JULY 1931

PENCIL POINTS

A JOURNAL FOR
THE DRAFTING ROOM

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THIS ISSUE PRINTED

Remarkable discovery in woodworking opens whole new field of decoration

Cabinet wood paneling at 1/5 to 1/2 the former cost

FOR LARGE BUILDINGS: *No longer is paneling too costly for the large wall spaces of public buildings. Already, Flexwood has distinguished many—notably the Chicago World's Fair Building illustrated.*

FOR CENTURIES LIMITED to costly rooms, wood paneling is now, for the first time, practical for both modest homes and very large wall spaces. Through the recent discovery of Flexwood—wood paneling is offered to you in an entirely new form—actually as pliable, as easy to handle and install as canvas.

Oak, Walnut, Mahogany, Lacewood, Prima Vera and other fine cabinet woods are cut into veneers, mounted on fabric, and then, by a special "flexing" process, made so pliable they will round any corner, fit any wall surface.

Think of the wonderful possibilities this introduces! A whole new era in interior design is begun by this remarkable discovery in wood paneling. Every architect or decorator will be interested in Flexwood. Its installed cost is only 1/5 to 1/2 as much as ordinary paneling and it absolutely will not crack, warp, or check.

Find out all about Flexwood. Be sure you have its complete story in your files. On your request, we will be glad to send samples, descriptive literature, and specifications. Or, if you prefer, we will have a representative call. The Flexwood Company, 919 North Michigan Ave., Chicago, the Chrysler Bldg., New York City.

A few of the *Leading Architects* who have specified Flexwood

Holabird and Root, Chicago
Raymond Hood, New York
Philip B. Maher, Chicago
Benjamin H. Marshall, Chicago
Rebori and Wentworth, Chicago
Schultz and Weaver, New York
Shreve, Lamb, and Harmon, New York
William Van Alen, New York

ANY GOOD DECORATOR *can apply Flexwood. It goes up like canvas. Sheets of Flexwood are kept in sequence as they are cut from the log, so that they create a series of matched patterns on the wall.*

FOR HOMES: *With Flexwood, you can specify beautiful paneled interiors for even modest homes. Illustrated is a portion of a distinctive bedroom in natural Mahogany.*

Flexwood

CHOICE CABINET WOODS FOR FINE WOOD PANELING

FOR OFFICES: *Flexwood is available in Walnut, Oak, Mahogany, Lacewood, Prima Vera and several special woods. The distinguished office shown here has Georgian paneling in Matched Walnut Flexwood.*

Pencil Points, published monthly by The Pencil Points Press, Inc., at 258 Atlantic St., Stamford, Conn. Publication office Stamford, Con
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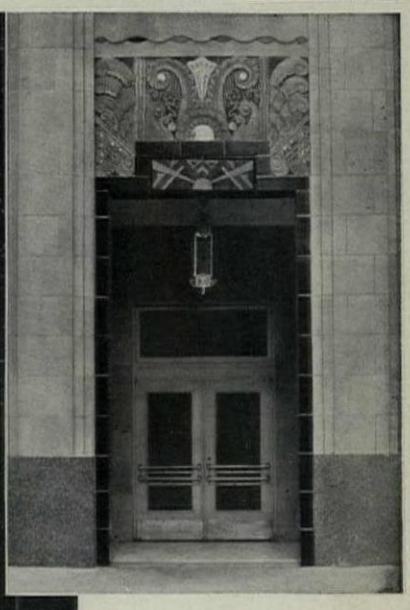
Dated July, 1931

APARTMENT ENTRANCE
340 East 57th Street, New York. A most pleasing combination of black and silver Atlantic Terra Cotta. The base course and first story decorative spandrels are also of Atlantic Terra Cotta.
R. CANDELA, Architect
342 E. 57th ST. CORP., Builders

SCHOOL ENTRANCE, New Jersey Law School, Newark, N. J. A charming entrance in lustrous black, green, tan, mottled blue, sienna and orange Atlantic Terra Cotta, with figure group.
J. B. WERTZ, Architect DOE-WATHEY CO., Builders



OFFICE BUILDING ENTRANCE
Threefoot Bldg., Meridian, Miss. Modern American style with oriental suggestion. The elaborately modelled polychrome Terra Cotta panels have seven brilliant colors in pleasing contrast with base color of mottled tan.
C. H. LINDSLEY, Architect
GARBER & LEWIS, Builders

In the Modern Style — THESE BEAUTIFUL ENTRANCES OF ATLANTIC TERRA COTTA

Of course, an entrance should be inviting, but it can be no more attractive than the materials selected to clothe it. For this reason, Atlantic Terra Cotta is now so frequently specified by architects, particularly for ultra-modern effects, because it is so limitless in its adaptability to the design . . . . With Atlantic Terra Cotta at his command, the architect knows he can choose any color or combination of colors he may prefer, to enrich the portal. He knows, too, that his design may include ornament and figure motif without restriction. For this Company's staff of engineers and artists are capable of translating every design into everlasting Atlantic Terra Cotta, to stand as long as the structure itself, without loss of color or texture.

The Trade Mark of a Superior Terra Cotta

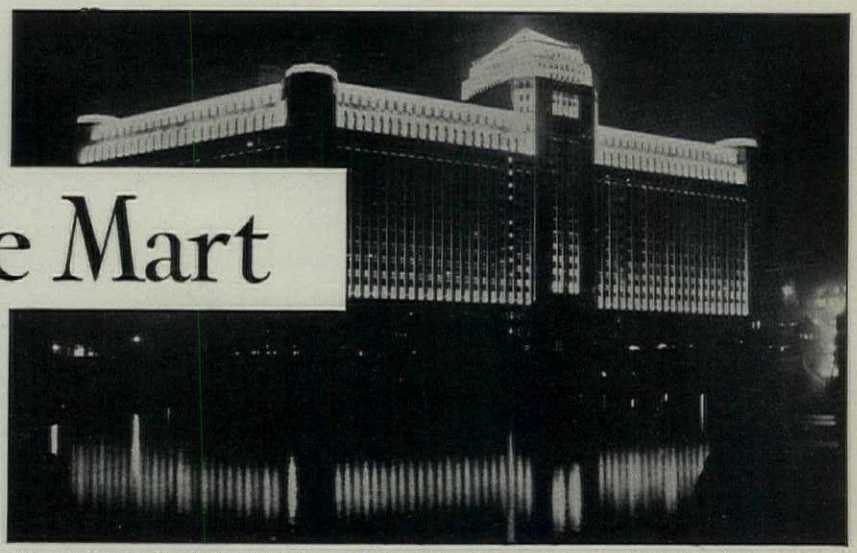
The cost of Atlantic Terra Cotta compares most favorably with other materials. We suggest you consult us freely about the many exterior and interior uses for Atlantic Terra Cotta in connection with new projects.

Specify Atlantic Chimney Pots

ATLANTIC TERRA COTTA CO., 19 WEST 44th STREET, NEW YORK
PHILADELPHIA • DALLAS, TEXAS • SOUTHERN PLANT: ATLANTA TERRA COTTA CO., ATLANTA, GA.

FROM TOP FLOOR *to* TRACK LEVEL *cork insulates*

Chicago's Merchandise Mart



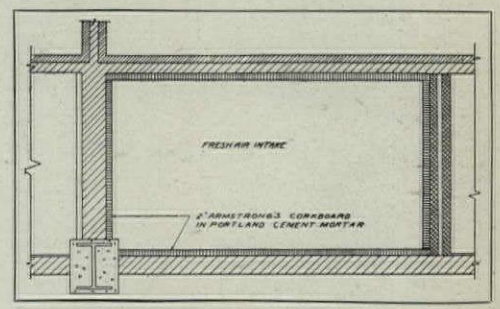
Chicago's Merchandise Mart makes full use of the insulating efficiency of Armstrong's Cork Products. Architects, Graham, Anderson, Probst, and White. General contractors, John Griffiths' Sons.

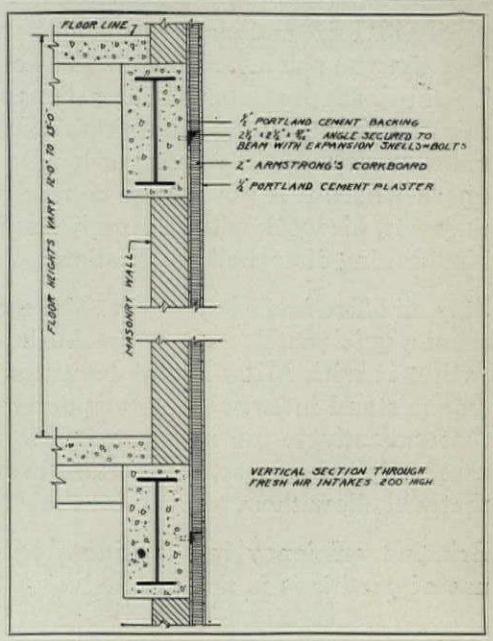
ARMSTRONG'S cork products serve a wide variety of uses in Chicago's huge new Merchandise Mart. Some of them are shown on this page.

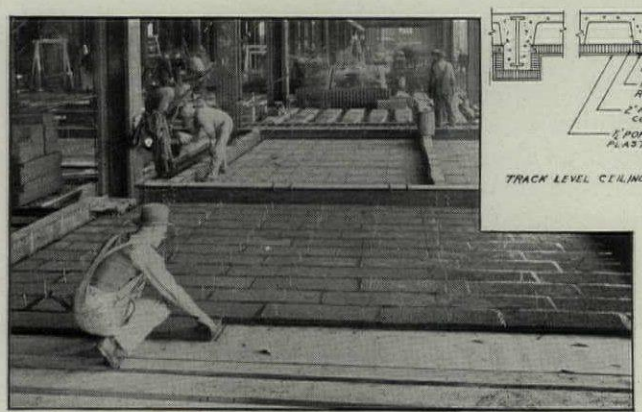
Corkboard in cold storage rooms seals in low temperatures. Cork Covering on brine and ammonia lines protects against loss of refrigeration. Corkboard insulates the fresh air intakes from surrounding rooms. On the ceiling of the track level, a 2″ layer of Corkboard shuts out winter's cold from the upper floors of the building.

Installed under machinery, Armstrong's Vibracork absorbs vibration and muffles the noise that it causes. In the waiting room, Corkboard is used to line the radiator recesses in the walls, and to prevent the loss of costly heat. The radio station on the roof of the building enjoys comfortable temperatures at all times—thanks to cork. And cork promotes health by maintaining proper temperatures in cold water lines, refrigerators, and soda fountain equipment.

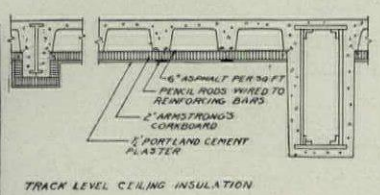
Armstrong engineers are at your service for consultation on any installation involving the use of cork. Address Armstrong Cork & Insulation Company, 902 Concord Street, Lancaster, Pennsylvania.







Workmen installing 172,000 board feet of Armstrong's Corkboard over the track level of the Merchandise Mart. Cork serves throughout the building.



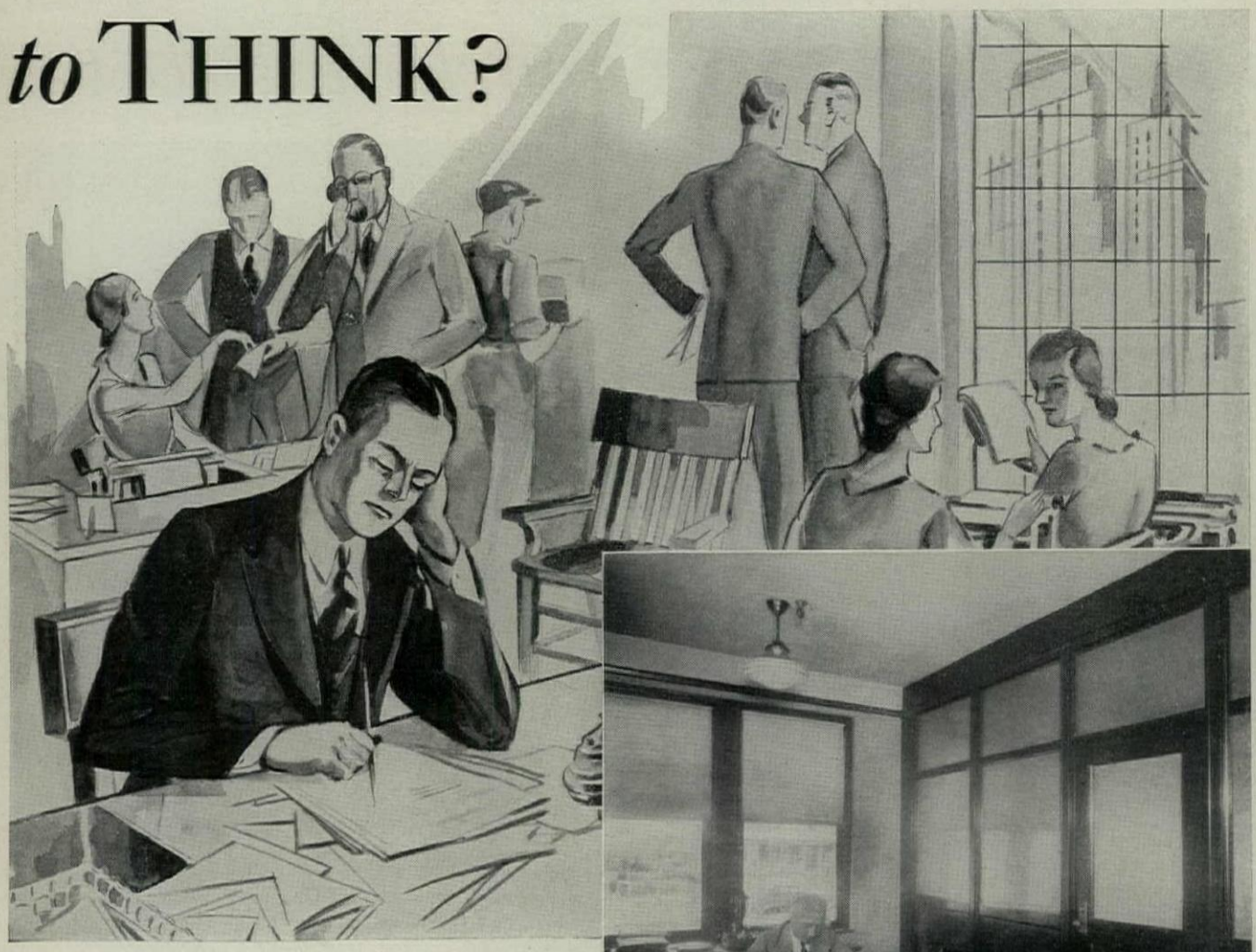
TRACK LEVEL CEILING INSULATION

Armstrong's (A) Product

Armstrong Cork & Insulation Company

CORKBOARD . . CORK COVERING . . VIBRACORK . . CORKOUSTIC . . INSULATING BRICK

How do you expect a man to THINK?



The modern office of Mr. C. E. Needham, the Chandler Products Corp., equipped with Mills Executive Office Partitions

CLUTTER and clatter, hullabaloo and din have no place in the business office today. The business problems of today demand deep thinking, fast thinking and right thinking. And unless every executive can work in an atmosphere where it is possible to concentrate his thoughts, his work will be merely routine and his thinking disturbed and shallow.

Stop all office inefficiency now. Make each department a quick acting unit of the business, by separating it with Mills Metal Partitions from the troubles and influence of other departments. See that executives, the men who guide the life and career of the business, are working in surroundings that will allow them to exercise their brain.

Bringing efficiency into business by the proper use of partitions is not expensive. A Mills Metal partition representative can offer you many suggestions about efficient office layouts, and will describe many other advantages of Mills Metal Interchangeable Partitions. An interesting folder explaining all details will be sent on request.

THE · MILLS · COMPANY

A Mills Metal Partition for Every Purpose

906 WAYSIDE ROAD · · · CLEVELAND · OHIO

Representatives in all Principal Cities

MILLS METAL

INTERCHANGEABLE PARTITIONS

THE use of the reinforced steel shell left on every Raymond Concrete Pile is dictated by the strongest considerations of the preservation of compressive resistance set up by its driving, the adequate protection of the pile column and speed of installation. Study the nine reasons and you will understand why these piles are beneath notable structures everywhere.

JOB 2447
CENTRAL NATIONAL BANK BUILDING
Richmond, Virginia
General Contractor
DOYLE & RUSSELL
Architect
CARNEAL, JOHNSTON & WRIGHT
546 Standard Piles—12,618 lin. ft.
144 Stub Piles—1,579 lin. ft.

Cast in Place Piles
Composite Piles
Precast Piles
Pipe Piles
Building Foundations
Bulkheads and Docks
Underpinning, Etc.
Bridges

RAYMOND CONCRETE PILE CO.

New York City—140 Cedar Street
Chicago—111 W. Monroe Street

BRANCHES:

Atlanta, Ga.
Baltimore, Md.
Boston, Mass.
Chicago, Ill.
Cleveland, Ohio
Detroit, Mich.
Houston, Texas
Kansas City, Mo.
Los Angeles, Cal.
Miami, Fla.
Milwaukee, Wis.
Philadelphia, Pa.
Pittsburgh, Pa.
San Francisco, Cal.
Seattle, Wash.
St. Louis, Mo.
St. Paul, Minn.
Washington, D. C.
Bogota, Colombia
Buenaventura, Colombia
Caracas, Venezuela
Hong Kong, China
London, England
Maracaibo, Venezuela
Palembang, Sumatra
Panama, C. Z.

