARZ
A VIEW OF ANTICOLI-CORRADO FROM THE ADJACENT HEIGHTS

PENCIL POINTS
This print is one of a series of lithographs recently drawn on stone by the artist from sketches made in 1927 during his residence in Anticoli-Corrado, near Subiaco, Italy, as holder of a Guggenheim Fellowship. The original measured 18\(\frac{3}{4}\)" x 12".
The sketch shown on this plate was done by Francis S. Swales while he was living in England in 1906. An article on Mr. Swales' work appeared in the September, 1930, issue of Pencil Points.
PENCIL POINTS FOR JANUARY, 1931

FROM A PENCIL RENDERING BY JOSEPH MccOY

HOUSE FOR RODNEY S. JARVIS, ESQ., GREAT BARRINGTON, MASSACHUSETTS—E. DEAN PARMELEE, ARCHITECT
FROM SKETCHES MADE ON THE SPOT AT THE CALIFORNIA MISSION PLAY
MR. KAMPS MADE HUNDREDS OF NOTES SUCH AS THESE, MOST OF THEM IN COLOR
Some Notes on the Mission Play

By Norman H. Kamps

The California Missions were rapidly falling into decline when, for the benefit of those who loved the past, as a child its parent, there was conceived an author playwright. That man was John Stephen McGroarty, creator of the Mission Play, which is the story of the early California, land of Dons and Senoritas and the home of one of the happiest cultures the world has ever known.

The Mission Play is an annual event and runs for a lengthy season each year. It has been presented over 3,000 times and is a success in every way, including financially. It is housed in its own typically Spanish Theatre at San Gabriel. In one of the patios may be seen small replicas of all the California Missions. The proceeds of the play are devoted to the preservation of the Missions and a proud son thus pays homage to his Mother.

The time is at hand for architects to design theatres for historic plays for every State in the Union—theatres that will spring from their very environment with kinship to the soil and climate on which they grow. The plays will reenact the pioneer days, with home talent. The southland will create a new and greater Uncle Tom's Cabin and the architectural motif of the theatre will be cotton and slavery and the music and song will be the negro spirituals. Wisconsin will build her theatre with an uncut forest as the motif. The characters will be lumberjacks, Indians, Father Marquette—and the songs will be derived from the winter winds and the silence of the maple sap in springtime and from the breaking of ice from the storm-tossed land of lakes. Genius will capture the voice of nature and the spirit and breath of the early settlers and then release them in a poem, a song, and a book, and a play, and a theatre.

Somewhere between Atlanta and the sea is created, in the mind's eye, a theatre which will teach history to young and old in the form of a great annual Civil War Drama. Each State will have its playhouse for historic plays and we will hold communion with the past and man's continuity will not be lost. Archaeologists are concerning themselves with linking the far yesterday to today; they are patching up what was sometimes ruthlessly destroyed. Their fine minds are busy establishing what might already exist, namely the secret of the buried ages gone by. They are repairing breaks in the rear of the column of life, but they belong at the head of the column of life's endeavors.

History will furnish us the themes for the localized historic plays and past history must frequently rely on archaeology for facts.

What John Stephen McGroarty has done for California will be done for other parts of the country and the tourist will be enabled to see plays and hear stories of the past in the splendid way that is possible at the San Gabriel Mission Playhouse where he may become familiar with the very essence of California history in the space of just a few hours.
NOTES ON THE CALIFORNIA MISSION PLAY FROM THE SKETCHBOOK OF NORMAN H. KAMPS
SEE COLOR PLATE IN THIS ISSUE FOR A COMPOSITION WORKED UP FROM THESE AND SIMILAR SKETCHES
THE MISSION PLAY, SAN GABRIEL, CALIFORNIA
FROM A COLOR STUDY FOR A MURAL DECORATION BY NORMAN KAMPS

PENCIL POINTS
(January, 1931)
This careful study for a mural decoration is based on the famous Mission Play, given annually at the San Gabriel Mission in California. It is one of a series designed by the artist who has made a long study of the play and was worked up from notes taken directly from the play as it was being acted. Elsewhere in this issue will be found reproductions in black and white taken from pages in Mr. Kamp's notebook, together with a short article concerning the play. The drawing shown here measured 12 1/2" x 8 1/2" and was outlined in ink and painted in with clear washes of transparent water color.
Competition for the Worcester Memorial Auditorium
Winning Designs and Report of the Jury of Award

Invitations were extended to twenty-one architects of Worcester, Boston, and New York to submit designs in the competition for the New Municipal Memorial Auditorium for Worcester, Massachusetts. Eighteen architects accepted the invitation. The drawings were judged by a Jury of Award consisting of three architects, Charles D. Maginnis of Boston, F. Ellis Jackson of Providence, and J. Frederick Larson of Hanover, N. H., and two lay members, George F. Booth and George N. Jeppson of Worcester.

The design by Lucius W. Briggs of Worcester, associated with Frederic C. Hirons of New York, won the first place; second place and $1,500 went to J. D. Leland Company of Boston and Worcester; third prize of $1,250 was given to the design submitted by Henry and Richmond of Boston; the fourth prize of $1,000 went to Jasper Rustigian of Worcester, associated with Will Rice Amon of New York. All these four designs are shown herewith. The auditorium is to be erected "as a Memorial to Soldiers, Sailors, and Marines."

The Problem
The chief essentials of the building in the order of their size are as follows:—(a) A Large Auditorium or Hall; (b) A Small Hall; (c) A Memorial Hall or Chamber; (d) Offices, Cloak Rooms, Toilet Rooms, Ticket Rooms, etc.; (e) Corridors and Entrance Halls; (f) Boiler Room, etc.; and (g) Kitchen, etc.

(a) The Auditorium is to be used for concerts, dramatic performances, conventions and school commencement exercises. For these and perhaps for other occasions a wooden sloping floor (to be removable) must be provided. The hall will also be used for pageants, exhibition drills, and so on. For these occasions the permanent level floor will be required and provision for storing the removable floor and the seats attached thereto must be made, probably in a basement directly under the permanent floor, with trap doors in the latter. For purposes of cubing assume this basement floor to be 9'0" below level of permanent floor of auditorium. (Mandatory.)

The auditorium should seat, approximately, 4,000 persons, of which not over forty-five per cent may occupy the balconies, and less if possible. The hall shall not be less than sixty-five feet (65') high from floor to highest portion of ceiling.

(Continued on page 62)
PENCIL POINTS FOR JANUARY, 1931

WORCESTER MUNICIPAL MEMORIAL AUDITORIUM

PERSPECTIVE OF WINNING DESIGN BY LUCIUS W. BRIGGS OF WORCESTER, MASS., ASSOCIATED WITH FREDERIC C. HIRONS OF NEW YORK

COMPETITION FOR WORCESTER MUNICIPAL MEMORIAL AUDITORIUM
PENCIL POINTS FOR JANUARY, 1931

PLANS OF DESIGN BY J. D. LELAND COMPANY OF BOSTON AND WORCESTER

PLANS OF DESIGN BY HENRY AND RICHMOND OF BOSTON
COMPETITION FOR WORCESTER MUNICIPAL MEMORIAL AUDITORIUM
PENCIL POINTS FOR JANUARY, 1931

PERSPECTIVE OF DESIGN PLACED THIRD, BY HENRY AND RICHMOND OF BOSTON

TRANSVERSE SECTION

TRANSVERSE SECTION THROUGH FORECOURT

SECTIONAL SECTION

SECTIONS OF DESIGN PLACED THIRD, BY HENRY AND RICHMOND OF BOSTON

COMPETITION FOR WORCESTER MUNICIPAL MEMORIAL AUDITORIUM

[ 59 ]
WORCESTER MUNICIPAL MEMORIAL AUDITORIUM

Perspective of design placed fourth, by Jasper Rustigian associated with Will Rice Amon

Plans of design placed fourth, by Jasper Rustigian of Worcester associated with Will Rice Amon of New York

Competition for Worcester Municipal Memorial Auditorium
COMPETITION FOR THE WORCESTER MEMORIAL AUDITORIUM

(Continued from page 53)

A large stage 5'0" above auditorium floor is wanted, suitable for orchestral and choral concerts and dramatic performances.

The Owner would like the Auditorium, as the great central feature of the plan, to be a fine hall and of sufficient height to produce a noble proportion; a handsomely panelled and decorated ceiling and a modelled and decorated frame at the proscenium opening.

(b) The small hall shall seat approximately 700 persons on the floor and in one balcony.

A comparatively small stage only is wanted, as it will not be used for dramatic performances, but small ante-rooms must be provided. The floor of this hall may be built as a permanently sloping floor. This small hall should have suitable entrance lobby and vestibule, ticket office, stairs to balcony, proper emergency stairs and exits, cloak rooms, smoking room, toilet rooms, etc. Provide moving picture booth.