And in Canada
Raymond Concrete Pile Company, Ltd.
Montreal, Canada

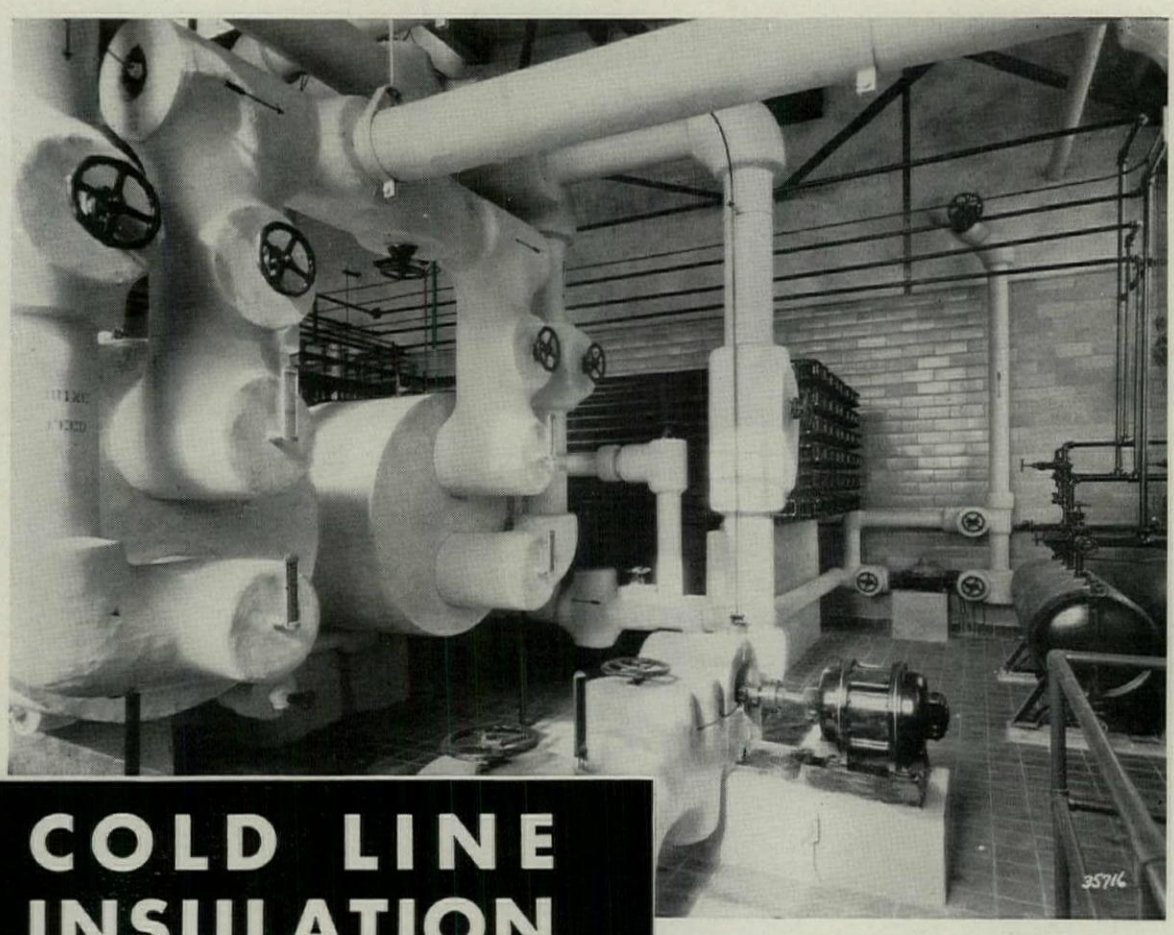
9 reasons

1. *Every operation is subject to inspection.*
2. *The resistance obtained in driving is maintained by the shell which is left in the ground.*
3. *Every pile is pretested, since the ground is not released by the removal of the core.*
4. *The shell confines the concrete so the vibration of driving adjacent piles increases its density.*
5. *The concrete does not come in contact with underground earth or water, thus insuring uniform quality and constant water ratio.*
6. *Piles may be tapered or of uniform cross-section. In friction soils a tapered pile gives much greater carrying power per lineal foot of length.*
7. *They may be jetted without deteriorating the concrete or changing the cross-section.*
8. *The tops of the piles are clean cut and 100% effective.*
9. *Speed—the placing of the pile is effected in one operation.*

RAYMOND CONCRETE PILES

Courtesy American Historical Society ©Brown Bros., Photo.

Some of the more important guests at The Bradley Martin's famous ball held in the Grand Crystal Ballroom of the Waldorf-Astoria in 1896



COLD LINE INSULATION
that fits like a glove

York Ice Machinery Corporation used Novoid Cork Covering to insulate the refrigeration equipment installed by them in the Rockland County State Hospital, Orangeburg, N. Y.

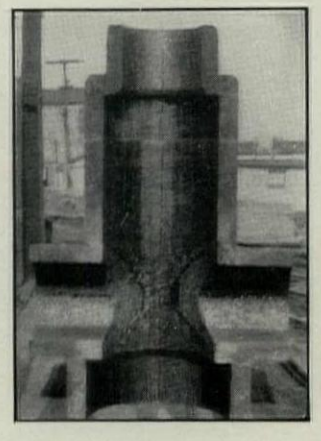
No moisture-collecting air spaces when you use Novoid Cork Coverings

EVEN big, complicated jobs can have perfectly fitting cork insulation on every length of pipe, on every fitting. Makeshift methods are eliminated when you use accurately moulded Novoid Cork Coverings and Fitting Jackets. No need for mitred "stove pipe" covers, plastic or fibrous materials.

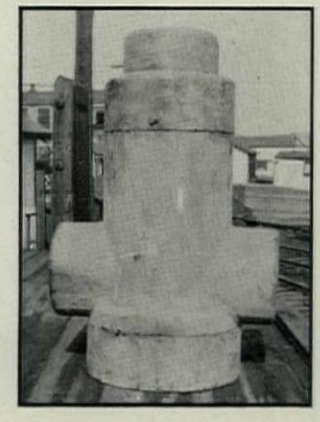
Novoid Coverings retain their insulating value indefinitely. Moisture cannot penetrate the pure cork structure to "rot out" the insulation. A special process tightly compresses small and large particles of cork to form a structurally strong fitting cover that has no voids or air spaces. A coating of mineral rubber gives added protection.

Made in all sizes from ¼ inch, Novoid Cork Covering comes in three thicknesses: *Heavy Brine,* for temperatures from 0°F. to minus 25°F.; *Brine* for temperatures between 0°F. and 35°F.; *Ice Water* for temperatures not lower than 35°F.

Perhaps you would like to test a sample of Novoid Insulation. It will be sent without charge. Address Cork Import Corporation, 345 West 40th Street, N. Y. C.



When you are confronted with an unusual fitting—such as this 4" trap—Cork Import Corporation can make a special Novoid Covering to order.



Novoid Cork Covering

For Cold Lines, Coolers and Tanks

He Took Up the Draftsman's Pencil to Battle Constipation

The daily output of a lathe operator drops. A child grows listless and inattentive as the school day drags into afternoon. An office worker slumps idly at his desk, neglecting the work before him.

The boundless energy that drove a business genius to the top rung of the ladder, slips silently away, leaving only a dull clod of a mind and body.

Yet doctors tell us that constipation is really nothing but a habit—or rather the lack of one. It is a chronic disorder, of millions, induced by irregular evacuation during youth.

The Clow Soldier of Sanitation took up the draftsman's pencil to fight this enemy of modern man and industry.

His first attack was for the coming generation. It resulted in a closet bowl, efficiently designed to make evacuation easier and more certain for school children.

For many years careless designers had been inflicting high bowls upon children in school toilet rooms.

The seat of the Clow Bowl was lowered, 2 inches closer to the floor. The position of the child is natural, with knees high and stomach muscles relaxed. Thus by making evacuation easier, regularity is made more of a habit.

Following this first bowl have come others on the same idea to help grown-ups in all walks of life.

And the Soldiers of Sanitation score another important victory in their battle against uncleanliness, pollution, ill-health and inefficiency.

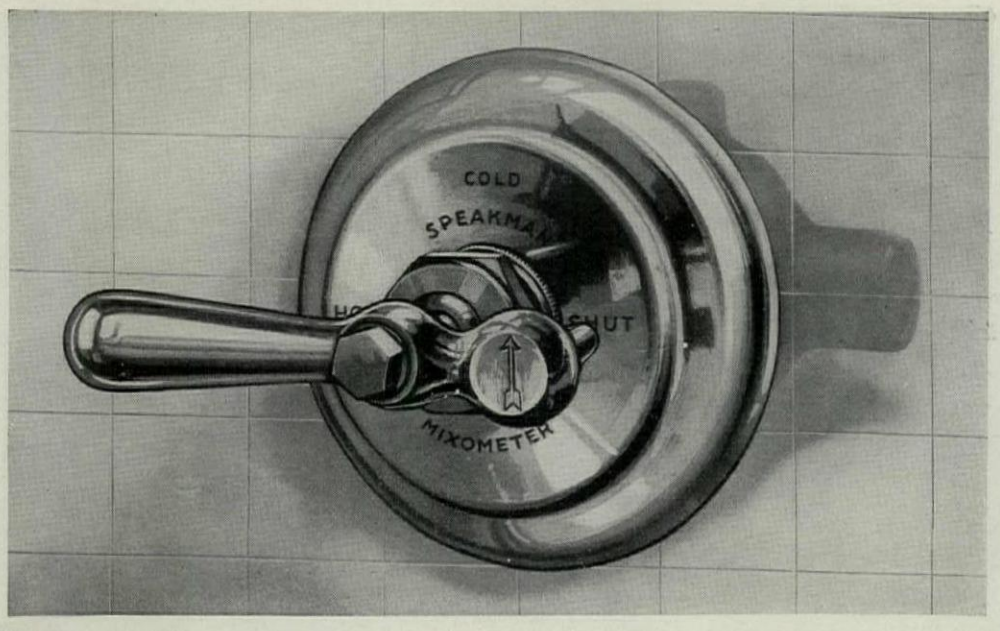
The Clow Soldier of Sanitation is a specialist on the acute problems of sanitation that confront every builder of a school, hospital, industrial plant or other public building. At his finger tips is the accrued experience of Clow's 52 years experience—at his back the complete line of fixtures to meet every mass plumbing need. Call him in. This is Jerry Kinnally, Chicago Office—Arch. Rep.

CLOW

CHICAGO

PREFERRED FOR EXACTING PLUMBING SINCE 1878

Consult your architect



K–3365
SPEAKMAN Built In Mixometer.

K–3395
SPEAKMAN Anystream Self- Cleaning Shower Head. (Pat. Jan. 2,1923)

K–4039-M — SPEAKMAN Mixometer Shower and Tub Combination, having Speakman K-4656 Act-Easy Pop-up Waste, and K-3395 Speakman Anystream Shower Head.

. . . THE MOST MODERN SHOWER COMBINATION IN THE WORLD HAS . . .

the Speakman Anystream Self-Cleaning Shower Head and Speakman Mixometer

THROUGH this modern head and the Speakman Mixometer the bather can have just the desired shower force and volume—a normal or flood shower, or a needle spray, and at the same time the temperature of the shower is under instant control—all degrees from cold to hot within half a turn of the Mixometer handle.

Speakman Anystream Self-Cleaning Shower Heads can be furnished with all types of Speakman Showers, and Speakman Mixometers are made in concealed and exposed types.

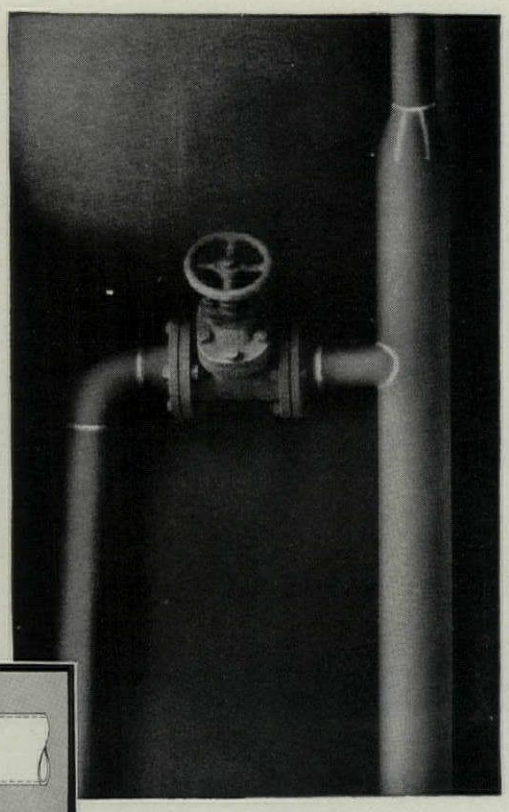
The Mixometer is as simply installed as single valves and it has proven during 20 years of use that it will stand up and require no more servicing than showers having two valves.

Mechanical model Mixometer made of cardboard will be mailed to architects requesting it.

SPEAKMAN COMPANY
Wilmington Delaware

REFER TO SWEET'S ARCHITECTURAL CATALOGUE—PAGES D-4954 AND 4955

SPEAKMAN SHOWERS *and* FIXTURES



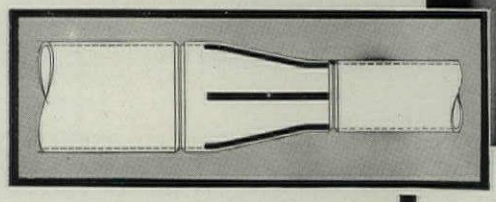
Oxwelding Reduces Radiation Losses

DESIGN STANDARDS FOR OXWELDED PIPING

Any welded piping system, even in its most complicated form, is a combination of a few fundamental welding design details.

SWAGES OR REDUCERS

Explanation of Design:
Formed or fabricated swages, both concentric and eccentric, to meet any condition, may be formed as illustrated on page



31, "Design Standards for Oxwelded Piping."

Uses:
Swages or reducers, either formed or fabricated, are recommended for all sizes, pressures and services for replacing cast swages.

Specification:
When welded swages or reducers are specified the following features should be included in the specification:

1. Templets shall be used for making cuts.
2. Cuts shall be carefully beveled and accurately matched in order to form a good vee for welding.
3. Welds shall be built up to present a gradual increase in thickness from the edge to the center.
4. Thickness at the center of the weld shall not be less than 1¼ times the pipe wall thickness.
5. The weld shall be of sound metal free from laps, gas pockets, slag inclusions or other defects.

The above is excerpted from a handbook on fundamental designs, titled, "Design Standards for Oxwelded Steel and Wrought Iron Piping," published by The Linde Air Products Company. You should have a copy of this handbook. It is yours for the asking.

BECAUSE of minimized radiation surfaces, radiation losses from a welded pipe line, whether covered or not, are less than from a screwed or flanged line.

In addition to this, oxwelded construction permits more efficient insulation and consequent higher operating efficiency. It enables continuity of insulation, impossible where other means of pipe jointing are used. There is also the further advantage that the insulation, once applied, will not be ruined through leakage and will not have to be removed at the joints for tightening gaskets or repairing leaks.

Under Procedure Control, welded piping construction may be undertaken with the same confidence in a satisfactory result as older methods, and with further assurance of increased economy and serviceability.

THE LINDE AIR PRODUCTS COMPANY

Unit of Union Carbide and Carbon Corporation

126 Producing Plants UCC 627 Warehouse Stocks

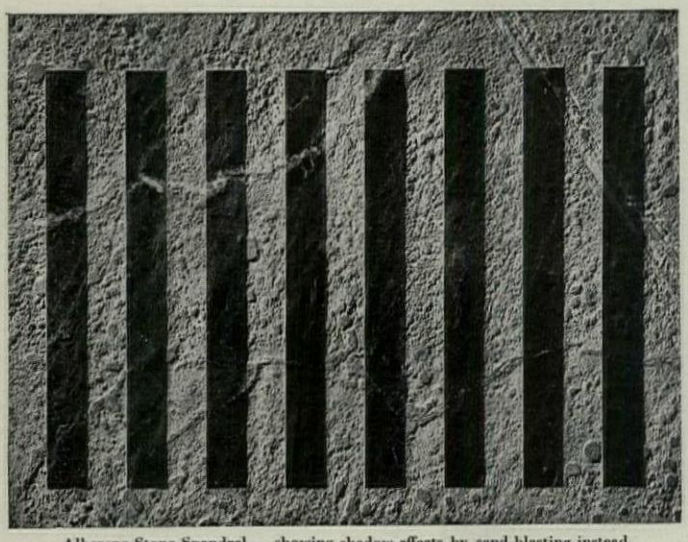
IN CANADA, DOMINION OXYGEN COMPANY, LTD., TORONTO

District Offices

Atlanta, Baltimore, Birmingham, Boston, Buffalo, Chicago, Cleveland, Denver, Detroit, El Paso, Houston, Indianapolis, Kansas City, Los Angeles, Milwaukee, Minneapolis, New Orleans, New York, Philadelphia, Pittsburgh, St. Louis, Salt Lake City, San Francisco, Seattle, Tulsa

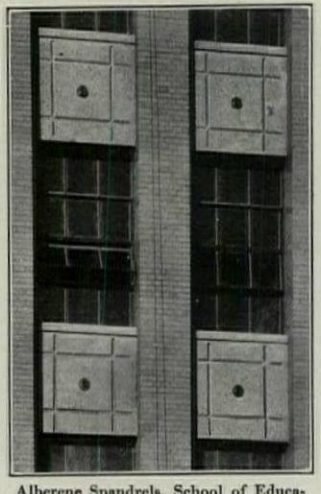
LINDE OXYGEN · PREST-O-LITE ACETYLENE · OXWELD APPARATUS AND SUPPLIES · UNION CARBIDE

Have you considered the use of 1½" thin slabs of SOAPSTONE for Spandrels and Trim ?



Alberene Stone Spandrel — showing shadow-effects by sand-blasting instead of deep reveals. Stone — one and one-half inches thick.

Newark and Essex Bank Bldg., Newark, N. J., John H. & Wilson C. Ely, *Architects.* Alberene Spandrels used.



Alberene Spandrels, School of Education, New York Univ., New York, James Gamble Rogers, *Architect.*

Buffalo City Hall, Buffalo, N. Y., Dietel & Wade — Sullivan W. Jones, *Architects.* Alberene Spandrels used.

THE Spandrel type of construction has brought into prominence the beauty and utility of Soapstone, because almost alone of the natural, quarried stones, it can be cut and furnished economically in thin one and one-half inch slabs.

Its durability under severe weather conditions is attested to by its performance for nearly two hundred years on the exterior of Independence Hall, Philadelphia.

Its neutral bluish-grey tone blends with practically every color. It is unaffected by corrosive fumes and gases.

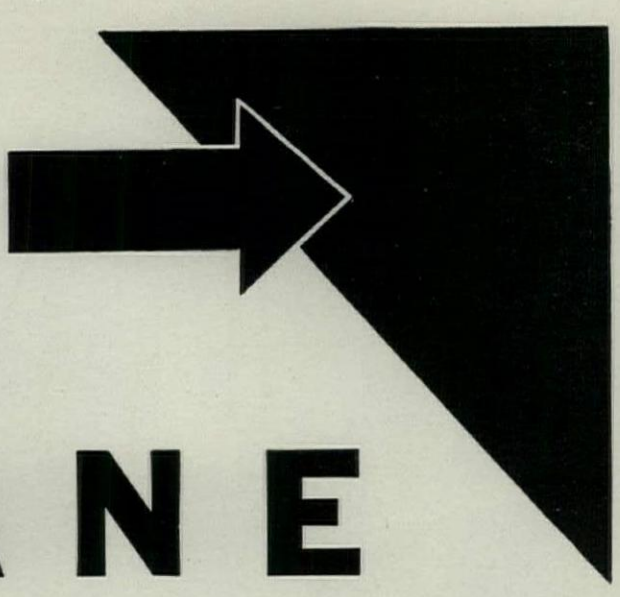
In short, it offers designers a natural stone that can be used to meet today's requirements in wall-veiling to increase usable floor area. It is not necessary to resort to the use of any substitute for quarried stone on the facade of any structure.

ALBERENE STONE COMPANY
153 West 23rd Street, New York

Branches: Boston; Chicago; Newark, N. J.; Washington, D. C.; Cleveland; Pittsburgh; Richmond; Philadelphia; Rochester
Quarries and Mills at Schuyler, Virginia

ALBERENE STONE SPANDRELS
BEAUTIFUL–ECONOMICAL

[*This is the first of a series of advertisements to appear in national magazines on the 1931 Trane schedule.*]



TRANE Launches a National Advertising Campaign

of prime importance to Architects

ON THE opposite page is a reproduction of the first of a series of advertisements which will carry the message of Trane Concealed Convection Heaters to millions of readers—during the remaining months of 1931.

This campaign is significant to you—not only because it paves the way to a ready acceptance when you recommend Trane equipment—but because it reveals the position Trane Heaters hold in the industry *right now*.

The Trane Company has elected to make the advertising investment this campaign entails—not merely because its financial position permits it—but because this period of subnormal building activity has demonstrated, beyond a doubt, that Trane Concealed Convection Heaters have now an outstanding preference among architects, contractors and builders.

Trane's volume of orders thus far in 1931 exceeds their volume for any similar period in *any previous year*—including 1928, 1929 and 1930. Is any other manufacturer of heating equipment in such a fortunate position? This sales record means but one thing—Trane equipment is being used in a steadily increasing percentage of the existing building projects.

The success of Trane Heaters is firmly established—their merits definitely recognized—there is a sales momentum behind them that even a business depression does not retard—and now a great national advertising campaign to *clinch* their popularity. For your own and your client's best interests, may we urge you to be not "*the last to lay the old aside.*" The advertisement on the opposite page outlines the reasons for the rapid, nation-wide adoption of Trane Convection Heaters.

THE TRANE COMPANY, LA CROSSE, WISCONSIN

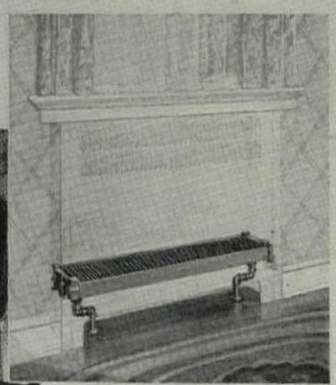
In Canada, The Trane Company of Canada, Limited, Toronto, Ont.

THE SATURDAY EVENING POST June 20, 1931

Old-fashioned RADIATORS BANISHED!

by these new-type heaters concealed in walls

Not a makeshift—but a heater designed expressly for convection heating to be used in walls or cabinet enclosures —can be used with any standard boiler or piping system



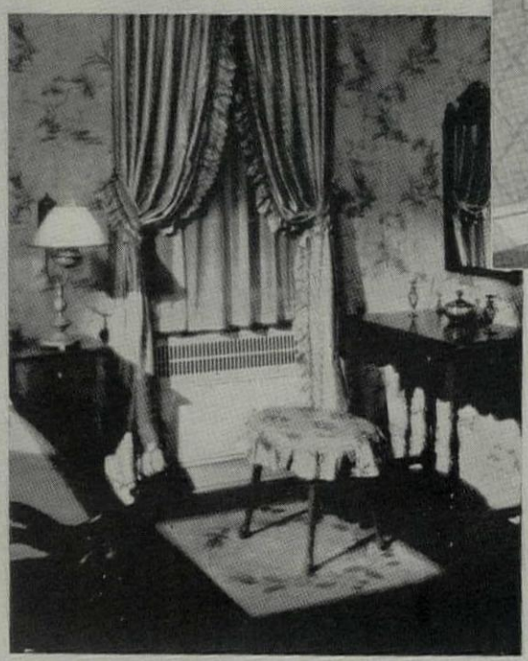
THE TRANE WAY

Phantom view of the Trane Concealed Heater which weighs only one-twentieth as much as the old-fashioned radiator. Ask your architect or heating contractor to tell you more about these remarkable new-type heaters.

* * *

Trane has also won nation-wide recognition in the manufacture of vapor-vacuum heating specialties, unit heaters for space heating, Air-o-lizers for school and office ventilation and blast heater surface for heating, drying, cooling and air conditioning.

HERE is a heater—developed by Trane engineers after years of experience—that replaces old-style radiators and thus removes one of the big obstacles to harmonious interior decoration. These *new-type* Trane heaters furnish *convection* heat which authorities now recognize as more comfortable and more healthful. When concealed in the wall or enclosed in a cabinet, Trane convection heaters supply economical, healthful heat through a natural circulation of warmed air.



INSTANTLY CONTROLLED

TURN KNOB

One of the outstanding advantages of Trane Concealed Convection Heaters is that the heat flow can be started and stopped instantaneously by simply turning a small knob which controls the grille damper. Just open the grille and heat starts to flow instantly. Close the grille and the heat flow stops at once. No waiting for radiators to cool.

HEALTHFUL—COMFORTABLE

NO DRAFTS

Trane Concealed Convection Heat is more healthful and more comfortable because *convection* heat warms only the air you breathe and thus establishes the proper heat balance in your body. *Convection* heat does not produce that uncomfortable "feverish" condition. The room is maintained at a more even temperature—from floor to ceiling. No cold spots. No draft zones. *Comfort throughout!* Good health for all!

CLEAN HEAT

CABINET TYPE

The cleanliness of Trane Convection Heat for homes and offices is a revelation. Curtains stay clean infinitely longer. Streaks and smudges on walls and ceilings are practically eliminated. *Trane heaters are a joy to the housekeeper* because dirt and dust cannot cling to them as to old-fashioned radiators.

DECORATIVE

CONCEALED TYPE

Trane Convection Heaters overcome one of the greatest obstacles of the interior decorator. In the past, decorators have tried to hide cast-iron radiators in various types of cabinets. But this greatly reduces the heat output. Trane engineers designed Trane Convection Heaters expressly to be concealed. They do not mar the beauty of the room.

ECONOMICAL

LARGE BUILDINGS TOO

Best of all, you do not have to pay a premium to have Trane Convection Heaters installed in your home, office or building. A Trane installation is in the price range of old-fashioned radiators. And because of better utilization of the heat generated, Trane Heaters can save from 15% to 25% in fuel. Mail coupon today for catalog which shows artistic interiors in full color.

THE TRANE COMPANY,
Dept. 6, 305 Cameron Ave.,
La Crosse, Wis.

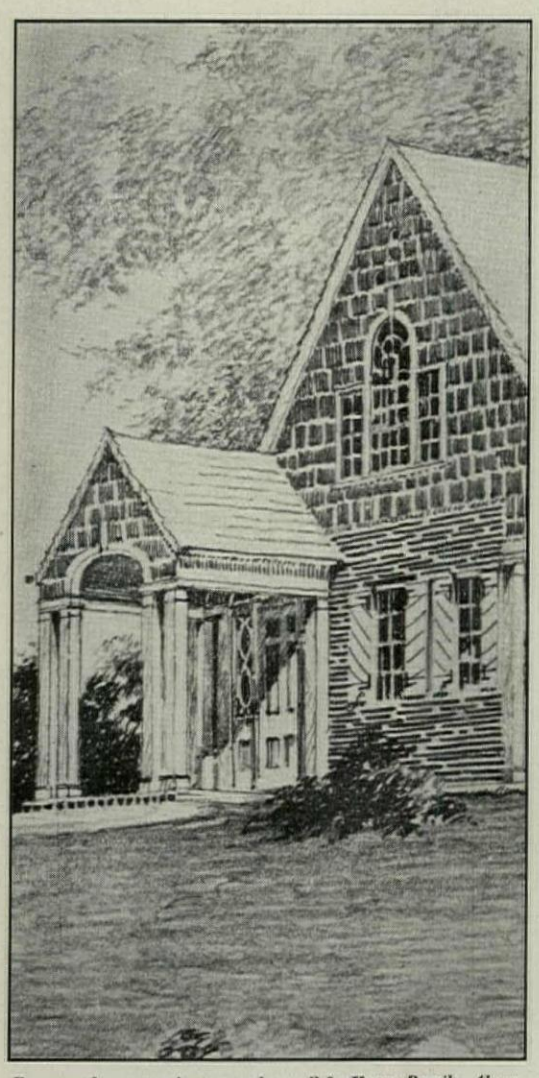
Please send me literature fully describing Trane Concealed Convection Heaters.

Name_____

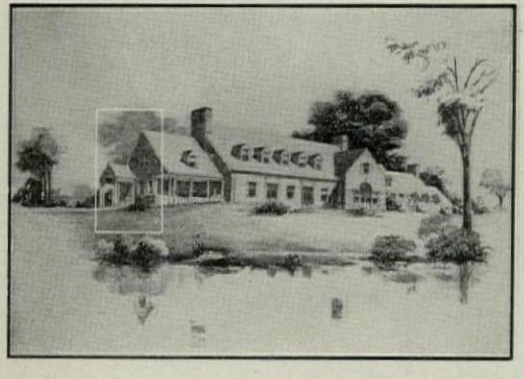
Address_____

City_____ State_____

TRANE CONCEALED CONVECTED HEAT



For example: contrasting tone values call for Venus Pencils. Above is section (below is reduction) of architect's pencil sketch of Short Hills Country Club, Short Hills, N. J. By C. C. Wendehack, architect, New York City, specialist in country club design.



If you've never used Venus erasers, we should like to have you try them. They are better.

Unique Thin Lead Colored Pencils put a complete palette at your finger tips. 24 different colors. Can be sharpened to a fine point. Make wash effects easily.

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.

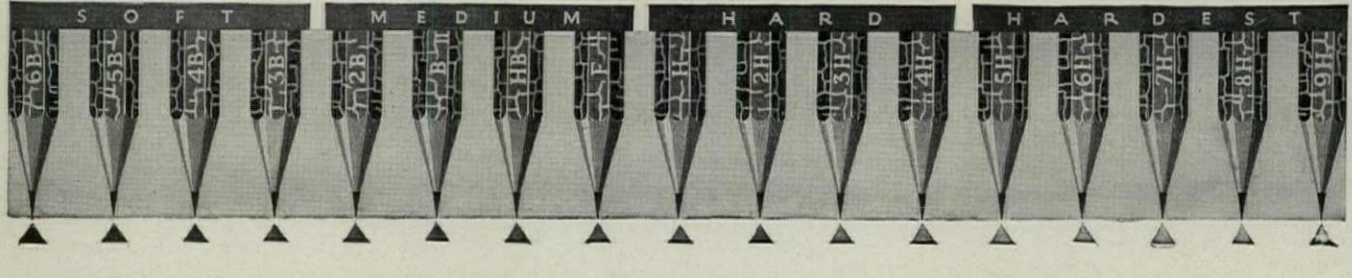
A new feature—you can now tell the grade of a Venus Pencil at a glance. Each has its degree of black stamped on three sides. No matter how the pencil lies on the table, the grade is never hidden.

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

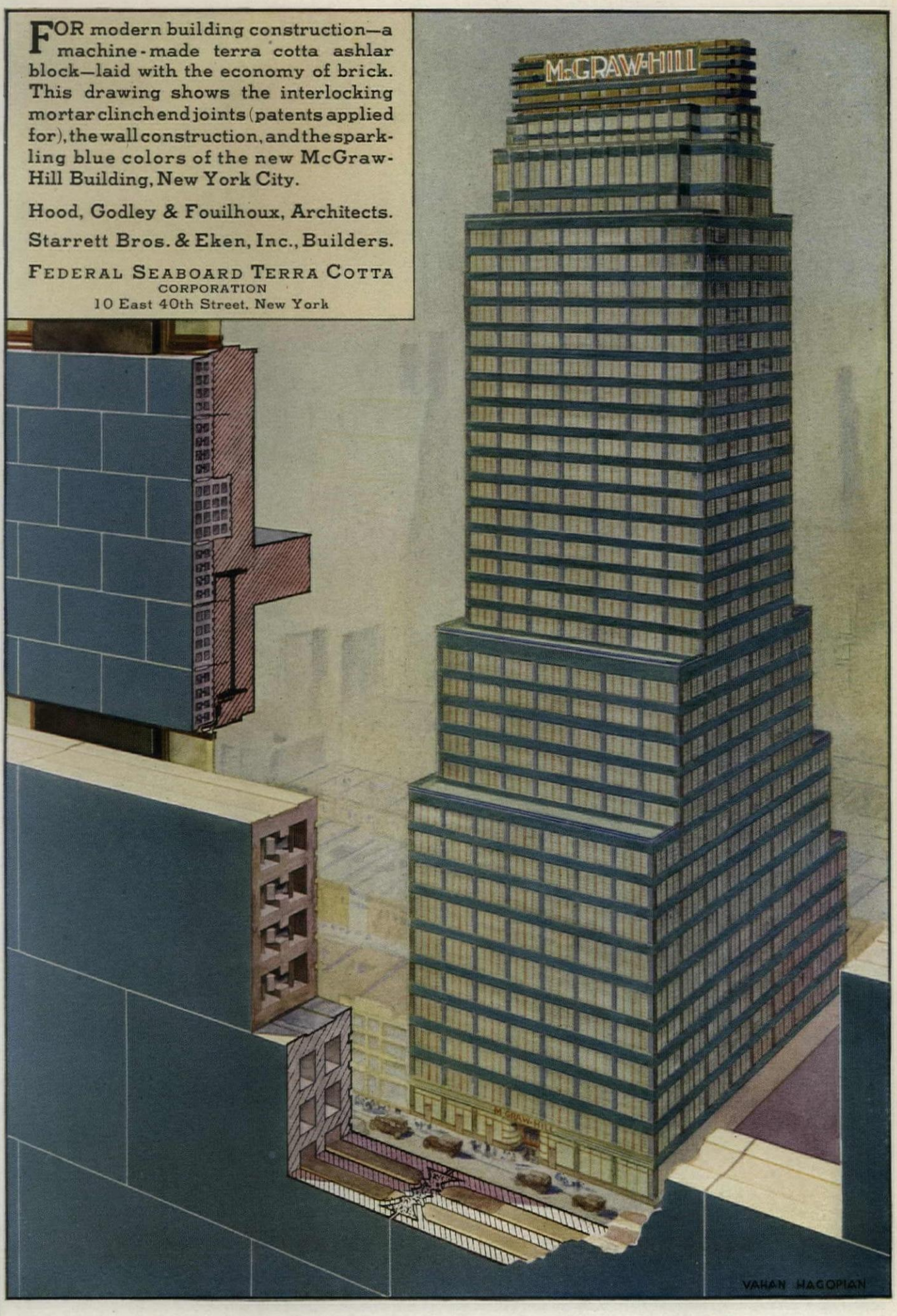


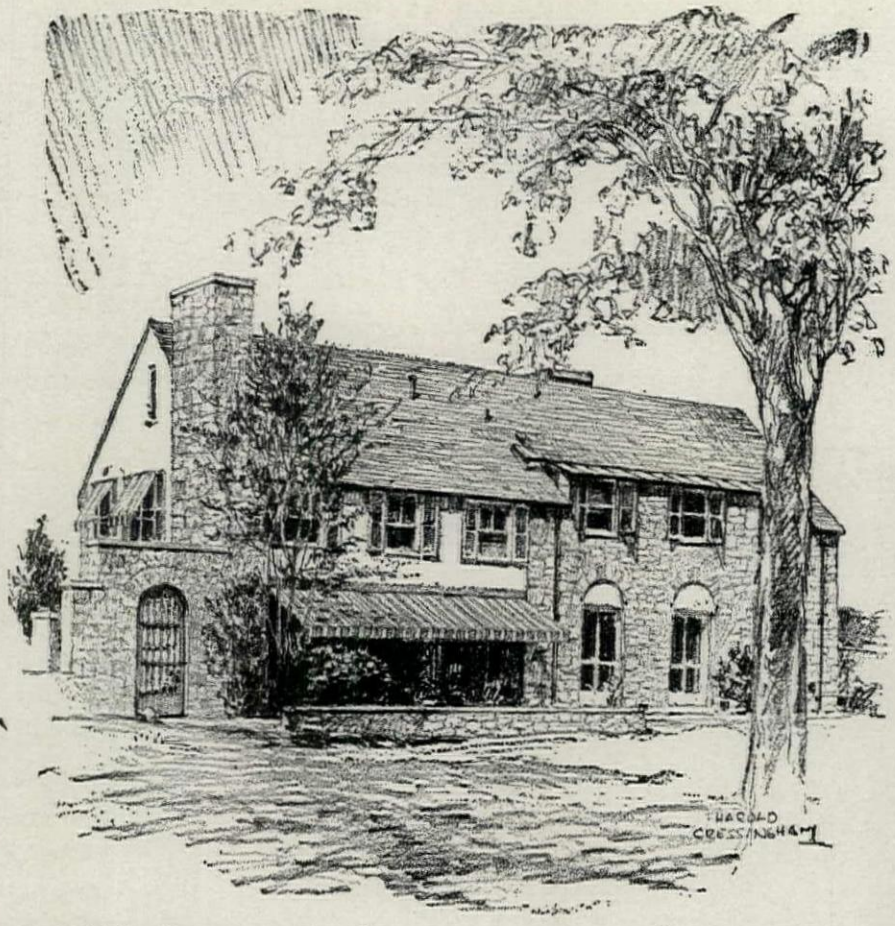
FOR modern building construction—a machine-made terra cotta ashlar block—laid with the economy of brick. This drawing shows the interlocking mortar clinch end joints (patents applied for), the wall construction, and the sparkling blue colors of the new McGraw-Hill Building, New York City.

Hood, Godley & Fouilhoux, Architects.

Starrett Bros. & Eken, Inc., Builders.

FEDERAL SEABOARD TERRA COTTA
CORPORATION
10 East 40th Street, New York





A FAMOUS ARCHITECT *specifies* QUIET MAY for his own home

RAYMOND HOOD—his name and works—are inseparably linked with modern architecture. Thus it was a source of great satisfaction to us when he specified QUIET MAY Automatic Oil Burner for his own home at Southfield Point, Connecticut.

Out of a host of oil burners and other types of heating equipment, Mr. Hood picked QUIET MAY—"Built to Last a Lifetime". In QUIET MAY, Mr. Hood found all the features he sought for in an oil burner.

You are safe when you specify QUIET MAY. QUIET MAY is designed with a maximum "Factor of Safety" in every part and function. During each of the past five years, QUIET MAY Oil Burners, taken from stock, have been run for the equivalent of 72 years of actual home operation.

QUIET MAY Features

Simple design and operation . . . Completely automatic . . . Absolutely quiet . . . Electrically ignited . . . Low fuel oil cost . . . Positive automatic controls . . . Installation outside of furnace . . . Efficient local service . . . Built by financially strong manufacturer.

See Sweet's Catalogue for QUIET MAY Specifications

You'll find complete QUIET MAY specifications in Sweet's Catalogue, Pages D-5245 to D-5256 inclusive. If further information on a particular problem is desired, please write direct to:

MAY OIL BURNER CORPORATION
BALTIMORE MD

QUIET MAY *AUTOMATIC* OIL BURNER

FOR modern building construction—a machine-made terra cotta ashlar block—laid with the economy of brick. This drawing shows the interlocking mortar clinch end joints (patents applied for), the wall construction, and the sparkling blue colors of the new McGraw-Hill Building, New York City.