(c) The memorial hall or chamber is "to serve as a reverent and enduring tribute to the men and women of Worcester who have served the Republic in War."

It is the hope and belief of the Owner that externally, with the funds available, a handsome and monumental building can be obtained.

The building must be of first-class construction as defined in the Worcester building law or ordinances. (Mandatory.)

The exterior wall surface must be designed to indicate stone finish. (Mandatory.) The Owner hopes that this finish may be of granite, as the assumption of forty-eight cents (48c.) per cubic foot includes the cost of such material.

To sum up. The Owner suggests, in view of the memorial character of the building and the adequate funds at his disposal, that the competitors, while not neglecting or minimizing the utilitarian and practical necessities of the problem, will give paramount consideration to the study of beauty and aesthetics, to be in evidence on the exterior as well as in all the important public portions of the interior. To obtain a work of great architecture for the City of Worcester is the Owner's hope and ambition.

REPORT OF THE JURY OF AWARD

In accordance with the instructions of the program we have strictly respected the anonymity of the competition and have refrained from any effort to identify the competitors. Eighteen designs were submitted for our consideration and these have been numbered by the Professional Advisor and the sealed envelopes containing the names of their authors have been deposited by him pending their opening by your Commission.

After prolonged study of these designs, the Jury has unanimously elected No. 13 [by Lucius Briggs associated with Frederic C. Hiron] as the most worthy and have voted therefore to recommend that its author be appointed as the architect of the new building. The considerations which have influenced this decision are as follows:

(1) The design has a plan of distinguished merit, of direct and logical circulation. A unique merit of this scheme which was not, however, suggested by the program is the extension of this circulation to the outdoors by means of free access to the side doors. Such a feature would lend itself interestingly in the summer to the purposes of pageantry and ceremonies. The Auditorium in its proportions and treatment is of excellent architecture. The relation to it of the Small Hall is admirable, admitting both of combined and independent use as occasion may require. The situation of the Memorial Hall is such as to affect felicitously the exterior as well as the interior of the scheme.

(2) The exterior of the building as illustrated is of distinctly monumental character, expressing clearly the memorial intention. (Continued on page following)
(3) Beyond any designs submitted No. 13 takes account of the physical conditions of the neighborhood, particularly of the presence of the Boys' Club which, from many viewpoints in Lincoln Square, obscures a considerable portion of the Auditorium site. The Jury, it should be stated, was much impressed by the importance of this consideration in determining the availability of a competitive scheme. In the design presented the architectural interest of the façade is confined to such limit of width as to be independent of this intrusion. The plan, moreover, is skilfully contrived to make for attractive appearance to the approach from the north and south.

The Jury has elected No. 6 [J. D. Leland Company] as entitled to the second prize. This design, though distinctly less adapted to its situation and less monumental in expression, has an exterior of notable refinement and the plan admirable simplicity and directness.

It is recommended that the third prize be awarded to No. 5 [by Henry and Richmond]. Here, as in the case of several designs submitted, the Small Hall and the Memorial Chamber have been, not without obvious difficulty, symmetrically opposed in the plan. The author has made very attractive and picturesque use of the arrangement, however, in the development of an otherwise admirable and straightforward scheme.

No. 15 [by Jasper Rustigian associated with Will Rice Amon] has been appointed as the fourth prize. This shows an auditorium of excellent proportions and a well studied arrangement, even if the interesting façade has been achieved at some sacrifice to other interests of the plan as well as to the exterior.

The Jury ventures to suggest to the Commission that so important a condition to the dignified architecture of this neighborhood as the construction of this Auditorium would seem to demand a study of the lines of Lincoln Square which at present is so formless and unattractive. It is also impressed by the necessity of reconsidering the situation of the proposed War Monument with the view of bringing it into a responsible and symbolic relation to the new Auditorium.

Charles D. Maginnis
F. Ellis Jackson
J. Frederick Larson
George F. Booth
George N. Jeppson

Jury of Award

Heights of New York Skyscrapers

Interest in the heights of New York skyscrapers does not seem to abate, if we may judge by the inquiries concerning them received in this office. For the benefit of those who are interested, therefore, we are printing the following list, compiled and published several months ago by The New York Sun.

It should be noted that the heights given include such superstructures as the dirigible mast on top of the Empire State Building or the steel spike which surmounts the Chrysler Building. We will be glad to have any inaccuracies called to our attention. The list follows:

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<td>120 Wall Street</td>
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<td>Bush Terminal Building</td>
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<td>St. Moritz Hotel</td>
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<td>Morris-West St. Building</td>
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<tr>
<td>Hotel Governor Clinton</td>
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THE GOVERNING COMMITTEE of the James Harrison Steedman Memorial Fellowship in Architecture announces the sixth competition for this Fellowship, to be held in the spring of the year 1931.

This Fellowship is founded in memory of James Harrison Steedman, M.E., Washington University—1889, First Lieutenant U. S. Naval Reserves, Assistant Engineer Officer U. S. Oklahoma in 1917 and 1918, who at the age of fifty, suffering from a malady curable only by rest, refused to quit his post and knowingly made the great sacrifice.

The value of this Fellowship is represented by an annual award of Fifteen Hundred Dollars, to assist well qualified architectural graduates to benefit by a year in travel and the study of architecture in foreign countries, as determined by the Committee and under the guidance and control of the School of Architecture of Washington University.

This Fellowship is open on equal terms to all graduates in architecture of recognized architectural schools of the United States. Such candidates must be American citizens of good moral character, and shall have had at least one year of practical work in the office of an architect practicing in St. Louis, Mo., before being entitled to assume the benefits of the Fellowship. All candidates shall be between twenty-one and thirty-one years of age at the time of appointment to this Fellowship.

Application blanks for registration can be obtained at any time upon written request addressed to the head of the School of Architecture of Washington University, St. Louis, Mo., to whom application blanks properly filled out must be returned not later than January 24, 1931. Any requests for supplementary information relative to the rules and regulations governing the Competition shall be made at the same time.

Any candidate who holds a degree not conferred by Washington University must submit with his application a transcript of the record of his scholastic work.

Each application must bear the endorsement of three members of the American Institute of Architects, one of whom at least must be a resident of the City of St. Louis.

BROOKLYN CHAPTER, A.I.A.

THE BROOKLYN CHAPTER of the American Institute of Architects at the November monthly dinner appropriated $100 to aid the unemployed draftsmen through the Architects' Emergency Committee.

Many members told of an unusual number of unemployed at this time and recommended not only that public works be speeded up by the State and City, but that where possible owners should pay particular attention to the improvement of their property during this period of low costs.

Twelve applications were received for consideration in the membership drive to include especially those in the outlying districts of Long Island.

William P. Bannister, Chairman of Legislative Committee, briefly outlined the work of his committee at the coming session of the legislature and the serious problem for architects in the necessity of combating unfriendly legislation.
This department conducts four competitions each month. A prize of $10.00 is awarded in each class as follows: Class 1, sketches or drawings in any medium; Class 2, poetry; Class 3, cartoons; Class 4, miscellaneous items not coming under the above headings. Everyone is eligible to enter material in any of these four divisions. Good Wrinkle Section: a prize of $10.00 is awarded for any suggestion as to how work in the drafting room may be facilitated. No matter how simple the scheme, if you have found it of help in making your work easier, send it in. Competitions close the fifteenth of each month so that contributions for a forthcoming issue must be received by the twelfth of the month preceding the publication date in order to be eligible for that month's competitions. Material received after the closing date is entered in the following month's competition. The publishers reserve the right to publish any of the material, other than the prize winners, at any time, unless specifically requested not to do so by the contributor.

The prizes this month have been awarded as follows:

Class I—Allyn Gordon, Corsicana, Texas.
Class II—John M. Kerr, Buffalo, N. Y.
Class III—Byron E. Laidlaw, Crestwood, N. Y.
Class IV—Thomas Pao Ho Liang, Tientsin, China.

Christmas cards are starting to come in for our competition but inasmuch as we are going to press early this month we have decided to advance the closing date until January 10th to give even the most belated entries a chance. So if you haven't already sent in your greeting card do it now!

Please be sure to let us know what you think of the first of our new series of cartoons printed on page 67. We're going to publish one of these each month during 1931!

KOH-I-NOOR PENCIL FOUND WITH ANDRÉE'S DIARY

It will probably be of some interest to architectural draftsmen to know that the lead pencil found with the diary of Andrée, the Arctic explorer, whose body was recently discovered in the polar regions after thirty-three years, was a Koh-I-Noor. The report did not state whether or not the pencil was a 2B or softer, so it is not known whether the fact has any architectural significance or not.