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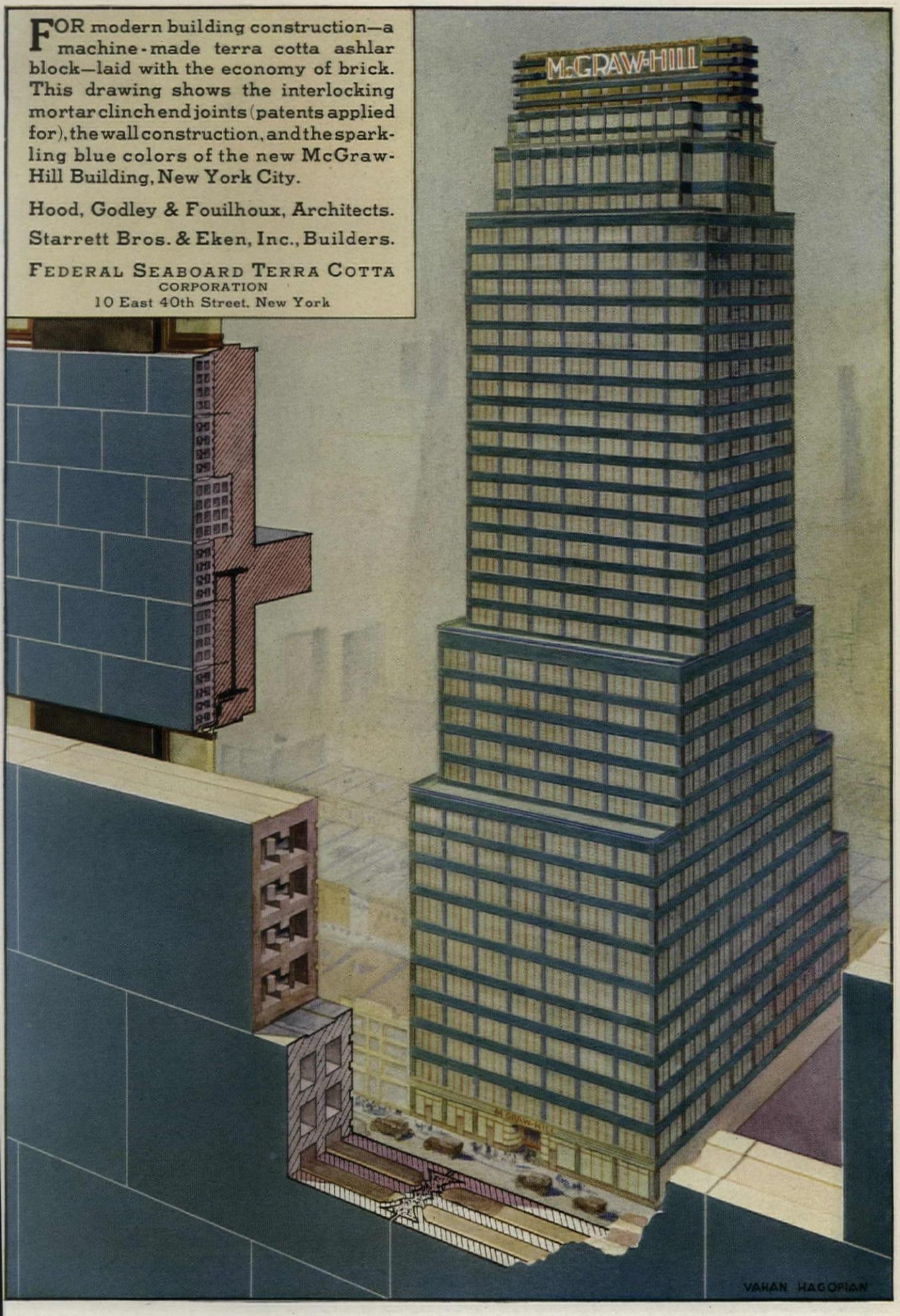
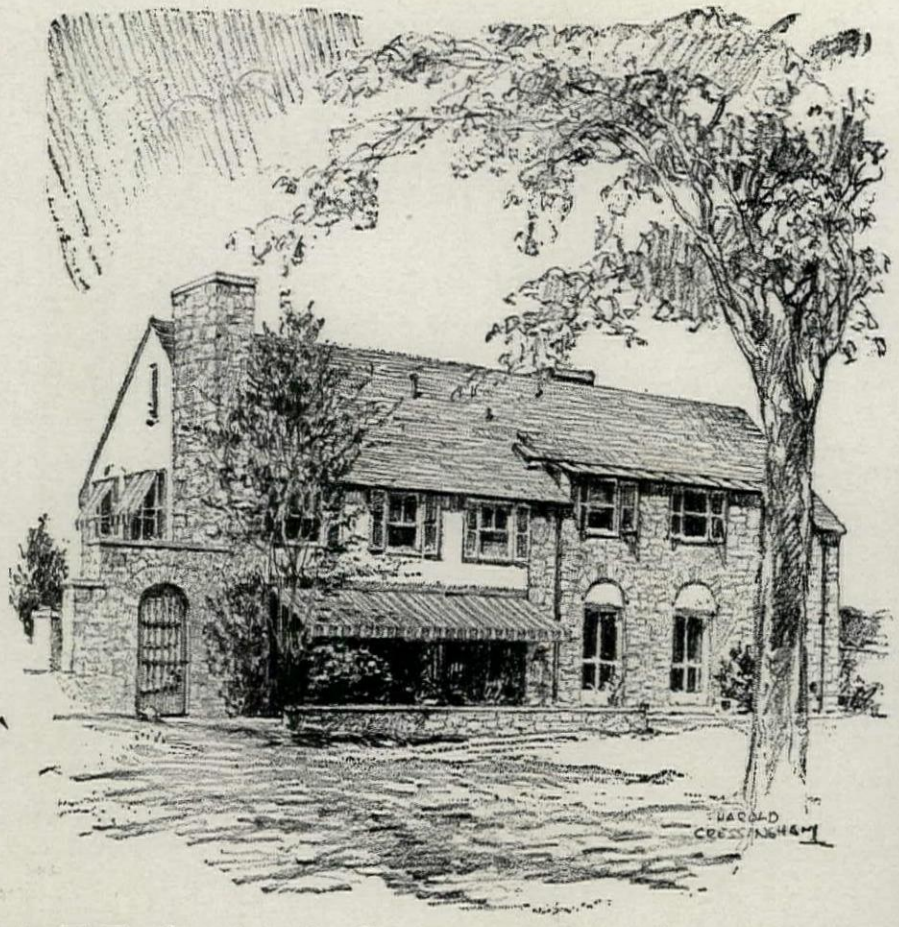
10 East 40th Street, New York





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MAY OIL BURNER CORPORATION
BALTIMORE MD

QUIET MAY *AUTOMATIC* OIL BURNER

FOR PIPE AND CONDUIT....

Specify "Youngstown" for

The Union Industrial Building, Flint, Michigan, in which Youngstown pipe and Youngstown Buckeye Conduit are used exclusively to insure permanence in plumbing, heating and electrical systems.

Architects and Engineers—
SMITH, HINCHMAN & GRYLLS, DETROIT

General Contractors—
REALTY CONSTRUCTION CO. DETROIT

Plumbing, Heating and Ventilating Contractors—
FREYN BROTHERS DETROIT

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LOS ANGELES · 3000 Santa Fe Avenue
MEMPHIS · · · 42 Keel Avenue
MINNEAPOLIS · Andrus Bldg.
NEW ORLEANS · · · Hibernia Building
NEW YORK · 30 Church Street Hudson Terminal Building
PHILADELPHIA · · · Franklin Trust Building
PITTSBURGH · · · Oliver Bldg.
SAN FRANCISCO · · · 55 New Montgomery Street
SEATTLE · · · Central Building
ST. LOUIS · · Louderman Bldg.
YOUNGSTOWN · Stambaugh Building

LONDON REPRESENTATIVE:
The Youngstown Steel Products Company, Dashwood House, Old Broad Street, London, E. C. Eng.

■

GALVANIZED SHEETS PROTECT SAVE WITH STEEL

PERMANENCE

WHEN YOUNGSTOWN STEEL PIPE is specified for plumbing and heating systems, and Youngstown Buckeye Conduit for electrical wiring, there can be no uncertainty as to the permanence of these installations in any building. // Architects the country over, realizing the enduring service afforded by these products, assure this permanence by specifying "Youngstown."

THE YOUNGSTOWN SHEET & TUBE CO.
One of the oldest manufacturers of copper-steel under the well-known and established trade name "Copperoid"
General Offices: Youngstown, Ohio

YOUNGSTOWN

Another

TIGER

Job!

In stately Tower Hall of Girard College, Philadelphia, there is an atmosphere of learning that thrills faculty and alumni with memories of their own university days. An atmosphere of spacious class rooms and inspiring lecture halls where students are now building tradition into its beautiful walls and ceilings that are finished with TIGER . . . the lime that

"Spreads like warm butter"

Achievement of this atmosphere was the basic idea of the creators and constructors of this magnificent tribute to the college youth of America. John A. Windrim was the architect; United Engineers & Constructors, Inc., the general contractors; and George Katz & Co. the plastering contractor who Tiger-finished its attractive interior.

Famous for its remarkable plasticity and smoothness, Tiger White Rock Finish is easily, quickly applied and permits an exceptionally wide latitude for technical artistry.

THE KELLEY ISLAND LIME & TRANSPORT COMPANY
World's Largest Producer of Lime
LEADER BUILDING CLEVELAND, OHIO

The Famous

TIGER

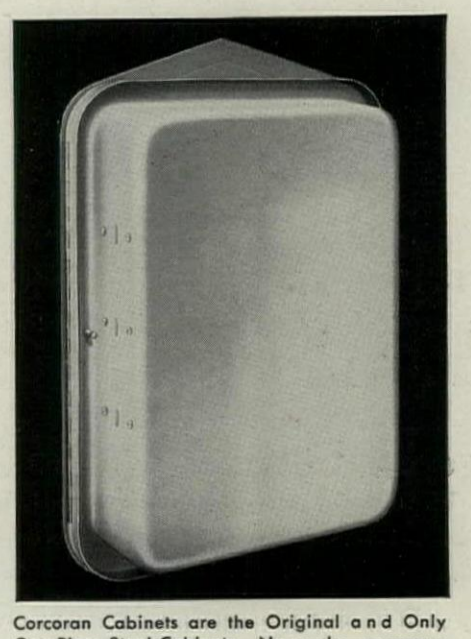
FINISH

AND . . . Tiger Mason's . . . Tiger Agricultural . . . Tiger Chemical . . . Tiger All-Purpose Hydrate in 10-lb. packages . . . . and High Calcium and Magnesium Lump Limes . . . . Also Quickslake (ground quicklime) in paper-lined jute sacks.

When you need CABINETS

Undeniably linked with the foremost development of Bathroom Cabinets is the name "Corcoran". Not yet an old name in the field—as those things go—Corcoran's first cabinet was way in advance of the times. Today's numbers continue to be the leaders.

The expert manufacturing knowledge, advanced mechanical features, and up-to-the-minute designs and styles of this company are yours to summon as an aid in creating economical, yet good looking bathrooms.



Corcoran Cabinets are the Original and Only One-Piece Steel Cabinets. No cracks—no seams—no welded joints—no raw edges. The above photograph illustrates the rounded corners and seamless, jointless cabinet body found only in Corcoran Cabinets.

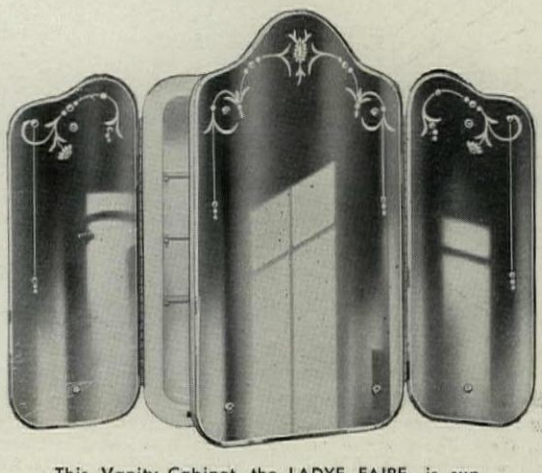
The CORCORAN MFG. CO.

Norwood Dept. PP-731 Cincinnati, Ohio

The 1931 line of Corcoran Cabinets has been broadened and increased to such an extent that this one source of supply is more than sufficient to meet your needs. Catalog sheets showing the newest 1931 models will be furnished on request.

CORCORAN
one piece
Steel Bathroom
CABINETS

Complete cabinet stocks are carried in the following cities:—New York, Chicago, Los Angeles, San Francisco, Montreal, Philadelphia, Baltimore and Dallas.



This Vanity Cabinet, the LADYE FAIRE, is supplied in two sizes. No unsightly space is visible between side wings and center mirror. Hinges and all other metal parts, ordinarily nickel plated, are chromium plated.

CORCORAN

Scientists Translate

Famous Egyptian Papyrus

(Found in the Valley of Kings and recently translated)

"Who the (untranslatable) put that sheet metal canopy over Osiris? Not two years old and rusty already. Feed that (untranslatable) punk to the sacred crocodiles. I told him to use GOHI (pronounced go-high) because I want it to last until 1931."

Pharaoh Dunk-Dunk-Amen, July, B. C. 3002.

• • •

FOR every sheet metal purpose, where durability and workability count, GOHI has definite, outstanding and recognized superiorities.

This famous iron has been developed specifically to meet the requirements of those who demand, in sheet metal, a high degree of resistance to the corrosive influence of soil, weather, and water.

TIME, the unerring testing laboratory, has certified the correctness of the analysis of GOHI — pure iron alloyed with the right amount of copper.

You can use GOHI, secure in the knowledge that it will last, that it is economical and easy to handle, and that it will reflect credit on you and your work. It is the one safe all-purpose sheet metal.

GENUINE OPEN HEARTH IRON
GOHI
TRADE MARK
PURE IRON - COPPER ALLOY
REG. U.S. PAT. OFF.

IT'S THE PURE IRON, ALLOYED WITH THE RIGHT AMOUNT OF COPPER, THAT GIVES GOHI ITS LASTING QUALITIES.

THE NEWPORT ROLLING MILL CO.
NEWPORT, KY.

GOHI

PRONOUNCED "GO-HIGH"

SHEET METAL

Judge grease interception by these 5 POINTS!

ALTHOUGH architects and engineers may never agree in forecasting the problems which may occur in the actual operation of a plumbing system, it is evident that upon the subject of grease interception there is unanimous agreement on one device — Josam-Marsh Grease Interceptor.

This approval, far from being peculiar to any section of the country or among any particular group of architects and engineers, is indicative of the extraordinary efficiency of this device operating under the most unusual conditions. Such wide approval and specification of the Josam-Marsh Grease Interceptor is based upon these five points of superiority:

No water jacket is used to solidify the grease.

Regardless of waste water temperature, Josam-Marsh Grease Interceptors remove ninety-eight per cent of the grease.

Retains only clean, salable grease. Evacuates all solids.

Josam-Marsh Interceptors have no moving parts —nothing to wear out. They are easily installed.

Cost installed is lower—no cold water connections necessary.

Although a comparatively recent development, thousands of the Josam-Marsh Grease Interceptors have been specified and installed. There is a size for every grease intercepting requirement from an apartment house sink to the largest hotel kitchen unit. Also made for industrial use.

Ask the Josam representative in your vicinity for an actual demonstration. You will then comprehend its high efficiency. Write for special portfolio of reliable data on grease interception for your files.

◆

JOSAM MANUFACTURING COMPANY

4908 Euclid Building **Cleveland, Ohio**

Factory: Michigan City, Indiana · Branches in all Principal Cities

The illustration above shows the Interceptor in action and below, the neat appearance. To the left, the component parts are identified.

Josam Marsh GREASE INTERCEPTOR

(a) Inlet; (b) V-Baffle; (c) Flat Baffle; (d) Converging Bottom Ribs; (e) Converging Side Wall Ribs; (f) Outlet; (g) Channel to Outlet; (h) Outlet Pipe Connection; (i) Vent Connection and Cleanout; (j) Seal Wall Separating Outlet and Body of Interceptor.

We will welcome inquiries regarding the use and installation of the Josam Products listed below taken from Catalog G: 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-Marsh Shock Absorbers for pipe lines; Josam Open Seat Back Water Sewer Valves; Josam Open Seat Swing Check Valves; Josam Adjustable Closet Outlet Connections and Bends, Water and Gas-Tight.

Josam TRADE MARK REG. PRODUCTS
STANDARD OF AMERICA

SEE OUR Catalogue in SWEETS

JOSAM PRODUCTS ARE SOLD BY ALL PLUMBING AND HEATING SUPPLY WHOLESALERS

THERE ARE NO SUBSTITUTES FOR JOSAM PRODUCTS

INSULATION *plus* FIREPROOFING

. . . . at no extra cost in this economical insulation board

HERE is a truly remarkable building material: an insulating board that not only provides insulation from summer heat and winter cold, but in addition, gives extra protection from the ever-present fire menace. Thermax turns back fire as easily as heat. It is the only fireproofing insulation board or building unit. Made of treated wood and minerals, Thermax possesses all the desirable features of an ideal building material. It has lightness with structural strength, and can be sawed and nailed like wood. Sufficient thickness to assure positive insulation can be obtained in a single layer of Thermax—yet Thermax is surprisingly low in cost. Write for specification data and sample.

4 PROVABLE FACTS ABOUT THERMAX

1. **Insulation:** Thermax combines real insulation with fireproofing; qualifications possessed by no other insulation board.
2. **Fireproofing:** Thermax, tested in accordance with the standard fire test specifications of the American Society for Testing Materials, meets requirements for Class A fireproof construction.
3. **Structurally Strong:** Thermax satisfies code requirements for self-supporting insulated roof decks, and non-bearing partitions.
4. **Sound-Deadening:** Thermax 2-inch partitions transmit less than one-fifth of one per cent of sound.

THERMAX

Insulation *plus* Fireproofing

THERMAX CORPORATION, Dept. K
228 North La Salle Street, Chicago, Ill.

Gentlemen: Please send me specification data and sample of Thermax.

Name.....

Address.....

NEW—

a Portfolio of Modern Grille Designs

EACH year there is a constantly increasing demand for punched grilles. This has been brought about by the extensive use of air conditioning and ventilating systems, as well as recessed radiation. In addition, Architects have evidenced a demand for new and original grille designs which can be executed in white metals. It is realized that few, if any, of the old designs should be used in these bright metal grilles.

To provide ourselves with just such material we sponsored a grille design contest which has brought us the ideas of brilliant designers from all parts of the country. With the winning designs as a foundation our skillful designers have adapted them to practical use.

Prize Winning Designs

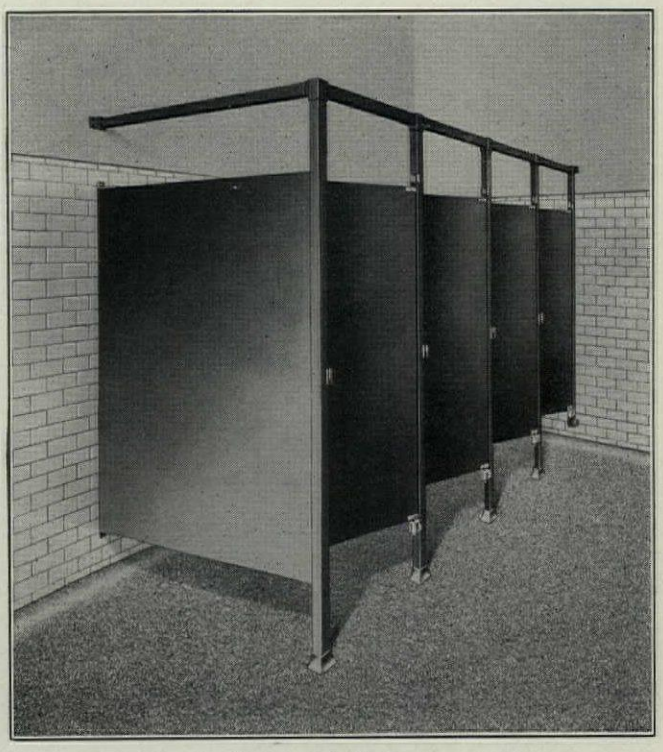
We are pleased to offer to Architects a Portfolio of these prize winning designs with adaptations available for immediate use. These new designs will be of great assistance to the Architect when planning wall surfaces in the modern manner.

Sent *without charge*

This Portfolio of Modern Grille Designs will be sent to reputable Architects who write us on their firm stationery.

The HARRINGTON & KING Perforating Co.

New York Office, 114 Liberty Street
5648 Fillmore Street, Chicago, Illinois



Consider These New Flush Partitions

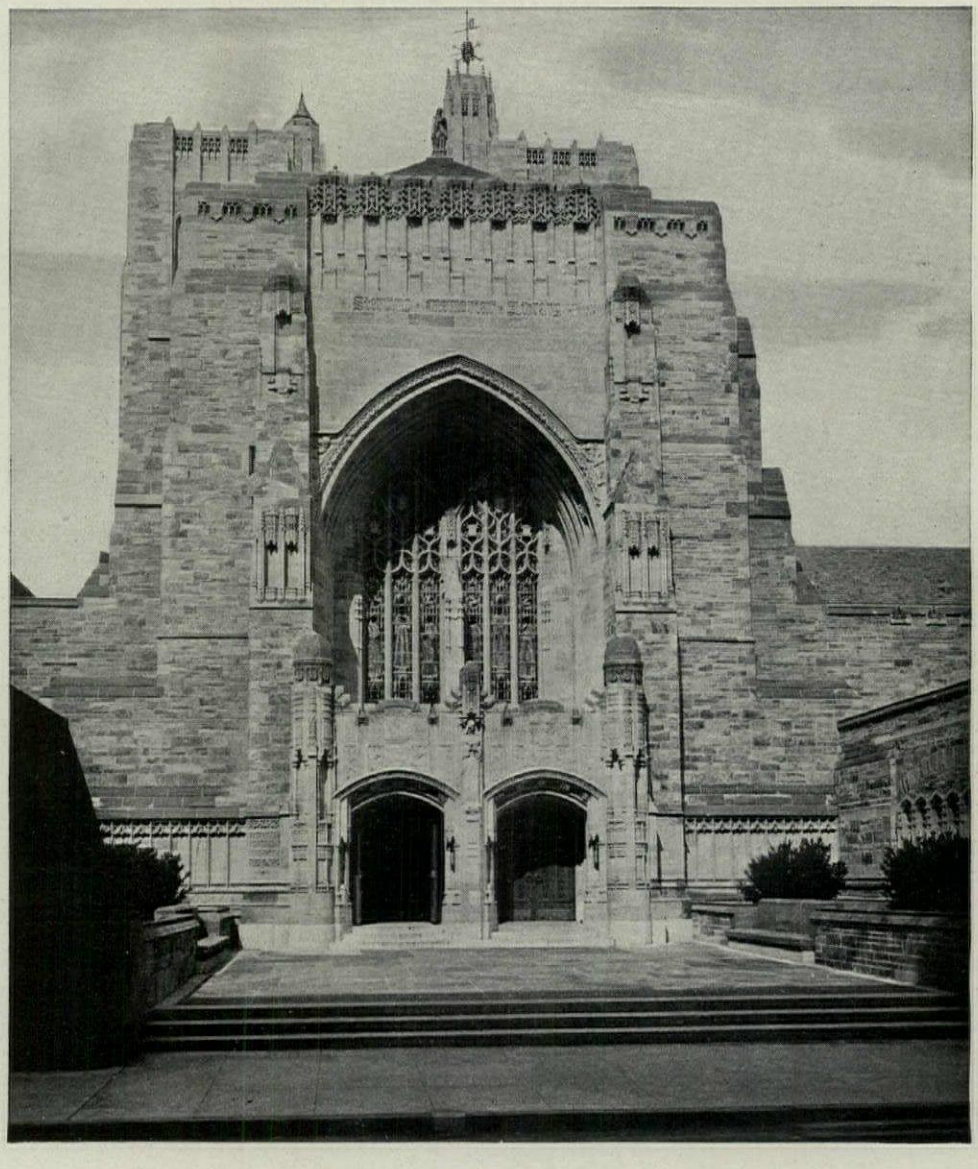
If you haven't already considered the advantages of Flush WEISTEEL Compartments, turin now to the Weis catalog in *Sweet's*, beginnng at page B-2921 and study the features of design and construction. Flush WEISTEEL Compartments combine the durability and price advantage of steel with the characteristics usually found in buildings where more expensive materials are used. Partitions and doors are one inch thick and there are no seams or raw edges anywhere. These new partitions are the product of an organization which, for fifty-five years, has been engaged in producing metal building products of the highest quality. With this reputation behind them you can be sure of complete satisfaction from Flush WEISTEEL Partitions.

Henry Weis Mfg. Co., Inc.

Established 1876

ELKHART, INDIANA

WEISTEEL



Entrance, Sterling Memorial Library, Yale University, New Haven, Conn.

Newest of Yale University's many imposing new buildings is beautiful Sterling Memorial Library, housing 2,000,000 volumes and with accommodations for 2,000 readers. Its architect: James Gamble Rogers. Its most prized possession: a Gutenberg Bible. Its floors: W. & J. Sloane Battleship Linoleum.

W. & J. SLOANE LINOLEUM

THIS DATA BOOK WILL PROVE MOST HELPFUL WHEN SPECIFYING LINOLEUM FLOORS

WE SHALL GLADLY SEND YOU A COPY ON REQUEST.
W. & J. SLOANE, 577 FIFTH AVE., N. Y.

Harborview Hospital, Seattle, Washington. Thomas, Grainger & Thomas, Architects. L·O·F Safety Glass used on fifth floor (psychopathic wards)—all other glazing Libbey·Owens·Ford "A" Quality Flat Drawn Clear Sheet Glass.

A Monument to the Great Northwest

This hospital stands as a testimonial to the architectural genius and to the spirit of the great Northwest.

Beautiful in its simplicity—indispensable in its service, it embodies the finest in purpose—in design and in materials.

Libbey·Owens·Ford glass is used throughout the building.

Libbey·Owens·Ford flat drawn sheet glass is known for its fine brilliance—its clarity—and its lasting beauty. L·O·F Safety Glass is synonymous with safety wherever glass is employed.

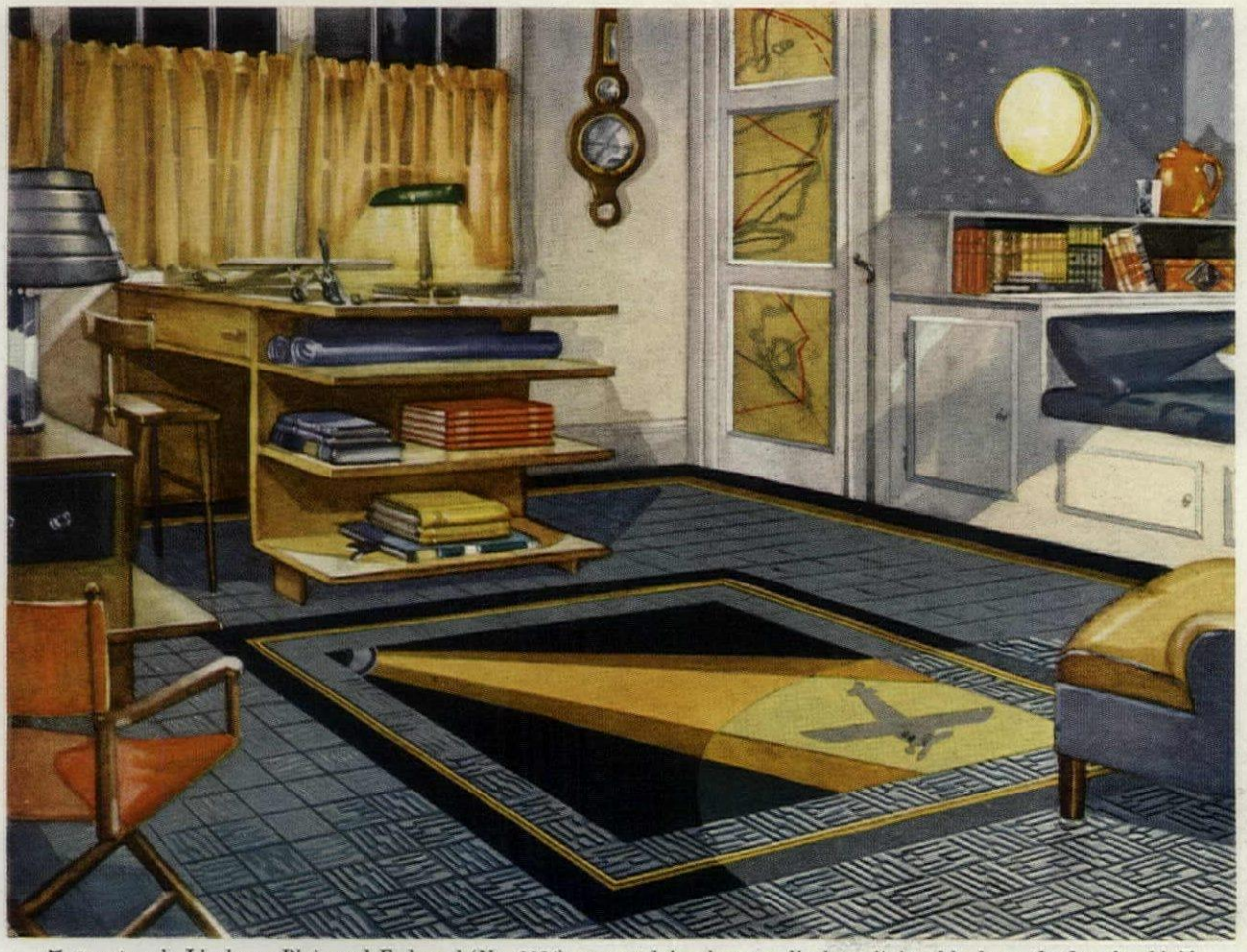
LIBBEY·OWENS·FORD GLASS COMPANY, TOLEDO, OHIO

Manufacturers of Polished Plate Glass, Flat Drawn Clear Sheet Glass and Shatterproof Safety Glass; also distributors of Figured and Wire Glass manufactured by the Blue Ridge Glass Corporation of Kingsport, Tennessee.

IN LIBBEY·OWENS·FORD NATIONAL ADVERTISEMENTS THE READER IS INSTRUCTED TO CONSULT HIS ARCHITECT

LIBBEY·OWENS·FORD

flat drawn clear SHEET GLASS



Armstrong's Linoleum, Plain and Embossed (No. 3221), cemented in place over linoleum lining felt, forms the floor for this air-minded room. Insets such as that above can be made up in any design.

With no other floor material...

could the architect completely capture the spirit of a room like this

TWO air-minded young Americans will thank the architect who designed this room. Every detail is in tune with the spirit of flight. Even the floor says "Happy Landings!" to a pair of venturesome young airmen.

Surely no boy could ask for a more attractive room! Mother appreciates it, too. She knows that ordinary boy accidents, even spilled ink, will not harm the easy-to-clean floor. And for the architect there's the pleasure that comes of solving an old problem in a new way. With the added thought that quite possibly his design for this one room helped sell the plans for the entire house.

Something of the spirit of this room would be lost if it were not for the floor's colorful design. Armstrong's Embossed Inlaid Linoleum forms the background, with a unique center panel of original design cut from several plain colors.

Sample designs free. You'll find a modern Armstrong's Linoleum Floor to fit any interior scheme. We will gladly send you our new file-sized specification book. We are in Sweet's, too. Address Armstrong Cork Company, Floor Division, Lancaster, Pa. (Makers of cork products since 1860)

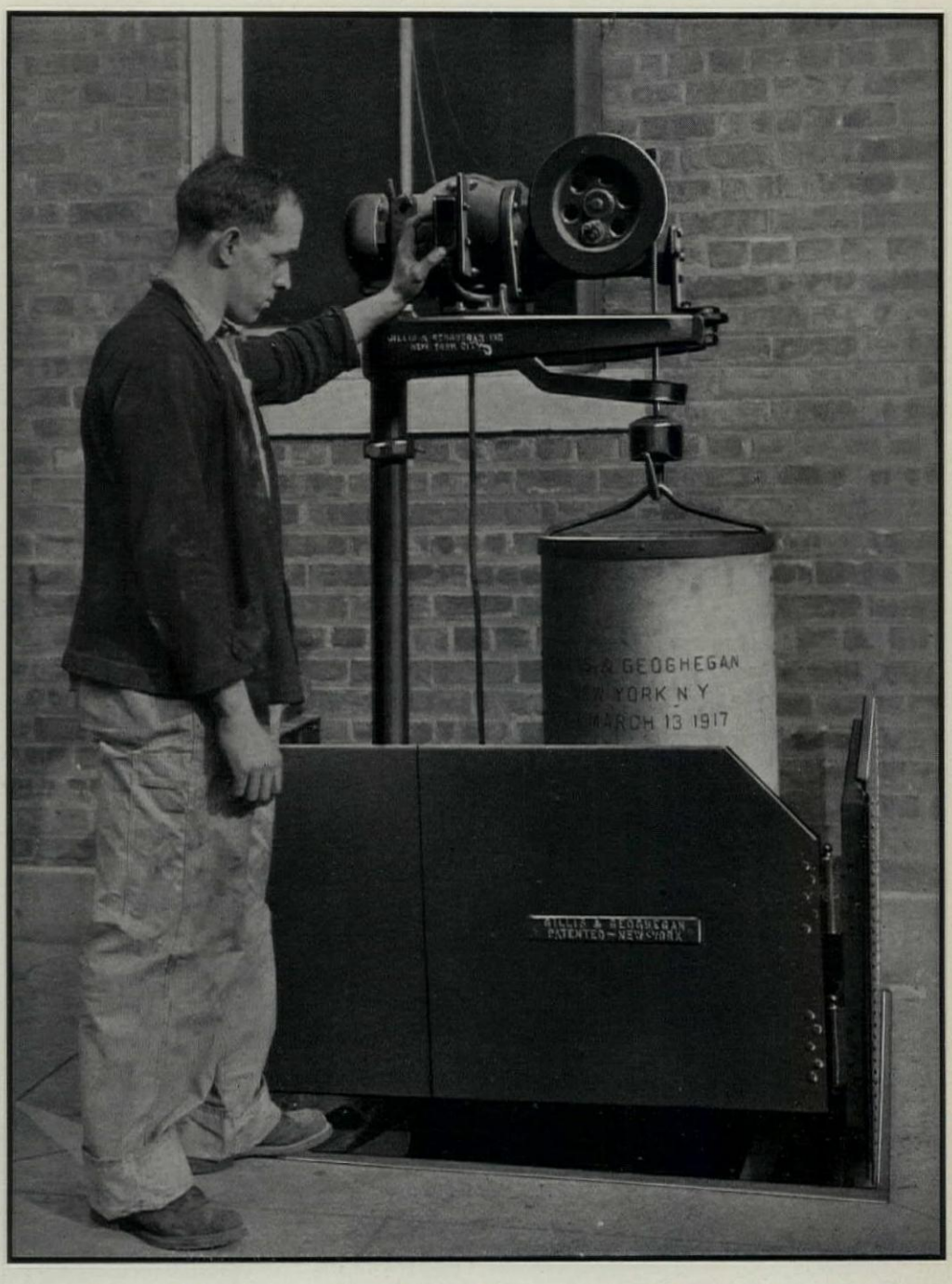
Armstrong's (A) Product

Armstrong's Linosets, of which this is No. 2, can be made up to your individual design in many color combinations.

Armstrong's Linoleum Floors

for every room in the house

PLAIN · INLAID · EMBOSSED · JASPÉ · PRINTED · ARMSTRONG'S LINOTILE *and* CORK TILE



Announcing — NEW MODELS AT LOWER PRICES

G&G ELECTRICALLY operated Hoists for the removal of ashes, garbage and rubbish are now available in new models, grade level type or truck-dumping type with overhead crane, at attractively lower prices . . . . It is now possible to purchase a G&G Electric Hoist completely equipped with G&G Sidewalk Doors, Swing Guard Gate, and G&G Automatic Door Opening-Closing-Locking Device at only a slight advance over a good hand power hoist with complete equipment . . . . G&G Telescopic Hoists, both electric and hand power, are in use in 2072 schools, 623 banks, 597 office buildings, 206 Bell Telephone Buildings, and many other classes of buildings.

Catalogue in Sweet's Archt. Cat., 1931 Ed., pp. D6342-49
In Canada, see Specification Data

The G&G ELECTRIC Telescopic Hoist
With Automatic Stop and Gravity Lowering Device

GILLIS & GEOGHEGAN

548 WEST BROADWAY - NEW YORK, N. Y.

Von Duprin

Self-Releasing Fire and Panic Exit Latches

The Golden Investment

When you specify Von Duprin devices you are making, on behalf of your client, the finest type of investment that can be made.