AN ODE TO PENCIL POINTS
HORIZONTALLY AND VERTICALLY
By Thomas Pao Ho Liang of Tientsin, China

Pushing a pencil without cease;
Eating sandwiches minus peace.
Nothing must stop him while he draws—
Carefully not to cause some flaws.
I think there's nothing worse in Life
Like an architect with his strife.
Pencil Points his only pleasure,
One great joy that's without measure.
It's a welcome ray of sunshine,
N the South Seas with her moonshine.
To YOU he looks when he is sad—
Sure! Only YOU can make him glad!

Oldest House in Provincetown, Mass., from a Pencil Sketch by Allyn Gordon
(Prize—Class One—December Competition)
PENCIL POINTS FOR JANUARY, 1931

A TOY FOR TIRED ARCHITECTS AND DRAFTSMEN

BY BYRON E. LAIDLAW

(PRIZE—Class Three—December Competition)

A TOY FOR TIRED ARCHITECTS AND DRAFTSMEN

Designed by Thomas Pao Ho Liang of Tientsin, China

(PRIZE—Class Four—December Competition)

Either of the following two directions should be closely followed in order to obtain the best result:

A. Cut out the design below carefully, closely following the outline, and carry it in your pocketbook when it is full of dough and lose it when convenient. There should be no trouble whatever in case you happen to reside in a place called Chicago.

B. Tear this design out roughly and bring same to your Employer when he is at his busiest and request from him a piece of cardboard. Tell him what you want it for. Then from his desk pick up the jar of paste and use it liberally to stick the design on to the piece of cardboard. Be sure to leave sticky fingerprints all over his desk. You will then hunt for the scissors, upsetting the bottle of ink in the meantime. When at last you find them you will closely follow the outline with careful manipulation of the instrument. Better take your time in cutting—take an hour, if possible—at your Boss will like you so much more when he sees you working with such earnestness and cheek. More than certain he will raise your present salary, provided it is nothing. When completed, insert his tie-pin in center and spin it before his eyes, spelling death. You'll be surprised at the result! But no matter what may happen be nonchalant and light one of his favorite cigars as you make your exit on a stretcher.

A SIMPLE ADJUSTABLE TRIANGLE

By J. Carroll Tobias

(PRIZE—Good Wrinkle—December Competition)

Any ordinary forty-five- or sixty-degree triangle can be very easily made adjustable to various angles by the simple addition of an eccentric as shown in the illustration. The eccentric may be made of celluloid, hard rubber, bakelite, wood, or any similar material, and is held to the triangle by a small screw and knurled nut. This construction is shown in the cross-section. The screw should be one with a flat head that can be filled flush with the back of the triangle. About a 6-32 screw is quite large enough, and a knurled nut can be secured at the radio counter of any "Five and Dime" store. When the eccentric is not in use it can be swung up out of the way or removed entirely. Calibration marks may be cut into the eccentric to indicate definite angles, in this way further increasing its usefulness. Such a device is of great value when drawing screw threads, section-lining at odd angles, and work of like nature.

'TWAS EVER THUS

By John M. Kerr

(PRIZE—Class Two—December Competition)

'Twas the opening night of "Community Hall,"

A building designed to accommodate all,
The Council's debatings—the Firemen's wagon,
An up-to-date Cooler, and, honest, no braggin'
The plan was a dandy—the fixings just swell,
Complete from the Corner Stone up to the Bell.

'Twas a sight for sore eyes as his worship the Mayor
Began to orate to the gang gathered there.
The Hall sure was packed from the floor to the rafters,
Good honest faces before and abaft us.

Country lads, each clinging tight to his "Mabel"
Waiting as patiently as they were able,
For, after the speeches the dancing was free
With the I. O. D. E. dishin' ice cream and tea,
College boys steppin' with cute little nifties,
Aldermen pompous, well up in the fifties.
Tough lookin' bozos and gay racketeers,
Limousine ladies decked out to the ears.
Attar of Roses and perfumes exquisite,
Mingled with garlic and other "What is it?"
Bankers and Brokers were sniffin' the air.
Bless me! if all the darn town wasn't there
With the single intention and object in view,
To cast the old optic on somethin' that's new.

The Mayor started in to congratulate all
The different contractors who'd worked on the Hall—
For they'd followed the plans with meticulous care,
To erect this great building—this monument fair.
He praised the foundations—the columns of steel;
The Façade he described as being almost unreal
In its beauty, and symmetry—Columns so white—
Ghostly, like schooners that pass in the night.

The Masons were fêted as Wizards of Oz—
The Plumbers were Plumbers—How come? Why, because
For once pipes were laid with a speedy precision,
And laid where they ought to be laid, in addition.
The Walls were so white, and so beautiful too,
They took off their hats to the Plasterers—Whew!
Carpenter, Painter, each hard-boiled mechanic
Blushed rosy red in embarrassing panic.
What a gay saturnalia of brotherly love;
On everyone's shoulder there rested a dove.

The Building was open—all cares were forgotten,
The audience rose, and stand at attention.
Why, he didn't get even DISHON'RBLE MENTION!
PRATT ARCHITECTURAL CLUB

THE ANNUAL FALL DINNER of the Club was held on November 19, 1930, at the Fraternity Club and proved to be a splendid success. More than eighty members and friends gathered around the festive board, some coming a considerable distance from up-state and neighboring states.

In view of present economic conditions it was felt that the attendance was very gratifying.

Following the dinner a number of speakers were heard from, including Donald Fletcher, Instructor in Senior Design at Pratt; J. Floyd Yewell, widely known artist and delineator; and Ralph Walker, of the firm of Voorhees, Gmelin, and Walker, who told of the plans under way for the Chicago World's Fair in 1933, and of the work being done by the group of architects associated on this great project.

Our only regret was that Mr. Walker could not talk at even greater length on this fascinating subject.

Plans are in full swing for the Second Annual Dance to be held at the Architectural League, New York, on Saturday, January 24th. Those who attended last year's affair were unanimous in requesting that another affair be held by the Club, and at the same place. One of the best orchestras has been secured and the Committee is preparing for a large crowd. All Pratt men and their friends will be welcome.

ARCHITECTS' LEAGUE OF HOLLYWOOD

At a recent meeting of the Architects' League of Hollywood, L. G. Scherer was elected President; Vernor B. McClurg, Vice-President; and J. A. Murray, Secretary-Treasurer.

The League contemplates a year of very active endeavor. The principal tasks which it has outlined for itself are:

1st: The education of the layman to a keener appreciation of the economical and aesthetic importance of architecture.

2nd: The initiating of a definite program to bring about a new and more economical plan of financing building operations.

PENCIL POINTS COMPETITION DRAWINGS ON EXHIBITION

A selected group of designs for an Eight-room House and Two-car Garage submitted in the PENCIL POINTS' Competition is now being shown at the Boston Architectural Club. The latter part of this month they will be on exhibition at the Massachusetts Institute of Technology, Rogers Building, Boston. In early February the drawings will be on view at the Cambridge School of Landscape Architecture and on February 15th the Architectural League of New York will show them.

CONCERNING THE REGISTRATION LAW

Several months ago we received a letter from two subscribers drawing to our attention a certain abuse of the New York Registration Law whereby a certain gentleman, although not a competent architect, was permitted to file plans. We have brought this matter to the attention of the proper authorities, who will undoubtedly take steps to investigate and correct the illegal action.

A CORRECTION

Charles H. Holmstrom, whose design for a small house was published on page 897 of the November issue, lives at 4271 Aloha Place, San Diego, California, not in State College, Pennsylvania, as erroneously printed.

WINNING DESIGN IN A COMPETITION FOR "THE SOLDIER'S MEDAL," GAETANO CECERE, SCULPTOR

[68]
A CROWDED CITY pleads for space... swiftly, floor on floor, the sure steel climbs—and thirty-five or forty city "plots" stand where there was one before.

Structural steel not only multiplies the precious bit of ground. It increases rentable floor area. Its great strength is not handicapped by excessive bulk, so interiors may be larger without conspicuous construction members. Steel comes to a job ready to go into place. It is unaffected by rain, freezing or intense heat. Erected quickly, wherever and whenever men can work, it saves time, labor, interest charges.

More and more homes, small apartment and mercantile houses, small industrial plants and small as well as large bridges are being built with structural steel. Architects and builders are realizing that the employment of steel merely to give strength and security to weaker materials is a compromise with its many advantages when used in the form of structural shapes.

Before building anything, find out what steel can do for you. The Institute serves as a clearing house for technical and economic information on steel construction, and offers full and free co-operation in the use of such data to architects, engineers and all others interested.

The co-operative non-profit service organization of the structural steel industry of North America. Through its extensive test and research program, the Institute aims to establish the full facts regarding steel in relation to every type of construction. The Institute's many publications, covering every phase of steel construction, are available on request. Please address all inquiries to 200 Madison Avenue, New York City. In Canada, to 710 Bank of Hamilton Bldg., Toronto, Ontario. District offices in New York, Worcester, Philadelphia, Birmingham, Cleveland, Chicago, Milwaukee, St. Louis, Topeka, Dallas, San Francisco and Toronto.