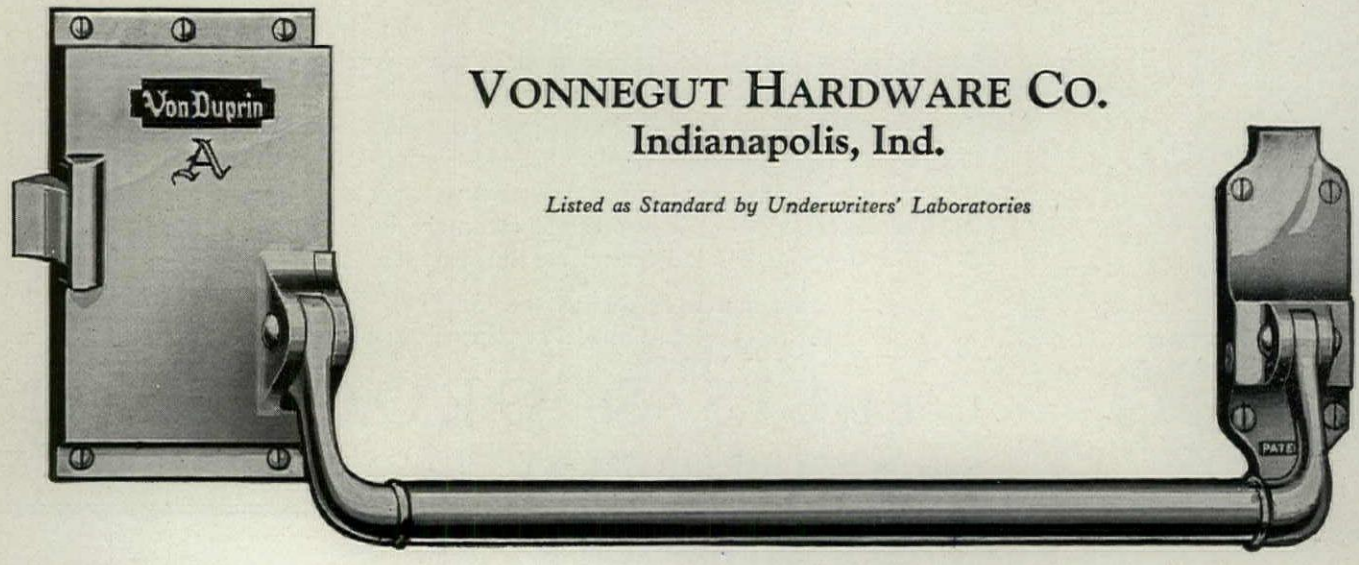
You are buying both satisfaction and sure profit.

You are making it possible for him to rest content in the knowledge that the occupants of the building are protected by the best known safeguard against panic fatalities, that everything possible has been done to make safe exit certain at all times.

You are securing for him a goodly profit in the practical elimination of upkeep expense over the life of the devices. He will invest more in Von Duprins than he might otherwise spend, but his cost per year will be far less.

To make sure of getting Von Duprin devices, we suggest that you specify them by name and as an item separate from the finishing hardware. *Thus you foster clean competition, since all reputable dealers can buy them at the same fair prices.*

Catalog 28V shows a Von Duprin device for every purse and every purpose. Or see Sweet's, Pages C3892-C3896.



VONNEGUT HARDWARE CO.
Indianapolis, Ind.

Listed as Standard by Underwriters' Laboratories

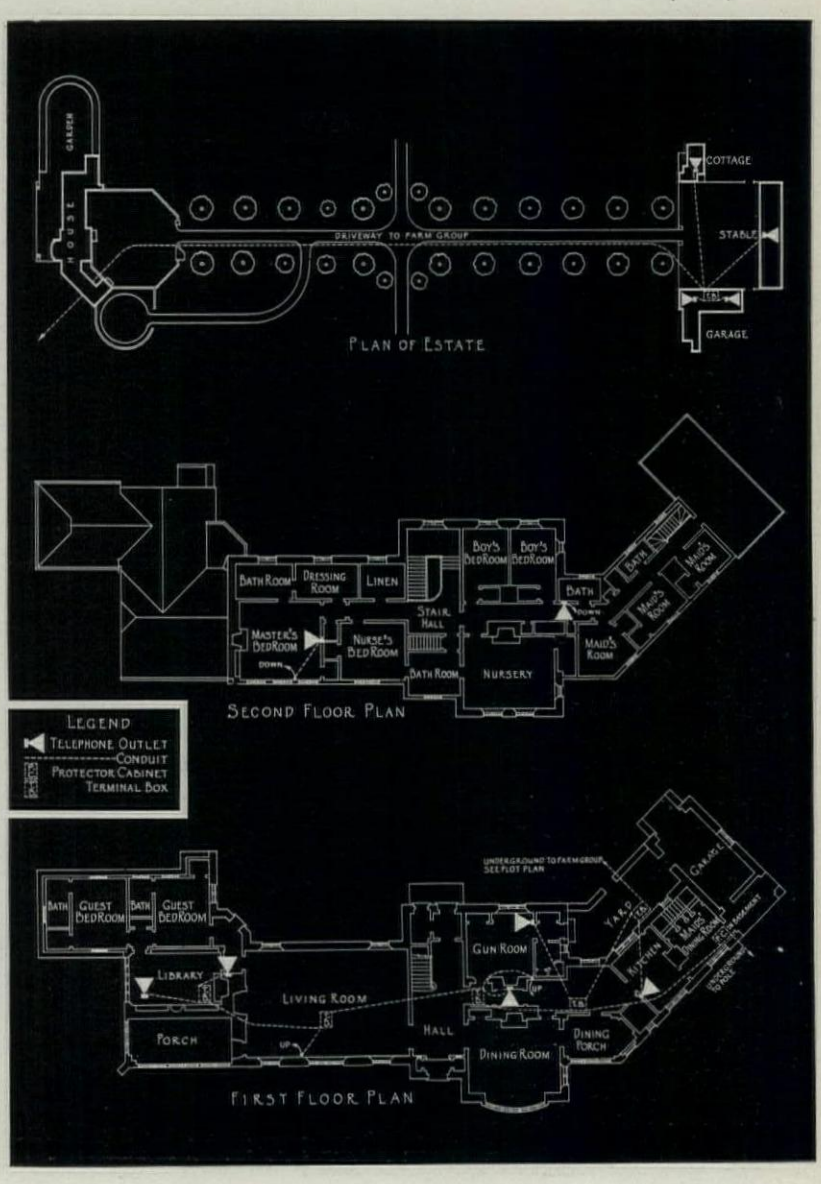
Built-in conduit and eleven telephone outlets provide for telephone convenience on the estate of Mrs. Henry A. Rudkin, Fairfield, Connecticut. There are seven outlets in the main residence, two in the garage, and one each in the stable and gardener's cottage. Underground conduit is laid between the buildings as shown on the plot plan below. A Bell intercommunicating system connects all four buildings with each other and with the outside world. WALTER B. KIRBY, Architect, *New York City.*

PLANNING BUILT-IN TELEPHONE CONVENIENCE FOR THE LARGE ESTATE

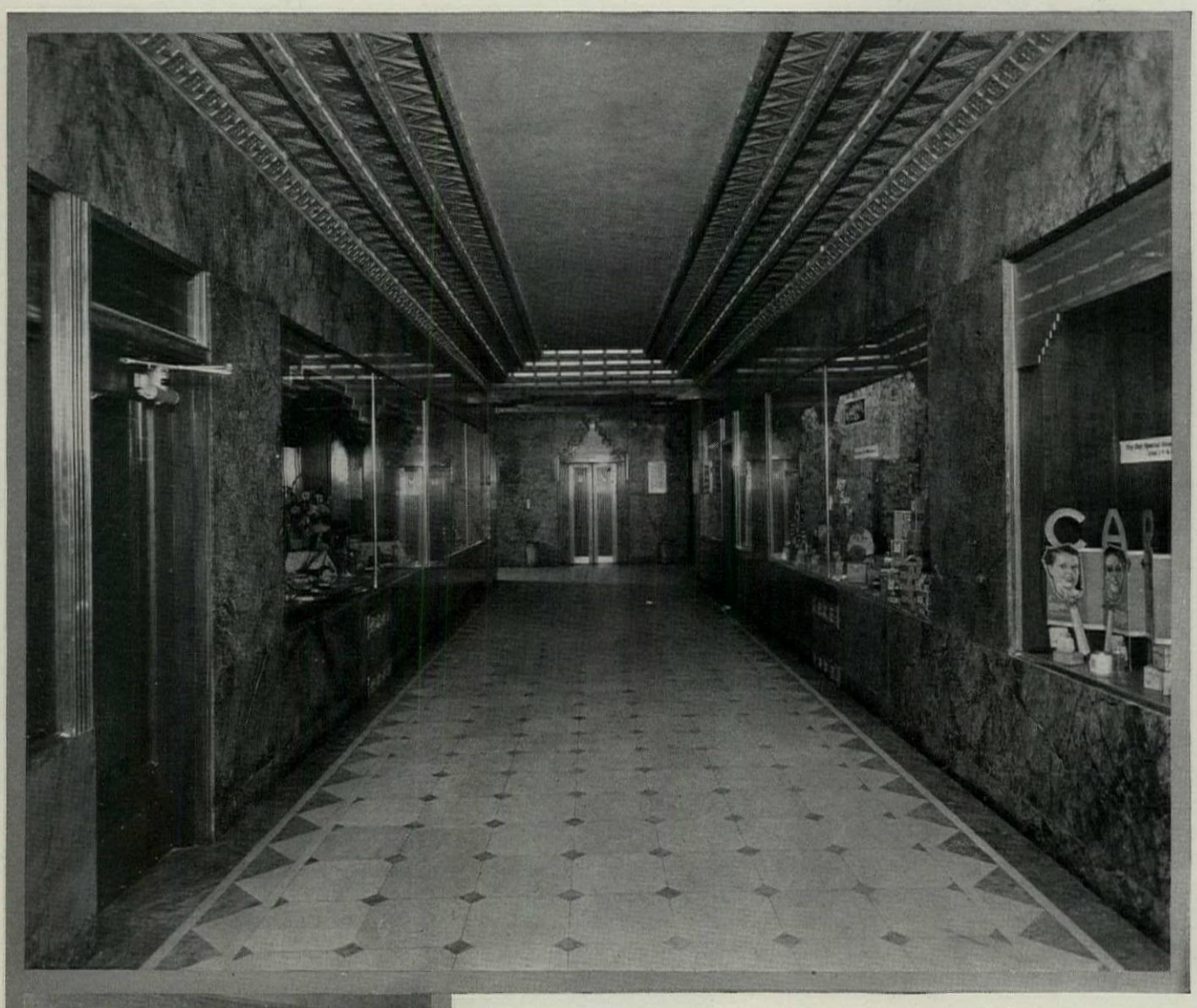
TELEPHONE convenience, on the large estate, is best achieved by careful planning in advance. Often the main residence requires communication from room to room and there are distant outbuildings with which direct communication is also desirable. All such calls can be handled as simply as ordinary calls to the outside world—and over the same Bell telephones.

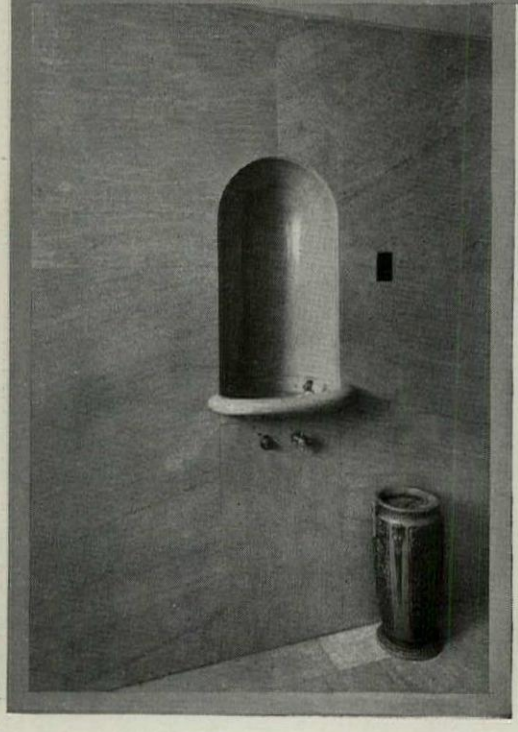
Let your local telephone company help you provide for this kind of convenience. They'll explain the Bell intercommunicating system best adapted to your project. They'll help you plan a layout for telephone conduit, which, built into walls and floors and run underground between buildings, conceals all wiring, protects against certain types of service interruptions and permits telephone outlets to be located wherever they are most convenient.

This advisory service saves you time and assures lasting telephone satisfaction to your clients. There is no charge. Just call the Business Office.



GEORGIA MARBLE





INTERIOR MARBLE WORK

THIS is an example of interior marble work furnished and erected by The Georgia Marble Company. *Above*—Entrance and elevator foyer; the walls from floor to ceiling, the floor border and dots, are Georgia Verde Antique; and the floor *field* is Anderson Pink Tennessee. *Left*—Typical detail, public corridors above street floor; walls, floors, and drinking fountains are Anderson Pink Tennessee Marble.

Our manufacturing operations extend beyond working the marble from our own quarries in Georgia . . . . We take contracts for both exterior and interior marble work in any combination of marbles necessary to carry out the architect's design and color scheme.

Two interior views of THE SINCLAIR BUILDING, Ft. Worth, Texas. W. G. Clarkson & Company, *Archts.*, R. O. Dulaney and Associates, *Owners*, Harry B. Friedman, *Contractor.*

THE GEORGIA MARBLE CO. • TATE • GEORGIA

NEW YORK ATLANTA CHICAGO DALLAS CLEVELAND

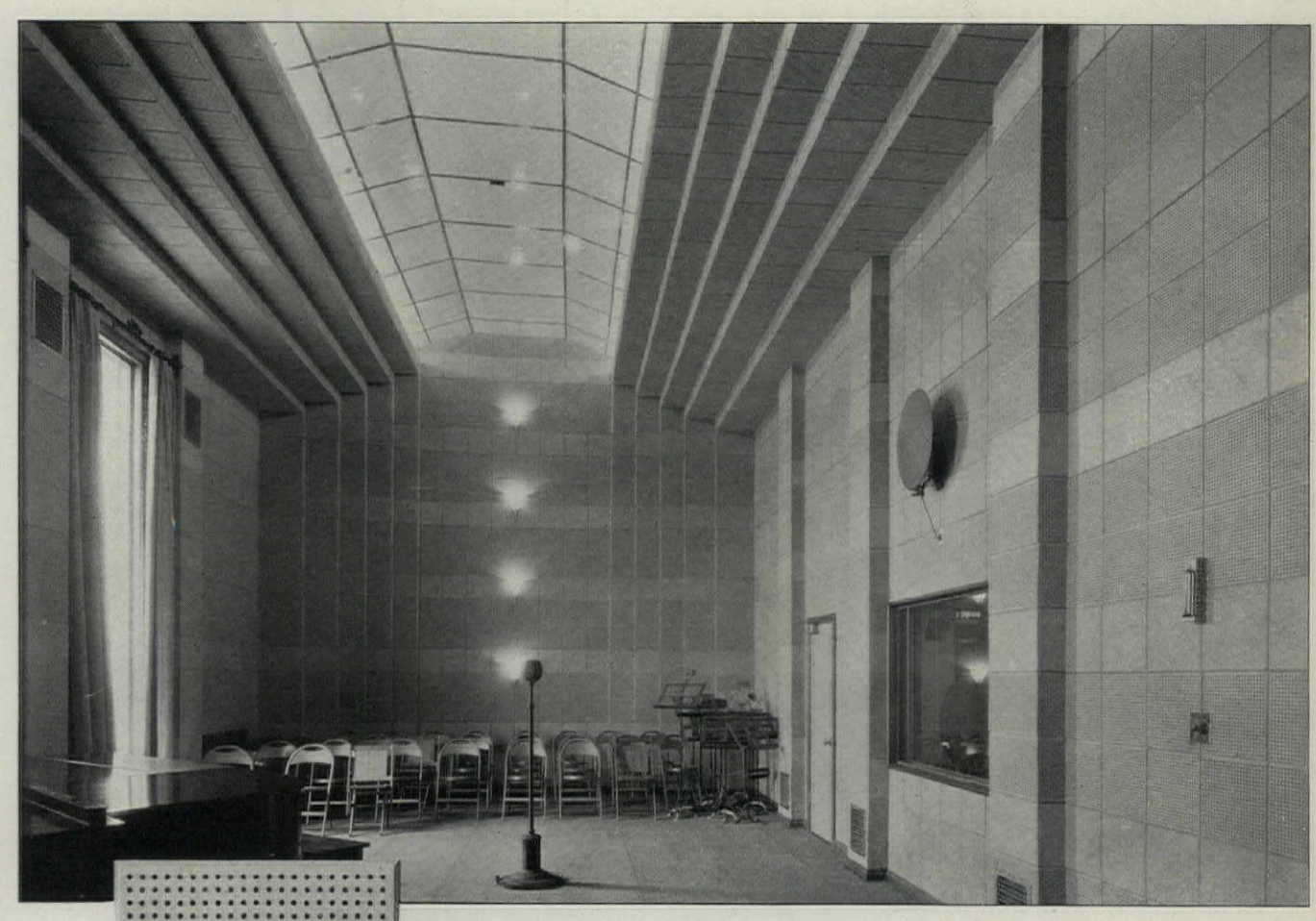
EXPRESSING THE *Modern* WITH ACOUSTI-CELOTEX

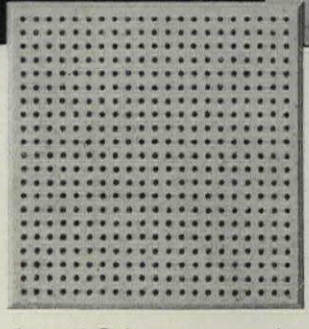
THE primary purpose of Acousti-Celotex here was to provide correct broadcasting acoustics.

Actually, however, it went beyond this. For the Acousti-Celotex tiles were a distinct aid in carrying out the modernistic design of this attractive studio.

The KEJK Studio is but one example of the adaptability of Acousti-Celotex sound absorbing tiles to various designs.

KEJK Radio Studio, Beverly Hills, California. Carl Lindbom, Architect. 2500 sq. ft. of Type B Acousti-Celotex used.





Acousti-Celotex tiles may be applied to plastered surfaces or directly to joists. The deep perforations permit repeated painting with any kind of paint. Send for descriptive booklet.

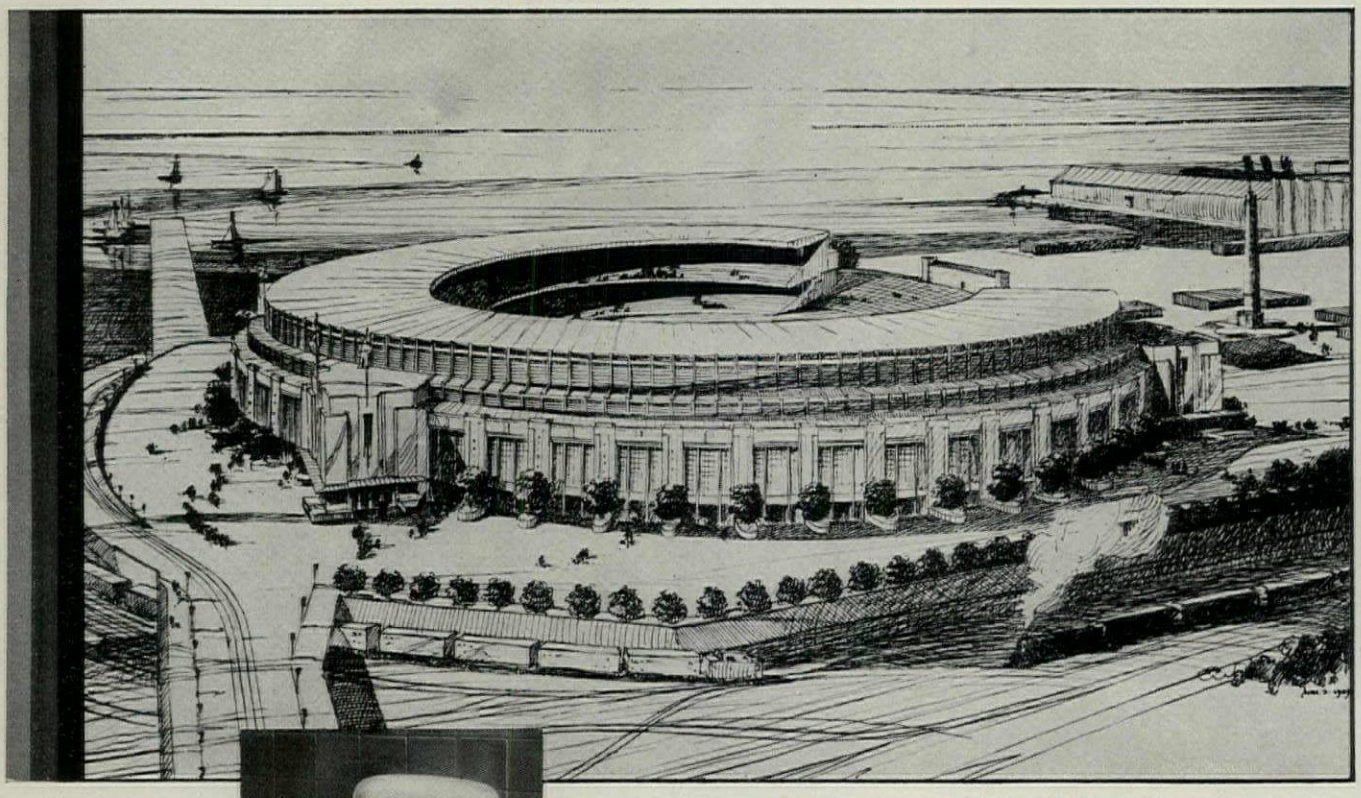
Exquisite decorative effects are also possible with this acoustical material, for Acousti-Celotex can be decorated repeatedly with any kind of paint without impairing in the least its sound absorbing value.

The Celotex Company, 919 North Michigan Avenue, Chicago, Illinois. In Canada: Alexander Murray & Co., Ltd., Montreal. Sales distributors throughout the World. Sold and installed by Acousti-Celotex contracting engineers.

ACOUSTI-CELOTEX

FOR LESS NOISE—BETTER HEARING

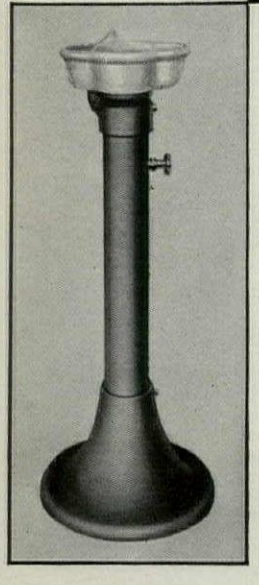
When Stribling and Schmeling meet at Cleveland . . .



Municipal Stadium
Cleveland, O.

Walker & Weeks
Architects

The Osborn Company
Engineers



No. 601, (wall type) and No. 520-600 (pedestal type) were the fountains specified in The Stadium. Exclusive Halsey Taylor features . . . automatic stream control, two-stream projector and freedom from servicing troubles . . . help protect the city's investment as well as the public health.

. . . fight fans will drink from Halsey Taylor Fountains

IN this majestic new sports arena, located in Cleveland, Ohio, a huge crowd will assemble in July to see another championship decided. And as fistic fans turn their eyes not only on the great sport event but on the beauty and splendor of this new stadium they will see a safeguard to health in the installation of Halsey Taylor Drinking Fountains, *the specification for sanitation.* . . . . The Halsey W. Taylor Company, Warren, Ohio.

HALSEY TAYLOR

Drinking Fountains

FROM BEGINNING TO END

The Manufacture of High Grade

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is characterized by the use of correct materials, properly processed by modern methods and experienced craftsmen, under skilled technical supervision.

AMERICAN Products are supplied in Black and Galvanized Sheets, Formed Roofing and Siding Products, Special Sheets, Tin and Terne Plates for all purposes. When maximum rust-resistance is an important factor, use KEYSTONE Copper Steel. Also write for full information on

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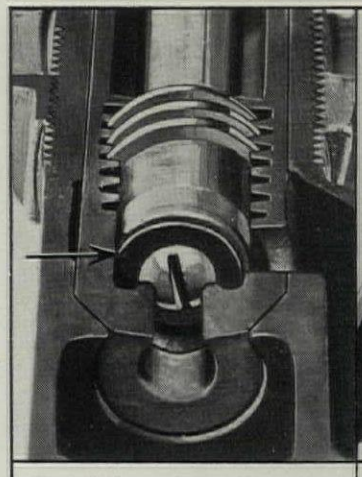
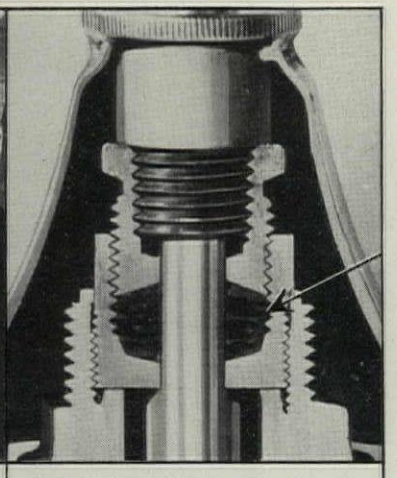
INSIDE FACTS ABOUT FITTINGS

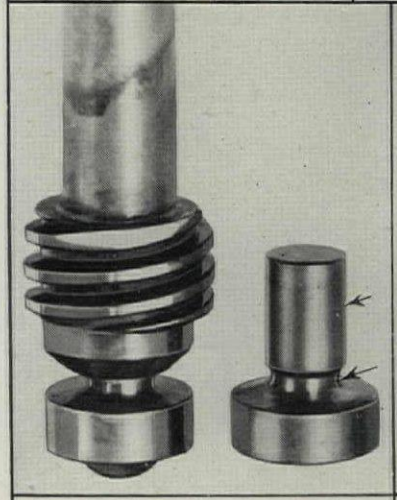
THAT MAKE AN ARCHITECT'S WORK SIMPLER, SURER



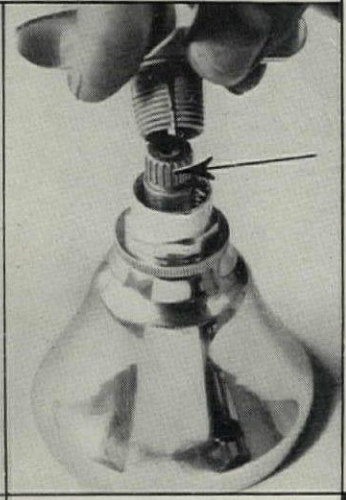
Encased disc washers make a water-tight joint. The washers are made of a hard, non-swelling composition.



Only the best and most serviceable packing available is used in Kohler valves. One of many details that make efficiency.



The swivel disc on Kohler valves has a long shank extending ½" into the heavy stem, which means quiet action.



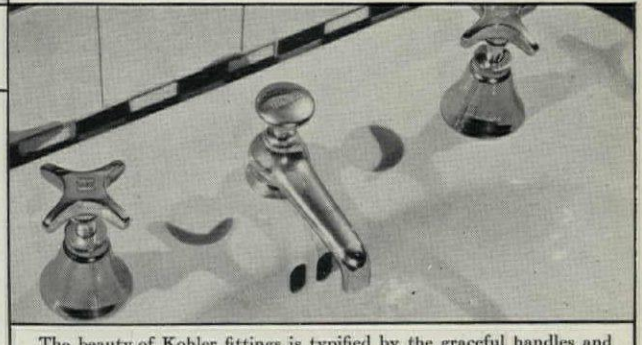
Interchangeable handles on Kohler fittings are splined to eliminate troublesome top or side screws.

YOUR association with the client isn't over, by a good deal, when the last fixture and fitting have been put in. Trouble-shooting wastes time, wastes money, does no good to reputations. The best way and the safe way is to find out for yourself which fittings are right, and *stay* right, and then use them in writing your plans.

Here are some of the reasons why so many architects are sticklers about Kohler fittings on all jobs, large and small. First, Kohler fittings are made of real red brass, containing an extra amount of virgin copper. Pick up a Kohler spout or faucet. Notice its weight. Extra metal, plus hair-breadth accuracy in manufacture, means deep threads that are always in mesh, water-tight joints, cleaner castings, and a smoother surface.

You may have discovered, too, how much the clear, smooth finish of Kohler fittings, their character and style, do to keep clients satisfied. Kohler chromium on all cast brass pieces is applied directly to the metal itself. No undercoating of nickel or copper causes the chromium to peel. The plating is thicker, more uniform—more durable, and easy to clean.

Another thing to notice about Kohler fittings is the lack of gadgets and useless ornament. . . . Handles turn quickly, easily, at the touch of the fingers. Spouts swing from the top of the yokes. Kohler Co. *Founded* 1873. Kohler, Wis. Manufacturers of Kohler Electric Lighting Plants. *Branches in principal cities.*



The beauty of Kohler fittings is typified by the graceful handles and the forceful, flowing lines of the escutcheons.

KOHLER OF KOHLER

PLUMBING FIXTURES AND FITTINGS

Eliel Saarinen's San Antonio Address

In *The Octagon* for April there appeared a verbatim report of an address by Eliel Saarinen, delivered at the Sixty-fourth Annual Convention of the American Institute of Architects, which we wish every architect and draftsman could read in its entirety. Just as an appetizer, we are going to quote here some parts of his address, which seems to us to be one of the sanest utterances concerning contemporary architecture we have yet heard or read.

After discussing the art of the past and coming to the conclusion that "*Each of those great cultural epochs has had creative power to build its culture in an expressive style of its own through a fine sense for its fundamental form,*" he goes on,

. . . . if we compare our attempts to develop a contemporary architecture of today with those great epochs of the past, we have to ask: Does the fundamental form of our day conduct our movement, or do we still wander in darkness? Where do we find our leaders?

The same question is asked in other arts. Who is the leader of Music today? Is it Debussy? Is it Stravinsky? Is it Sibelius? In painting we have had in a few decades impressionists, symbolists, pointilists, cubists and so on. Each one thought it had found the key of the time. We have Cézanne and Picasso. Many say that Picasso is the greatest painter of today. Maybe. Maybe he will found the painting of the future. Or maybe his influence is gone in a few years, a few decades.

Maybe there will appear some day a strong mind which will go deep into things, and the doors will open for the painting of the future. Maybe the same will happen in the art of building! Only the future can tell.

"But," says someone, "why all this talking about deep thinking? Our time is practical! We have to build in a practical way. Practicality has to decide the form of our architecture. If a building is practical, it is beautiful." This is what they say.

But I wonder! I wonder if it is so, because we so often see very, very practical buildings, practical from every angle, practical in every point, and they appear so terribly ugly. They have no proportions, no rhythm, no balance of masses. The color is terrible, the treatment of materials is terrible. So, I don't think we can say that if a building is practical it is beautiful.

But, I think we can say—or rather—I *do think* we *should* say that *a building has to be practical to be able to be beautiful.* And further: *A practical building is able to be beautiful only if the architect has a subconscious sense for beauty*, that is: if he is a creative artist.

Is the practical really so especial a mark of our age as we think? We are inclined to think so when we see what they had in the earlier days. But it seems to me that they were more practical than we are, because they could get along with lesser needs. And on the other hand, we do not know what the future holds for our practicality. Maybe then it will be said: They were not practical at all. They used gasoline in their cars, just as in the old kerosene lamps! Why couldn't they take the power directly from the air as we do?

Every age has its own point of view regarding practicality. Practicality is one of the corner stones of all architecture, has always been and always will be so. Nature is our teacher in the principles of architecture, and nature itself is the perfect functionalism.

When we speak about practicality, we mostly think about our daily comfort. We push a button here and a button there, we get cold here and hot there, and that is all very practical. But we do not live for our daily comfort. We have higher ideals. And the very man who preaches the coldest and hardest practicality is not always practical himself. He plants roses in his garden. Why roses? Roses are not practical. Cabbage is more practical.

Then, after tracing the development of traditional design into its ultimate state of imitation of the past without logic or meaning, Saarinen continues:—

And I ask: Is this our tradition? Are we going to build our contemporary architecture on forms that do not mean anything?

No!!!

If we have to find our tradition from our ancestors, we have to go to a time when *art was still creative art*, in the Greek architecture and the Gothic time.

But what is our tradition and what is our wisdom from the Greek architecture?

The Greek architects tell us: "Our tradition comes from Egypt. They had a dualistic construction, the support and the weight, the column and the architrave. We used this principle because it was practical for our purpose. But they had their own fundamental form. It would have been easy for us to use their form, but it would have been a lie. *Art has to speak truth as well as man has!* So we had to use our own fundamental form and develop through it a style of our own.

"Our architecture has been admired for thousands of years because it is truthful in form and truthful in expression.

"This is our advice to you and this is your tradition from our art:

"*Be truthful in form and expression*, and the future will admire your work."

The Gothic architects tell us: "Our tradition comes through the Romanesque and through the Christian architecture from old Rome. We accepted the Roman plan form because it was practical for our purpose. We found the pointed arch in the Orient and we adopted it because it was practical for our high windows. But we had our own fundamental form, and it governed our architecture. Look at our lofty vaults and buttresses; look at our high towers. The whole is a logical organism; it rises from the bottom to the top, stone built upon stone. You can feel the power go through the material and you can follow the power line the whole way to the top. It is truthful in material and truthful in construction and therefore our architecture has been admired for centuries.

"This is our advice to you and this is your tradition from our art:

"*Be truthful in material and construction* and the future will admire your work.

"*Be truthful in form and in expression.*

"*Be truthful in material and in construction. This is our tradition and this is our ethics.*"

There is more. We think your effort will be repaid if you seek out the April *Octagon* and read it all.

RIVERSIDE CHURCH
NEW YORK CITY

HENRY C. PELTON, ALLEN & COLLENS
Architects

A Masonry Acoustic Installation

GOOD ACOUSTICS—was considered and the problem was solved by the use of AKOUSTOLITH sound absorbing artificial stone on the clerestory walls and for the Cast AKOUSTOLITH ribs and soffits to the ceiling vaults.

PERMANENCY OF CONSTRUCTION—in harmony with this great Cathedral Church was achieved by the use of Timbrel Tile ceiling vaults—all masonry—with AKOUSTOLITH finish soffits.

AKOUSTOLITH can be furnished with sound absorption up to 60% at 512 vibrations according to Bureau of Standards Tests.

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PENCIL POINTS

An Illustrated Monthly JOURNAL for the DRAFTING ROOM *Edited by* RUSSELL F. WHITEHEAD

KENNETH REID & E. L. CLEAVER *Published by* THE PENCIL POINTS PRESS, INC.

Ralph Reinhold, *President*, L. F. Nellis, *Vice-President*, William V. Montgomery, *Secretary*

This Month and Next

Our frontispiece this month shows a drypoint by William C. McNulty who is rapidly gaining recognition among printmakers who are recording the contemporary city. We regret that our reproduction does not do full justice to the original and suggest that those of our readers who are interested in prints take the trouble to visit some convenient print shop where they can examine at close range this and other specimens of Mr. McNulty's art. Though not trained as an architect, the artist shows in all his work an appreciation of the picturesque effects brought about sometimes by the accidental juxtapositions of building masses which occur so commonly in our big cities. Next month's subject will be an etching by Gerald K. Geerlings, a good deal of whose work has already been published in our pages. Mr. Geerlings is at present abroad continuing his studies at the Royal School of Etching and Engraving.

The lead-off article next month will be on the work of the late Harrison Clarke of Los Angeles, an architect and artist whose loss has been keenly felt by the profession on the west coast. We have reproduced many of his finest drawings, including two in color, and feel sure that our readers will be inspired by his ability as a sympathetic delineator of architecture. The article was written by Robert D. Murray to whom thanks are due for gathering together the collection of drawings illustrated. Regular PENCIL POINTERS will remember his article on Robert Lockwood in the July, 1930, issue.

Ernest Irving Freese, Part 17 of whose Geometry series appears in this issue, will continue his discussion of "Geomathematics" next month in Part 18. We hope that many of our readers are following his series closely and are sure that those who do will develop their all around drafting room technique and increase their value to themselves and to their employers. There seems to be some divergence of opinion regarding this series. Some men think it a waste of time but an equal number seem to feel that it is very much worth while. Several have even gone so far as to write us that the series is one of the most valuable we have ever published. We suspect that the old rule of compensation applies here and that the men who put in the necessary time and effort to learn what Mr. Freese has taken so much pains to impart get a whole lot out of it while those who superficially skim through it or are scared off by the apparent intricacy of the author's demonstrations get nothing. What do *you* think? Both the author and the editors would like to know.