"SKYSCRAPER HANGAR IN A METROPOLIS," BY HUGH FERRISS. AN ENLARGEMENT, ON SPECIAL STOCK FOR FRAMING, WILL BE MAILED WITHOUT CHARGE TO ANY ARCHITECT, ENGINEER OR BUSINESS EXECUTIVE.
Publications on Materials & Equipment

Of Interest to Architect, Draftsman and Specification Writer

Publications mentioned here will be sent free unless otherwise noted, upon request, to readers of Pencil Points by the firm issuing them. When writing for these items please mention Pencil Points.


Herman Nelson System of Ventilation.—A.I.A. File No. 30-4-1. Valuable new handbook for architects and engineers deals comprehensively with the history and science of ventilation and describes in detail the operation and construction of this system of ventilation and the Her-Nel-Co ventilator for use in schoolrooms and similar spaces. Complete engineering data, specifications, detail drawings, etc. 104 pp. 8½ x 11. The Herman Nelson Corporation, New York, N. Y.

Design Edition—Rubber Flooring News.—The special design edition of this monthly publication illustrates the prize-winning and many other interesting designs that were submitted in a recent rubber flooring design contest conducted by this firm. Also describes and illustrates fourteen standard types of patterns. A useful collection of material to anyone interested in the subject of decorative floor treatments. The October issue illustrates wide range of rubber flooring applications. 8½ x 11. The Goodyear Tire & Rubber Co., Akron, Ohio.

Modern American Hardware by Sargent.—Handsome new brochure illustrates numerous standard designs of Sargent hardware showing the influence of some of the current thought in the architectural field. 16 pp. 8½ x 11. Sargent & Company, New Haven, Conn.

Kewanee in Service in Schools.—A.I.A. File No. 30-c. New publication illustrates more than 450 typical school buildings, grouped geographically, in which Kewanee steel heating boilers have been installed. Brief descriptive notes accompany illustrations. 128 pp. 8½ x 11. Kewanee Boiler Corporation, Kewanee, Ill.

Hospital Cabinets.—A.I.A. File No. 35-a. Architect's filing folder with recommended specifications and series of detail sheets covering hospital cabinets of the built-in flush type. 8½ x 11.

Art Metal Construction Co., Jamestown, N. Y.

Mosaic Tiles for Architectural and Decorative Purposes.—A.I.A. File No. 23-a. New catalog covering an extensive line of Faience floor and wall tiles, mosaic wall tiles, decorative borders, ceramic floor tiles, trim tiles, bathroom accessories, etc. Included are color charts and many designs reproduced in full color. 20 pp. 8½ x 11. The Mosaic Tile Co., Zanesville, Ohio.


Published by the same firm, "USG Sound Insulating Machine Bases." A.I.A. File No. 37-a. Descriptive folder covering the construction of this type of machine base, adaptable for use under practically all kinds of machinery. Specifications, details, etc. 8½ x 11.

Welco Electro-Kabinets and Radiator Furniture.—New descriptive and illustrative line of electrical and sanitary medicine cabinets and radiator furniture for use in homes, hotels, apartment houses, office buildings, etc. Also covers toilet and shower partitions of various types of incinerators. 12 pp. 8½ x 11. Welco Welded Products Corporation, 16th and Cleveland Ave., Kansas City, Mo.

Whatman Drawing Papers.—A booklet of samples of this line of drafting papers prepared for distribution to architects, artists, draftsmen and engineers. Included is a new etching paper and tables showing complete list of sizes, weights and surfaces. H. Reeve Angel & Co., Inc., 7 Spruce St., New York, N. Y.


Abrasif-Metal Anti-Slip Products.—New publication for architects and specification writers dealing with the subject of Feralon, Bronzalum, Alumalum and Nicralum anti-slip safety products. Descriptive data, specifications, detail sheets, etc. 12 pp. 8½ x 11. American Abrasive Metals Co., 50 Church St., New York, N. Y.


Published by the same firm, "Elevator System in the Empire State Building." Bulletin B-268. A brief description of the installation and operation of the elevator and signal systems, together with other facts of general interest concerning the Empire State Building. 8 pp. 8½ x 11.


Minwax Membrane Waterproofing.—A.I.A. File No. 7-a-1. A useful new document for architects, engineers and specification writers containing descriptive and application data on installations, measurements, etc. 24 pp. 8½ x 11. Minwax Company, Inc., 11 W. 42nd St., New York, N. Y.

Hoffman Controlled Heat.—Illustrated document covering this type of vapor vacuum heating system. Included are brief technical descriptions of this line of heating specialties, their construction, together with their various combinations for different types of installations, measurements, etc. 48 pp. Hoffman Specialty Co., Waterbury, Conn.

Published by the same firm, "How to Lock Out Air—The Heat Thief!" Booklet with useful data on the subject of Hoffman vacuum valves, also complete description of their operation in connection with one-pipe steam heating systems.

Acoustex—The Decorative Sound Absorbent.—A.I.A. File No. 39-b. New brochure for architects and specification writers discusses several of the important phases of the general problem of architectural acoustics. Included is complete information on this type of acoustical correcting and sound-quelling material suitable for use in theatres, auditoriums, churches, court rooms, hospitals, libraries, offices, schools, etc. Specifications, details, color plates, etc. 24 pp. 8½ x 11. Housing Co., Acoustical Division, 40 Central St., Boston, Mass.

Caswell Shooting Gallery System.—Folder with descriptive data and construction details covering the Caswell target carrier adaptable for installation in armories, universities, high schools, police buildings, etc. Also describes a portable gallery for use in residence basements and attics. 8½ x 11. Caswell Shooting Gallery Equipment Co., Anoka, Minn.


(Continued on page 102, Advertising Section)
Sill and jambs lock tight with this new frame... stop air and water leaks!

Newest Andersen patents give architect weathertight installation

FOR THE MODERN HOME or building, architects are turning to window and door frames of genuine white pine... made by Andersen... and now equipped with the new locked sill-joint, 3" per foot sill slope, wide blind stop and other exclusive features. Notice how sill and jambs lock in place... accurate, rigid and leakproof.

In Andersen’s new Master Frame, the architect finds a high standard of accuracy, plus the patented details which insure a permanent, weathertight installation. Each frame is equipped with Andersen patented noiseless pulleys—guaranteed for a lifetime of noiseless, trouble-free operation.

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Replies to box numbers should be addressed care of PENCIL POINTS, 419 Fourth Avenue, New York, N.Y.

Wanted: A young man or woman to teach classes in Architectural Drawing. Must have about 26-30 years of age, healthy, of good appearance and forceful manner, a graduate of a school of Architecture with two years of teaching experience (this may have been as an assistant in College or in evening classes). Work will consist chiefly of teaching working drawings, full size details of residences and renderings in pencil, pen and ink and color. Ability to teach is desired at this time with appointments to be made if and as the opening develops. Communicate with Mr. Chester L. Thornrike, Department Head, The Technical High School, Springfield, Mass.

Position Wanted: Registered architect, twelve years in private practice and as office manager in New York City and the middle west, wishes to make connection with reputable architectural office as office manager or in executive capacity and very extensive experience in the United States and the United States. A.I.A. and past president of one of its Chapters. Broad general experience and thoroughly versed in all phases of architectural practice. Man of culture and social standing. Box No. 27, care of PENCIL POINTS.

Position Wanted: Young man, age 23, recent University graduate, wishes opening in reputable office. Salary of secondary importance. Box No. 1, care of PENCIL POINTS.

Position Wanted: Young lady, junior draftsman, architectural. Also typist. Five-day week. Box No. 2, care of PENCIL POINTS.

Position Wanted: Architectural draftsman, junior, ambitious, alert, efficient young man. Recent graduate. Wishes position in architect's or builder's office. Willing to start as clerk. Box No. 3, care of PENCIL POINTS.

Position Wanted: Young man, 23 years of age, with one year of college training in architecture and still continuing the course at night, wishes position as beginner in architectural office. Box No. 4, care of PENCIL POINTS.

Position Wanted: California Architects Attention. A young ambitious draftsman, single, age 20, with three years experience in one of the country's best architect's office. Wishes place in office in California or one of nearby states. Work will consist chiefly of sketches, working drawings and details of residence work. A. Hunter, 52nd St., New York, N.Y.

Position Wanted: Junior architectural draftsman with one and a half years' drafting experience. High School graduate. Attending Mechanics Institute evenings, second year, studying drafting and design. 19 years of age. Desires position in architect's office. Box No. 7, care of PENCIL POINTS.

Position Wanted: Architectural designer, artist and draftsman. Nineteen years' experience all types of buildings in this country and in Europe. Graduate of the Fine Arts School in Paris. Box No. 8, care of PENCIL POINTS.

Position Wanted: Senior architectural draftsman, 8 years' experience on floor plans of fireproof buildings, new multiple dwelling, non-fireproof apartments drawn to completion including fronts and figuring steel. Moderate salary. Box No. 9, care of PENCIL POINTS.


Position Wanted: Architect (R.A.) and draftsman, 20 years' experience in New York City and practice. Familiar with all details and branches including various laws and ordinances. Salary arranged. Box No. 12, care of PENCIL POINTS.

Position Wanted: Architectural draftsman, 31, seventeen years' New York experience on various types of buildings and construction, thorough working drawing, plan man and checker. Box No. 13, care of PENCIL POINTS.

Position Wanted: Stenographer-secretary, 7 years' experience in engineering, but experience in real estate fields. Knowledge of bookkeeping. Box No. 14, care of PENCIL POINTS.

Position Wanted: Architectural draftsman, twelve years' experience on Public Buildings, Community Centers, Hospitals, plan layouts, some designing, working drawings from design. Next, reliable, references. Box No. 15, care of PENCIL POINTS.


Position Wanted: University of Pennsylvania graduate in architecture desires association with a college or university teaching architecture. Have had three years' teaching experience and seven years' practical experience. All correspondence confidential. Best references. Box No. 17, care of PENCIL POINTS.


Position Wanted: Architectural drafting student, 18, desires permanent position within walking distance from Chicago Union Depot. Willing to start as draftsman. Box No. 20, care of PENCIL POINTS.


Position Wanted: College graduate, 4 years' experience, desires position in architect's construction company or builder's office doing first class work. Location immaterial. Elroy Ruiz, 228 Eliot Street, Detroit, Mich.

Position Wanted: Ambitious young man, three years at Cooper Union Night School, still attending, desires position with architect, builder or contractor as beginner. John L. Salzone, 1292 Sixth Avenue, New York, N. Y.

Position Wanted: Ambitious young man, 20, desires position in architect's office as beginner. Three years' technical experience. Still attending evening classes. Wishes starting at small salary. Alfred Munson, 101 West 2nd St., New York, N. Y.

Position Wanted: Architectural draftsman, six years' experience in all types of work, including large commercial work, desires position. Can carry job from sketches to completion. Salary $50.00 per week. Frank L. White, 3643 N. Mascher St., Olney, Philadelphia, Pa.

Position Wanted: Young lady who has had excellent experience in the matter of laying out copy in the advertising department of well known agencies, very familiar with architectural work, good receptionist, typist, thorough knowledge of the conduct of an architectural office, would like a position with an architect, builder or allied line. Moderate salary. Box No. 29, care of PENCIL POINTS.

Position Wanted: Architectural draftsman, 27, nine years' experience, seven in country house work, would like position in New York City or New Jersey. Experienced in working drawings and details of residence work. A. Hunter, 1640 Walnut St., East Orange, N. J.

Position Wanted: Young man, 27, general architectural draftsman, eight years' experience, moderate salary. New York or New Jersey suburbs. Anthony Ferrera, 563 Bloomfield Ave, Newark, N. J.


(Other items on pages 76 and 77, Advertising Section)
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(Other items opposite and on page 74, Advertising Section)


Position Wanted: Junior draftsman, three years' experience, desires position with architect or builder. Can do estimating. Simon Slodovek, 667 Osborne St., Brooklyn, N. Y.

Position Wanted: Graduate landscape architect capable of handling any and all phases of the profession. Has had five years' experience in the middle west. The last two years' having been devoted to cemetery development. Good at rendering. Reasonable salary. Can furnish references if desired. Box No. 18, care of PENCIL POINTS.

Position Wanted: Architectural designer, graduate of an accredited school. Sixteen years' experience with leading offices of New York, Pittsburgh and Cleveland. Versed in the styles including modern architecture. Capable at presentation, thorough knowledge of plans and composition for buildings of any types and requirements. Can show preliminary studies and working drawings of previous work. Will consider any location. Box No. 19, care of PENCIL POINTS.

Position Wanted: Architectural draftsman, all-round experience on building and miscellaneous lines. Open for position. Great Lakes States, small wages. Samples. Edward Lechner, 1859 East 70th Street, Cleveland, Ohio.

Position Wanted: Young man, 17, Industrial High School graduate, now attending Pratt Institute, wishes position as Junior draftsman in architect's office. Next, honest and reliable worker. Can secure excellent references. Salary secondary. Adolph Scrimnienti, 495 Koscinsky Street, Brooklyn, N. Y.


Position Wanted: Can you use a man with 25 years' general experience in architecture, both city and country projects? Fifteen years drafting, past ten years specification writing and field supervision. Experienced in most types of buildings encountered in general practice. Age 48. Gentile. Married. Box No. 21, care of PENCIL POINTS.

Position Wanted: Architectural engineering student, 21, three years' college. Will start in any capacity with architect, engineer or builder. Salary secondary to opportunity for thorough practical training. Box No. 22, care of PENCIL POINTS.

Position Wanted: Architectural draftsman, working drawings, scale detailer, full size, checking, construction, superintendence, heating engineer. General specifications, draw plans with specifications and superintendent for heating, lighting, plumbing. Junior High School Work. Can handle job from sketches to completion. Box No. 23, care of PENCIL POINTS.

Position Wanted: Architectural draftsman. College training, desires position with architect or builder. Twelve years' experience in country house work. Now employed as an estimator. Can lay out and supervise work. Box No. 24, care of PENCIL POINTS.

Position Wanted: Registered architect, 13 years' experience in New York on office buildings, apartments, high class duplex and model tenements, school buildings and residences. Sketches, working drawings, details and checking. Familiar with zoning and court requirements, also some experience on specifications and supervision. Box No. 25, care of PENCIL POINTS.


Position Wanted: Willi general contractor or architect. Young man, 26, graduate of a technical architectural school. Two years' experience on metal fronts, doors, windows and moldings. West preferred but will consider any location. Excellent references. Box No. 26, care of PENCIL POINTS.
Free Lance Work: Designs, sketches, renderings, working drawings, construction supervision and interior furnishing. Varied experience in public buildings, stores, theatres, clubs, schools, factories, yachts. Period and modern. Interior architecture and furnishing is an especially developed department; wholesale accounts open for purchasing of interior merchandise. Fees made on a time basis. Definite estimates given. Miriam Hilliard Flick, 607 Fifth Avenue, New York, N.Y. Telephone, Volunteer 5-2489.

Position Wanted: Architectural draftsman, 29 years old, desires permanent position anywhere in U.S. or any foreign country. Eight years' experience in all types of architectural drafting—particularly schools and colleges. Capable of carrying job through from preliminary sketches to complete working drawings including all necessary scale and F.S. details. Also some experience in architectural supervision. Samples of work and recommendations sent upon request. E. W. Taylor, Apt. No. 3, 1112 Roseheath Road, Richmond, Va.

Renderings Wanted: Pencil, ink, crayon, water color, pastel, charcoal. Finished renderings or rough sketches. Quick, simple sketches at low cost. Samples will be shown upon request. Telephone, Volunteer 5-2389.


Position Wanted: Young man, 21 years old, student of International Correspondence School of Scranton, studying architectural drafting. Three years of this work at local High School also, as well as having studied and practiced all available material in the drafting line, architectural and mechanical. One year's experience in the engineering department of a large company making blueprints, filing tracings, tracing, etc. Would like to make connection with an architectural firm where I can gain some real experience beginning as a junior draftsman. Salary sufficient to cover living expenses. Sidney P. Meyers, 1509 Michigan Ave., Menominee, Michigan.

Wanted: Experienced specification writer capable of checking working and shop drawings. Must be a man under fifty, having had field superintending experience and complete knowledge of all building requirements including mechanical. Permanent position. New York City. State in first letter, age, qualifications, and positions held. Box No. 31, care of Pencil Points.

Position Wanted: Young architectural designer and draftsman, nine years' practical experience on residences, office buildings, club buildings, apartments, hospitals, theatres, schools, alterations, etc. Experience has involved designing and carrying work through to completion, including working drawings, details, designing steel and reinforced concrete, rendering perspectives, supervision, etc. Educated at Harvard. Salary $80.00. Would prefer position with opportunity of associating with firm. Box No. 32, care of Pencil Points.

Position Wanted: Registered architect in New Jersey and New York, 39 years old, and married. Seventeen years' experience and have thorough architectural training in all its branches. Box No. 33, care of Pencil Points.

Association Wanted: Architect with high class practice in New York for 35 years has in mind retiring in a few years. He desires to associate with a younger architect or firm with good training and practice, to occupy adjoining offices or the same suite if conditions permit. Box No. 34, care of Pencil Points.

Wanted: Experienced specification writer capable of checking working and shop drawings. Must be a man under fifty, having had field superintending experience and complete knowledge of all building requirements including mechanical. Permanent position. New York City. State in first letter, age, qualifications and positions held. Box No. 31, care of Pencil Points.
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Scuff, scuff! Scrape, scrape! The worn-out years go through the doorway into oblivion. With them go the depreciated things you specified a long time ago.

At the threshold of a New Year resolve to specify new thresholds—Rixson Thresholds. The extruded ribs and hard metal will offer better resistance to the scuff and scrape of many new years. There is a saving not only tomorrow but today in installation with Rixson Floor Checks for which Rixson Thresholds can be had ready-drilled. For color harmony you may choose either the white of aluminum or the warmer tone of architectural bronze.

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THRESHOLDS
OF
ARCHITECTURAL BRONZE or ALUMINUM

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FOREMAN BANK BUILDING
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Nailcrete—the original nailing concrete—is specified as the nailing base for floors and roofs in many of the country's finest buildings because of its safety, durability and economy. Nailcrete is fire-proof, rot-proof and impervious to heat, cold or moisture. Furthermore, when used under wood floors it eliminates sleepers, sleeper clips, fill and underflooring.

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**NEW STATE THEATRE**
MANCHESTER, NEW HAMPSHIRE

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PERMANENT AS ONLY NICKEL ALLOYS CAN BE

WHERE WEAR IS HARDEST

MONEL METAL INSURES LASTING BEAUTY

YOU find evidence of Monel Metal's increasing architectural use on every hand—in homes, in office buildings, banks and public institutions of all kinds. To doors, railings, grille work, store fronts and ornamental metal work Monel Metal brings a degree of beauty and permanence that only this lustrous Nickel alloy can give.

Monel Metal's silvery beauty blends perfectly with every scheme of decoration...lending a crisp note of modernity to any style of design...providing strength that asks no favors of time or weather...combining many advantages in the most modern of new-day materials—Monel Metal!

Monel Metal gets its silvery beauty from Nickel—the whitening, strengthening partner used in many modern alloys—stainless steel and Nickel Silver, to mention only two. Nickel gives Monel Metal its steel-like strength, its immunity to rust and high corrosion-resistance. Because Monel Metal is two-thirds Nickel, it is one of the easiest materials to clean and keep clean. Being solid throughout, like sterling, with no coating to wear off, Monel Metal always retains its original lustre and attractiveness.

When planning future metal work remember that "Nickel Alloys look better longer". Let us send you complete information about Monel Metal in the metal arts.
Rich Colors and Greater Thickness place Rubber Tiling in Constant Demand Where Appearance is Vital---

In IMPRESSIVE Bank Lobbies and other public spaces subject to considerable foot traffic, the flooring specified must be of a quality that will not fade or the colors show signs of wear during the life of the installation.

The true, permanent colors of New York Belting and Packing Company's tiling are an integral part of this material, extending through the full thickness of the tiles. They are unaffected by the most severe traffic conditions.

The superior three-eighths-inch thickness recommends this tiling for heavy duty. Many floors laid more than twenty-five years ago are still in excellent condition. This remarkable wearing quality is due to the extraordinary firmness, thickness and weight, making a floor that is practically permanent.

So constructed as to assure the quiet, resilient, and comfortable floors so necessary in banks and offices where the public is to be impressed amid ideal working conditions.

NEW YORK BELTING & PACKING CO.
91-93 Chambers Street, New York

Boston Philadelphia St. Louis Chicago Pittsburgh San Francisco

A PRODUCT OF NEW YORK RUBBER TILE FLOORING
Pencil Points for January, 1931

You need an easily worked lumber for most remodeling jobs

"The trouble with us oldsters is, we criticize youngsters for slap and dash and forget the long seasoning we've had. Take this piece of Pondosa—when it was young and green it wasn't dependable. But now it's cured an' kiln-dried, it'll stay put without warp or crawl." From the philosophy of the boss-carpenter.

In rebuilding and remodeling, you want to specify a wood easy to work—a wood adaptable to many uses. For a paneled wall... a mantel... built-in bookcases for a den... balustrades, railings, cornices... delicate molding, and all other interior trim... for almost any softwood job you're called upon to design, Pondosa is an ideal lumber.

Even-grained, with a surface smooth as satin, Pondosa has all the qualities necessary for this sort of work. Carpenters saw, plane, and finish Pondosa in short order. It takes nails and screws in short grain with virtually no splitting. It lies flat and stays in place. Paints, varnishes and enamels are easily and quickly applied, yet sparingly... Waxed and sanded effects bring out the natural beauty of Pondosa. That's one reason for its popularity in pine paneling work.

Pondosa is rigidly graded, carefully milled, and sized after seasoning. The lumber dealer can supply large quantities on quick notice. And for your protection you can specify all Pondosa by the familiar pine tree trade-mark. Western Pine Manufacturers Association, Portland, Oregon.
Pencil Points for January, 1931

For Textural Qualities...

Venus Pencils

Any design—no matter how intricate—can be developed. Proper tone values are easy. Because Venus Pencils come in 17 shades of black. From 6B softest to 9H hardest.

Are they uniform? Here's our challenge—come to our plant and we'll put in your hands Venus Pencils of any grade for any year since 1905. You'll find the 2H of today exactly the same as the 2H of two, twelve or twenty-five years ago. And so on, in every degree.

A new feature—you can now tell the grade of a Venus Pencil at a glance. Each has its degree of black stamped on three sides. No matter how the pencil lies on the table, the grade is never hidden.

If you are not now using Venus Pencils, choose the degree you prefer and write for a free sample. We want you to try Venus.

American Pencil Co., Hoboken, N. J.

Venus Pencils

17 Degrees of Black—From 9H Hardest to 6B Softest
Copies of the booklet, "Monolithic Concrete Buildings," will be mailed upon request.

PORTLAND CEMENT Association

Concrete for permanence and firesafety

33 W. GRAND AVENUE, CHICAGO

A National Organization to Improve and Extend the Uses of Concrete
THE laying out of a piping system is materially simplified by oxwelding. Where this method of jointing is used, plans are not governed by the availability of standard fittings and the avoidance of specials.

Oxwelding does not change the general design features. Size of pipe, method of suspension, provision for expansion and contraction and location of turns, branch connections, valves and other fittings are the same as for other types of construction. Welded joints and fittings are merely substituted to obtain increased compactness, economy and serviceability.

Under Procedure Control, welded piping construction may be undertaken with the same confidence in a satisfactory result as older methods.
This beautiful California residence

**IS WARMED BY AMERICAN RADIATORS**

- Not only is this one of the loveliest residences in Northern California, but every detail of it has been designed for comfort as well as beauty.
- An Ideal Redflash Oil Burning Boiler sends healthful even warmth to concealed Corto Radiators in every room.
- The architect made sure that the owner would find it just as desirable a home after completion as it appeared in the plans.

**AMERICAN RADIATOR COMPANY**

*DIVISION OF AMERICAN RADIATOR & STANDARD SANITARY CORPORATION*

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MAKE THE FACING BEAR ITS SHARE WITH Natco HEADER BACKER

Natco Header Backer is a proved backing combination consisting of a header furnished in various widths for various wall thicknesses and a double-shell backer furnished in various heights to meet various mortar joint conditions. It is quickly and easily laid up at pronounced savings in labor, mortar and time. It provides a mechanical bond every sixth course establishes heat and cold moisture and sound insulation, renders the utmost in safety, service, permanence, and satisfaction.

For load bearing, curtain, closure, and panel walls, Natco Header Backer offers many outstanding advantages. May we send you literature giving complete details? Also—turn to Sweet's, A-677-730.

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Not many concerns have been in business that long. Those who have survived the business storms of that many years naturally attract your confidence. You know there must be genuine merit in that which they manufacture—they must have maintained high principles—they must have been "square" toward their customers or they could not have scored 29 years of success.

We are naturally proud of our record. That just pride makes us jealous of the reputation of Prometheus Electric Heaters and Prometheus Plate Warmer and Towel Dryer. It compels us to be careful of that reputation—to make sure that every product which leaves our factory is worthy of the name "Prometheus" and deserving of your confidence.

If you want Electric Heaters and Plate Warmers on which you can absolutely depend, insist on getting Prometheus. They have numerous features found in no other make. Write today for our Electric Heating Specialties Catalog.

PROMETHEUS ELECTRIC CORP.
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New York, N. Y.

New Royal Line and Other Bathroom Accessories.—A.I.A. File No. 25-i and 26-i. Catalog No. 894. Just issued, illustrates and describes a full line of china bathroom accessories, medicine cabinets and mirrors, including the recently developed Royal Line of decorative equipment. Specifications, color plates, installation details, etc. 16 pp. Standard filing size. The Fairfacts Company, 234 West 14th St., New York, N. Y.

Air-Way Heating Systems.—A.I.A. File No. 30-d-i. Looseleaf catalog contains complete descriptive and technical data covering the Air-Way unit heater for industrial use and the Air-Way Aeriet, a built-in wall type heating unit operating from steam, hot water, vapor or electricity for use in homes, apartments, hotels, offices, hospitals, etc. Specifications, tables, installation details, etc. 80 pp. Standard filing size. Air-Way Electric Appliance Corp., Heating System Division, Toledo, O.


Mac-Mar Steel Framing.—New catalog with complete data, details and illustrations showing the elements of Mac-Mar steel framing, the sequence of operations in assembling them for all types of buildings, and standard methods of attaching all normal building materials. Useful reference document for architects on this type of construction. 16 pp. Standard filing size. Steel Frame House Co., Pittsburgh, Pa.


Stanwood Electric Welded Steel Heating Boilers.—A.I.A. File No. 30-c-1. Bulletin 108. Descriptive data, specifications, rating and dimension tables and arrangement diagrams covering this type of electric welded steel heating equipment for coal, oil or gas burning. 9% x 11. The Stanwood Corporation, Cincinnati, Ohio. Published by the same firm, "Stanwood Horizontal Tubular Boilers." Catalog No. HT-30. Useful information for architects and heating engineers on this type of heating equipment. Numerous changes in design and construction are featured including steel casing setting of the catenary bag type. Specifications, blue print drawings, etc. 32 pp. 9% x 11.

Kernerator Incineration for Waste Disposal in Industrial and Commercial Buildings.—A.I.A. File No. 35-i-41. Catalog No. 257, just issued, is devoted to the subject of waste disposal in industrial, commercial, governmental and other non-residential buildings. Included are descriptions of incinerators suitable for such installations. 12 pp. 8½ x 11. Kern Incinerator Co., 3707 North Richards St., Milwaukee, Wis.


Published by the same firm, "Architecture of the Night." A.I.A. File No. 31-F-34. Publication GED-375. A presentation of a series of articles in which the possibilities of architectural illumination are discussed by prominent architects. 14 pp. 8½ x 11.

Brownskin Building Paper.—Bulletin with descriptive and test data covering this kind of waterproof building paper. 4 pp. 8½ x 11. Angier Corporation, Framingham, Mass.


Published by the same firm, "Paneling Need Not Be Expensive." A.I.A. File No. 19-e-3. New bulletin discussing the advantages of Idaho white pine for paneling. 8½ x 11.

Perforated Steel Sheets.—A.I.A. File No. 2 to Catalog 26-26A shows a number of new designs in perforated steel sheets. 8½ x 11. J. G. Bruun Co., 537 W. 33rd St., New York, N. Y.
STAINED GLASS WINDOWS

- Churches
- Masonic Buildings
- Residences
- Memorials
- Window—Church of St. Anthony, Bronx, N.Y.

Architect
James W. O'Connor

Research - Design - and Construction by
A. L. BRINK STUDIOS
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These famous windows add charm to interiors and exteriors. A wide range of sizes and shapes provides almost unlimited choice in your architectural treatment.

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used . . . .

. . . and endorsed by
UNITED ELECTRIC RAILWAYS CO., Providence, R.I.

(Winner 1st Award, Class A Bus Transportation Maintenance Award for 1930 . . . . . . .)

So do all firms who will be satisfied with nothing short of the BEST . . . And there is a very good reason for this: Kinnear originated the interlocking steel rolling door . . . Kinnear's entire 12-acre plant devotes its entire energies to perfecting one product—ROLLING DOORS . . . and every Kinnear door is made and engineered "to order". Send for your free copy of the Kinnear catalog and details of Kinnear Engineering and Estimating Service available without cost or obligation.

THE KINNEAR MANUFACTURING CO.
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Boston Chicago Cincinnati Cleveland Detroit New Orleans
New York Philadelphia Pittsburgh Kansas City Washington

(Photo of Kinnear Door in their New Bus Terminal Garage)
In this New Bell Telephone Building

A SHIELD OF STEEL ENCLOSES

CL BREAKERS

THE impressive new 209 West Seventh Street Bell Telephone Building in Cincinnati has every feeder circuit protected by Westinghouse CL carbon circuit breakers mounted on the latest type dead-front, dead-rear steel switchboards. One hundred and seventy-six breakers are used in this building. These breakers are the same one-piece frame type that have been installed during the past few years in many other prominent buildings, such as the Chicago Civic Opera building, the Chrysler building, the Grant building in Pittsburgh, and the Atlantic City Auditorium. Compactness, quiet operation, neat appearance, trip-free arrangement and unbreakable carbon contacts are a few features which were developed from field and high-power laboratory tests to meet the electrical protective requirements of today's buildings.

If your file 31-D-44 does not contain copies of circular 1705-C please request them from our nearest district office.

Service, prompt and efficient, by a coast-to-coast chain of well-equipped shops

Westinghouse

TUNE IN THE WESTINGHOUSE SALUTE OVER THE N. B. C. NATION-WIDE NETWORK EVERY TUESDAY EVENING.
A Prize Competition for a Radiator Grille

The Program
An end wall of a large public lobby has a radiator recess 20 x 60 in its greatest dimensions, the front of which is to be gridded. The depth is excessive so the competitor is free to establish any desired relation of the grille to the face of the wall. The form of the opening and treatment of the wall is unrestricted, and the competitor is free to use intermediate members or panels of any form or material to satisfy structural or aesthetic demands.

The grille may contain as many different unit designs as the competitor desires, and these may also vary in size. Units may be grouped, staggered, alternated, or arranged in bands in any direction or composition.

Bands may be arranged as part of a wall treatment and they may be raised, depressed, "V" shaped, curved, semi-circular or in any simple form that could be produced within the practical limits of the manufacturer's process.

Great stress in judging will be laid on the design of the units. Although designs that may be produced by punching alone are easy to fabricate, competitors may submit designs that require bending as well. These may be designed for specific radiator conditions which, by the unique forms evolved to satisfy definite conditions, would render both efficiency in its function and beauty in its effect. The outcome of any research of this nature that has been developed in the design may be explained to the jury by the use of brief notes and diagrams. The maximum area (or areas) permitted for this purpose shall not exceed 42 square inches.

The competitor must bear in mind that the manufacturer's product is produced with a die in a perforating press. This does not strictly limit to punching, as bending can also be performed with punching. Any metal or combination of metals may be used, as the manufacturer now fabricates from steel, brass, bronze, Monel metal, stainless iron, and aluminum. The stock ranges from 20 gauge (.0375") to 1/4 inch thick. A unit in the design of a grille should not be more than 3 inches, as experience has taught that larger units result in large margins when a dimension is not evenly divisible by the size of a unit. Units may be as small as 3/8 of an inch. This size, common in radiator enclosures, is usually punched from 20 gauge stock while the larger units range from 24 gauge to 3-16 of an inch. Embossing is not practical in gauges greater than 20 gauge. Long unsupported bridges and unsupported projections are difficult to make and to maintain in hardened steel dies especially for 3/4 to 3-16 metals. A study of the manufacturer's catalogue will be of assistance in determining present practices.

The requirements of good practice in heating and ventilating demand the open work in a grille to be at least 50%, preferably 65%, or 70%, of the area. In the smaller units with the thin metals this may range from 45% to 55% open. These figures apply only to the units (or grille surface) as the recess opening is larger than required for the radiator.

Final Drawing
Drawings will be received at the Architectural Sketch Club of Chicago up until 10 P. M., Feb. 15, 1931. Local competitors shall deliver their drawings by messenger. All mailed entries must be postmarked prior to that time and will be received on or before Feb. 25, 1931.

The Jury of Awards shall consist of: Frank L. Venning, Chairman, of Granger & Bollenbacher, Architects; David W. Carlson, of Holabird & Root, Architects; Philip Maher, Chicago; N. Max Dunning, Chicago, and J. M. Fuller, President of the Harrington & King Perforating Co.

Communication
In order to enter this competition it will be necessary to secure full details. These will be found on page 983 of the December issue of Pencil Points.

The latest catalogue of the Harrington & King Perforating Company's product will be sent to all competitors upon request to the Competition Committee, Architectural Sketch Club of Chicago, 1801 South Prairie Ave., Chicago, Illinois.

CASH PRIZES

<table>
<thead>
<tr>
<th>Prize</th>
<th>Amount</th>
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<tr>
<td>1st Prize</td>
<td>$300.00</td>
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<td>2nd Prize</td>
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<td>3rd Prize</td>
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<td>5th Prize</td>
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and $50.00 to each design the sponsors may desire to use.

THE HARRINGTON & KING Perforating Co.
Grilles of Perforated Metal
5648 Fillmore Street, Chicago
THE LARGEST BANK IN THE WORLD uses

THE Chase National Bank, New York merged recently with the Equitable Trust Company, thereby becoming the largest bank in the world, with assets of $2,800,000,000.

In the downtown offices of the Chase National Bank, 12,800 square yards of W. & J. Sloane double-waxed Battleship Linoleum are used.

More and more frequently architects' specifications call for W. & J. Sloane Linoleum, both because of its inherent quality and because of its wide range of colorful patterns.

W. & J. Sloane Linoleum is made with a natural fine-textured finish, the result of extra-processing in the grinding and mixing of raw materials and extra pressure in the calendars. It is then double-waxed at the plant by an exclusive Sloane process.

When you specify W. & J. Sloane Linoleum you assure your clients of the finest money can buy. It comes to the job double-waxed, is easy to handle and is ready for use the instant it is laid. Examine this superfine finish before you write the specifications. We will gladly send you quality samples.

**W. & J. SLOANE DOUBLE-WAXED LINOLEUM**
The answer to the demand for permanent color is TERRA COTTA.

The entire facade of this unusual building is grey-buff colored Terra Cotta. The spandrels and sinkages dull lead colored glaze. The geometrical decorations over the store fronts highly burnished silver.
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SUPER-SMOKELESS BOILER
The Standard of Performance Comparison

Swirling, twisting, spinning, the white hot gases pass through the Super-Smokeless, scouring the flues, converting the black, smoke-laden curtain of unconsumed gas and fuel that goes up the stack in ordinary boilers into heat and economy.

Showing a proud record of 15 years of sterling service—endorsed by architects, engineers, trade and users—the Super-Smokeless is one of the line of outstanding National Boilers, each backed by a performance bond, that provides an efficient, dependable, time-tried heating unit for every building need. The National Line is fully illustrated in the National Heating Guide—if you haven’t a copy, write for it.

NATIONAL RADIATOR CORPORATION
JOHNSTOWN, PA.

NATIONAL
Made-to-Measure
HEATING SYSTEMS

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THE use of Lord & Burnham apparatus makes it safe and easy to open and close large ventilating units, such as this, at the mezzanine floor of the American Book Building, New York. The screw thread type of apparatus used here holds heavy sash rigidly, at any angle, from tight closed to full open. The small picture above shows the screw thread control rod, and bronze operating box.

Lord & Burnham Co.
SASH OPERATING DIVISION
Graybar Building
New York City
Representatives in all principal cities of the United States and Canada

NATIONAL HEATING GUIDE
Blue Book of the Industry—400 pages of vitally important information; sizes, ratings, measurements, engineering data—an encyclopedia of heating.
COMPLETELY invisible when the door is closed. Flush doors—clean lines—no undesirable projections. Manufactured with scientific precision as befits a quality product—yet surprisingly low in cost.

There is a Soss Invisible Hinge for every purpose. See our line in Sweet’s Catalogue or write direct to us for our own complete catalogue "H".

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Offered optionally on Jamison Doors. Slight extra cost on Stevenson Doors.

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hold them!

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Ankyras hold in any wall, hollow or solid; are self-riveting, self-adjusting; easy to apply; save time; save money and do a better, neater and everlasting job.

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from National Public Service Corp. was for this Important Station

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This station because of improvements in engineering design is reputed to be one of the most efficient steam-operated stations in the country.

Satisfactory completion of contracts for National Public Service Corporation at Wildwood, N. J., Belmar, N. J., and Long Branch, N. J., indicated the fitness of the MacARTHUR organization to handle the pile contract for the South Amboy (N. J.) Station.

Giles Drilling Corporation (an affiliated company) will welcome the opportunity to submit estimates on core borings or soundings of any description.
All the individual character of the architect's design, no matter how rhythmic the flow or modern the conception, can be faithfully reproduced in Northwestern Terra Cotta.

THE NORTHWESTERN TERRA COTTA COMPANY

DENVER - CHICAGO - ST. LOUIS
WHERE STONE AND STEEL BLEND WITH THE BLUE

PENCIL POINTS FOR JANUARY, 1931

A. J. WHITE, M. GARAGE

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Monkers, N. Y.
Which home owner is better satisfied?

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The Kernerator solves forever the problem of disposing of garbage, rubbish, newspapers, magazines, sweepings, tin cans, bottles, etc. To the housewife, the hopper door in the kitchen is a symbol of complete convenience.

Kernerator has become the accepted standard of incineration in the architectural profession. It is guaranteed by a financially responsible manufacturer. It is serviced through a nation-wide organization. See our catalog in Sweet's or write for A. I. A. folder.

With GAS or OIL for HEATING

KERNER INCINERATOR CO.
3550 N. Richards St. Offices in over 150 cities.
HERE is an ideal school class-room wardrobe, low in cost yet meeting every demand of the most exacting. This wardrobe is made for plaster ends, backs and ceilings; no jambs nor trim being required. When so desired blackboards can be furnished for the doors, giving a continuous blackboard surface.

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. There are no noisy tracks nor rollers to stick or bind, nor intricate mechanism to get out of order. These hinges are guaranteed to last as long as the building.

All 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.

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ARCHITECTURAL RENDERINGS
BLACK AND WHITE OR COLOR :: INTERIORS
Service for Architects and Decorators
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Instruction founded on the principles of the Ecole des Beaux-Arts of Paris
Circular on Application

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AND PRODUCTION COST
A report written by
CHARLES KYSON
from data collected and compiled by
THE ARCHITECT'S LEAGUE OF HOLLYWOOD
A 40-page document reprinted from
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Issues of May, June, and July, 1929
PRICE ONE DOLLAR
Published by
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A FRANK TALK TO USERS OF DRAWING PENCILS

Does Your Drawing Pencil Give You What You Expect?

Generally the purchase and use of drawing pencils is a matter of habit until—
The pencil you have always been using fails to satisfy or shows some defect, or
Someone persuades you to try another brand.

In the majority of cases, changes in pencils are made because of dissatisfaction.

But mere satisfaction should not deter you from looking for something finer—something unusual.
There is a drawing pencil that can give you more and that pencil is MARS. The difference between Mars Pencils and others does not cause a thrill which wears away quickly, but an appreciation that grows with every moment of use.

The best way to tell is the old way, the only way. Try MARS. The better dealers in your locality should be able to supply you. But if not, send fifteen cents for sample, to
J. S. STAEDTLER, Inc.
53-55 Worth Street, New York City
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The American Radiator & Standard Sanitary Corp., of New York, has made the following announcements effective January 1:

The resignation of George Herth as vice-president and general manager sales of American Radiator & Standard Sanitary Corp.;

Charles H. Nash, vice-president of Standard Sanitary Corp., is appointed director of publicity of American Radiator & Standard Sanitary Corp.;

A. E. Hershke, sales promotion manager of American Radiator & Standard Sanitary Corp.;

John Hall, general sales manager, European division, Standard Sanitary Mfg. Co., is appointed vice-president and assistant general manager sales of Standard Sanitary Mfg. Co. The resignation of George Herth as vice-president and general manager sales of Standard Sanitary Mfg. Co. has been accepted.

The Hamilton Mfg. Co., Two Rivers, Wis., has recently placed on the market a new dent resistant and photo retouching table No. 102, a new illuminated tracing table for draftsmen. It has a plate glass working surface, and has a sand blast finish on the underside. This plate glass, illuminated from below by two electric lights and a parabolic reflector, its top is adjustable in height and also the working tops. A further addition to this, the top slides forwards or back 10 ft. from normal position.

Claxton E. Allen, formerly manager of the southwestern district of the Western Electric & Manufacturing Co., was elected a commercial vice-president that company at a recent meeting of its board of directors. Mr. Allen's duties of coordination will extend over the domestic appliance division and other divisions serving the household market, such as refrigeration, radio, etc., and also the jobbing outlets, and all products not as may be appropriately developed.

Responsive to the increasing demand for concealed, partly concealed and out-of-the-way radiation, the American Radiator Co. announces a new addition to the line of American radiators. This new development is the Arco radiator. It is made of cast iron, small and compact in design, so that it is easily recessed, enclosed or semi-enclosed. The company has also introduced Arco radiator enclosures in various models designed for recessed and concealed radiation.

The various plastic activities of the General Electric Co. have been coordinated into one department known as the Plastics Department according to an announcement just made by General Swope, president of the company. E. C. Coleman has been appointed manager of the new department with an advisory committee consisting of vice-presidents J. G. Barry, chairman, W. R. Burrows, and C. E. Evelhoch. The new department will be responsible for sales, engineering and manufacturing of plastics and involves activities at the Pittsfield, Schenectady, Fort Wayne, Kingsport, and Lynn (River) plants of the company.

The Associated Alloy Steel Co., Inc., Cleaveland, announces that a new name, "Nevacite", has been given to the Nirosta and stainless steels produced by the company at Steelton, Steel Co., Sharon Steel Hoop Co. and Timken Steel & Tube Co.

The Ward Leonard Electric Company, Mount Vernon, N. Y., announces the appointment of R. C. James as assistant active in the Seattle district. Mr. James' organization will be located at 312 Second Avenue, Seattle, Washington.
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