Contents

For July, 1931

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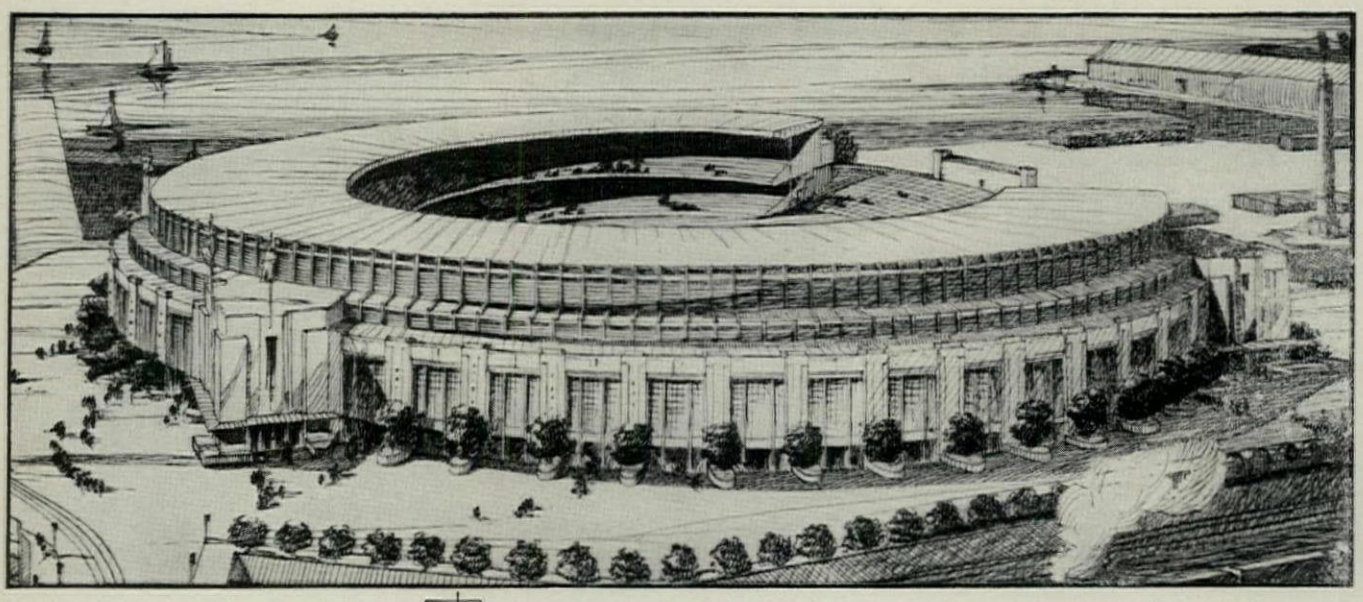
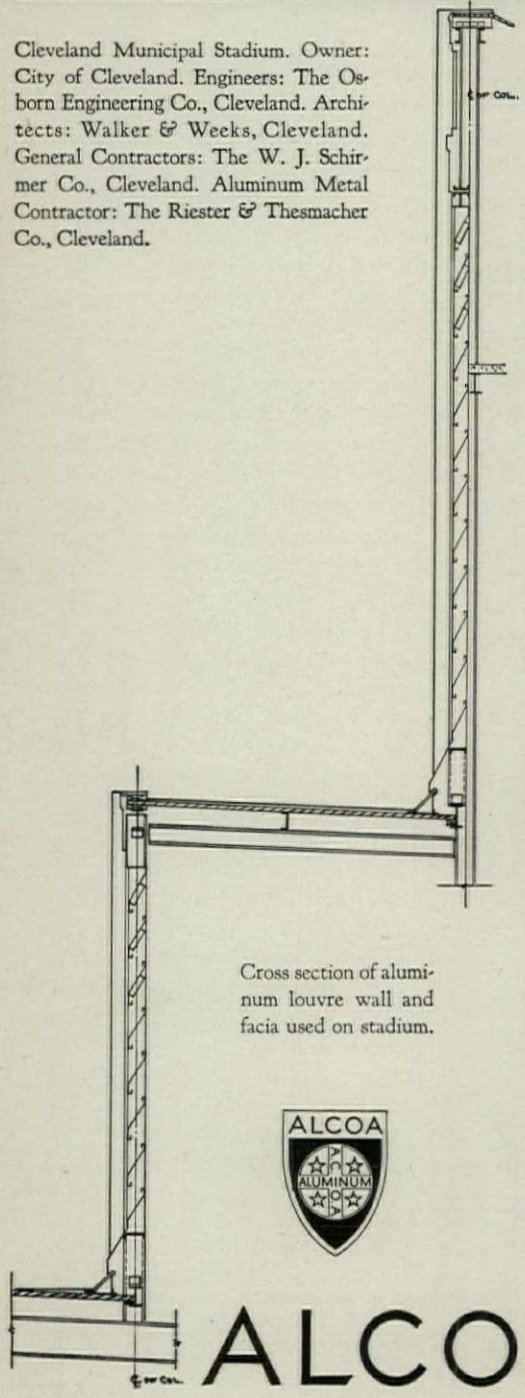
PENCIL POINTS is indexed regularly in *The Art Index*



Cleveland Municipal Stadium. Owner: City of Cleveland. Engineers: The Osborn Engineering Co., Cleveland. Architects: Walker & Weeks, Cleveland. General Contractors: The W. J. Schirmer Co., Cleveland. Aluminum Metal Contractor: The Riester & Thesmacher Co., Cleveland.



Cross section of aluminum louvre wall and facia used on stadium.

What neither Olympia nor Athens could do

Gold and ivory statues by Phidias stood close to that stately stadium at Olympia. Pentelic marble was used for seats in the magnificent stadium at Athens. And yet, with all its classic design and prodigal use of marble and precious metals, Greece never built a stadium to include all the comforts, conveniences and structural advantages present in the Cleveland Municipal Stadium where approximately 180,000 square feet of Alcoa Aluminum are used.

Unknown to ancient Greece, almost unknown to building construction ten years ago, there is no other one metal today that is rightly more popular for certain architectural uses than Alcoa Aluminum. In the Cleveland Stadium, corrosion-resisting Alcoa Aluminum alloys are used for the frieze outside and inside the horseshoe; for the entire faces of the two set-backs with louvres; for the four marquise; for the grandstand ends; for the facia of the lower tier; for ornamental lighting fixtures, flagpoles and scoreboard. Almost every form of Alcoa Aluminum is used: sheet, screws, nuts, bolts, rivets, paint, extruded shapes, plates and castings. Approximately 180,000 sq. ft. of Alcoa Aluminum add permanence, appearance and economy to this structure.

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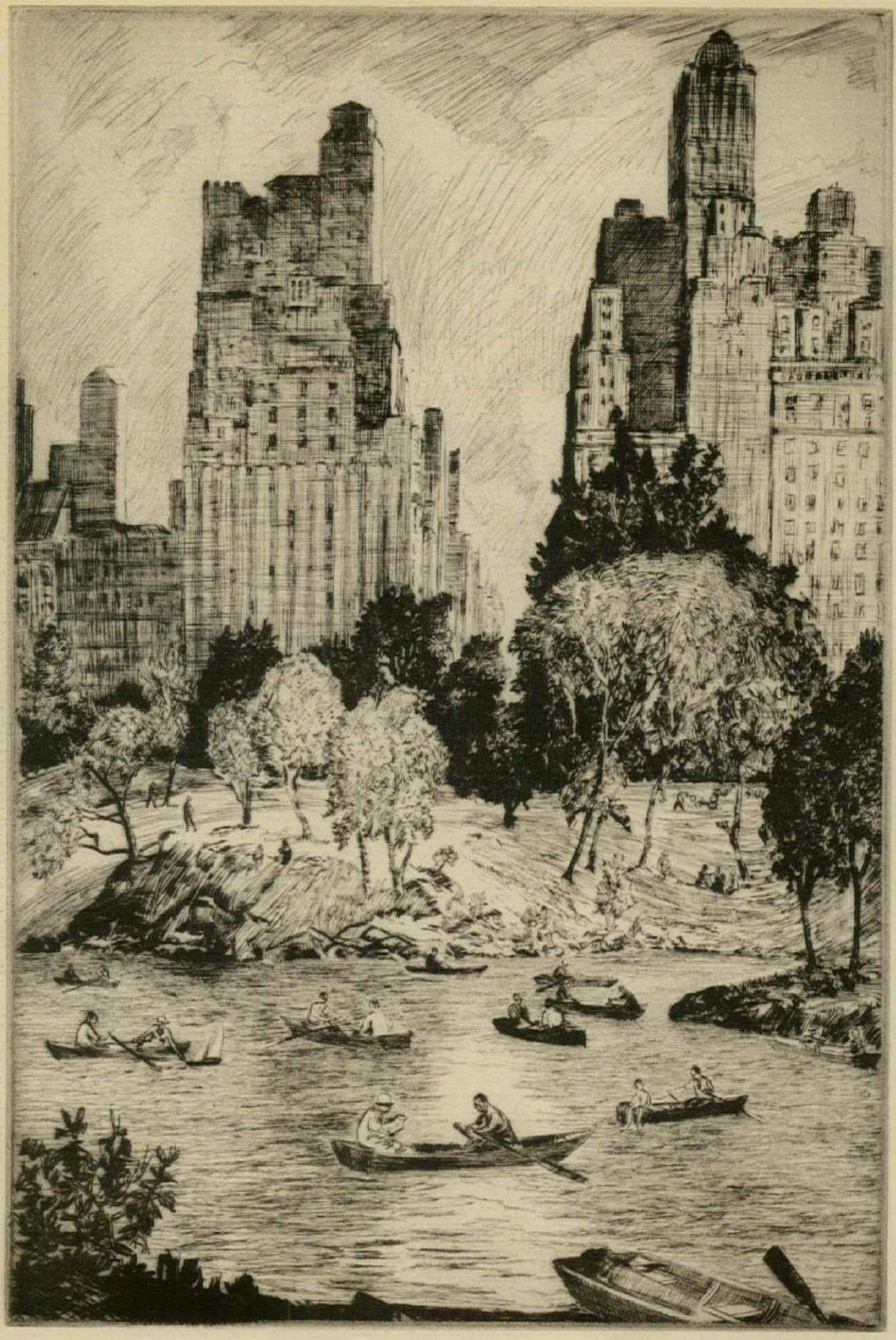


FIFTY-NINTH STREET LAKE
FROM A DRYPOINT BY WILLIAM McNULTY
Courtesy of Kennedy and Co., New York

Design in Modern Architecture

11—Decorative Sculpture

By John F. Harbeson

"*Moreover one should not deceive himself by hasty judgment, or be too prompt to condemn. Time sets aside condemnations of a new tendency. Let us remember how many works were, but a few years since, spoken of as the work of madmen, or atelier jokes, which today are considered inevitable results of tradition.*" — *Vol. I.*

"*At this moment the general tendency (of sculpture) is towards creations of an architectural kind. Architecture is becoming an imperative domination before which ornament diminishes, modestly shrinks, disappears. There remain only the great constructive planes of intangible austerity.*"—*Vol. III.* RAPIN, *La Sculpture Décorative Moderne.*

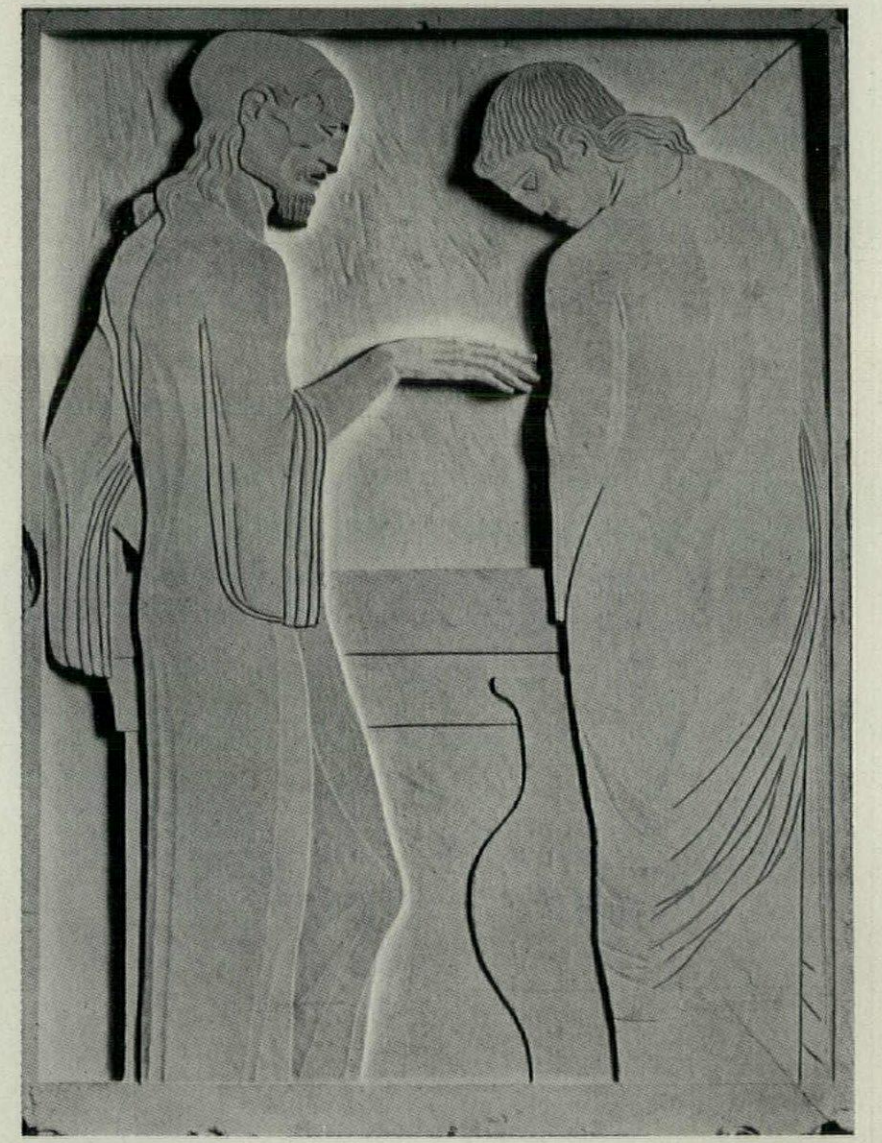
The most interesting characteristic of modern decorative sculpture is its architectural quality: that, like architecture, its important requirement is in its composition—the arrangement of its masses, of its lines and planes, the study of light and shade—and that the imitation of nature has become of little importance.

Architecture has always been, with few exceptions,* a non-imitative art. It appeals to our æsthetic senses with a system of eye-effects: combinations of mass, studies in contour, contrast of

**One of the exceptions, which are "usually symbolical to the mind rather than imitative to the eye . . . is the shape of the cross, with its innumerable varieties and modifications for (the plans of) Christian churches." SIDNEY COLVIN, "Fine Arts," Encyclopedia Britannica.*

BAS-RELIEF PANELS AND, ABOVE, "HERACLES, THE ARCHER," BY BOURDELLE

At left and right, bas-relief panels, "The Dance" and "Comedy," on the Théâtre des Champs Elysées, Paris. Bourdelle's work for this theatre, especially the relief work, gave him his first public recognition on a large scale. The architecture of this building is severe (its architect, Perret, designed also the concrete church at Le Raincy); its only embellishment is the sculpture. (From "The Arts.") Above, "Heracles, the Archer," by Bourdelle, in the Luxembourg Museum. All of this work is directly inspired by archaic Greek work; Bourdelle has proved in his portrait work, in his war memorial in Alsace, and in his equestrian statue of Alveolar that he can as successfully work without such inspiration.

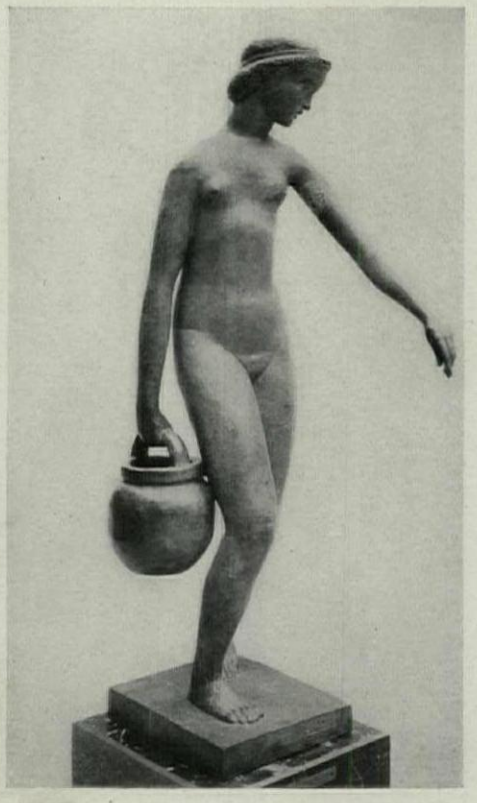


TWO BAS-RELIEFS BY IVAN MESTROVIC. AT LEFT, "THE ANNUNCIATION," AT RIGHT, "CHRIST AND THE WOMAN OF SAMARIA"

This work of the Jugo-Slav sculptor, with its cut-out outline, seems rather drawing than sculpture, for there is almost no modeling at all, certainly no realistic modeling. It is decidedly architectural in feeling, with something Egyptian in its handling. From Aumonier, "Modern Architectural Sculpture."

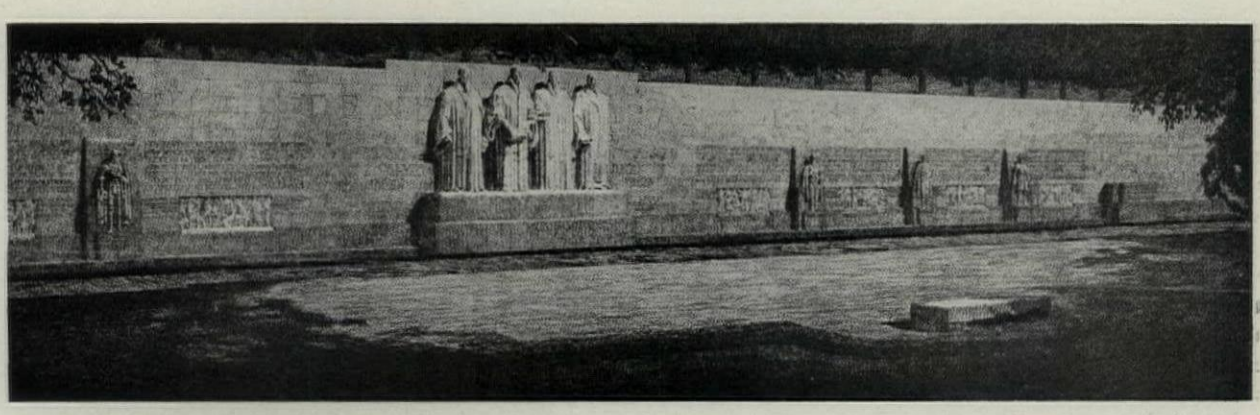
PIER OR BUTTRESS FIGURES ON THE NEBRASKA STATE CAPITOL, BY LEE LAWRIE, SCULPTOR—BERTRAM GOODHUE, ARCHITECT

This form of composition, so successfully treated here, of figures completely carved at the top, but growing out of uncarved stone at the bottom, has since been widely imitated. The form, appropriate in stone, has been used less happily in terra cotta and bronze. From "Modern Architectural Sculpture," Aumonier.



MODERN FRENCH SCULPTURE, SHOWING SEVERAL TENDENCIES OF THE MODERN SCHOOL

At left, below, "The Sculptor" by Bouchard, inspired by Greek work, with little realism. To the right above, "Ame de France" by Ch. Sarrabezolles, realism as to the figure, simplified as to the drapery, sentimental in treatment, although the big lines of the composition are good. Above left, "Porteuse d'Eau" by Bernard, no realism, an idealization of the human figure, much like the ideal Greek gods and goddesses except as to surface treatment. At right, below, "The Architect" by Bouchard.



REFORMATIONS DENKMAL, GENEVA—MONOD, LAVERRIERRE, TAILLENS AND DUBOIS, ARCHITECTS

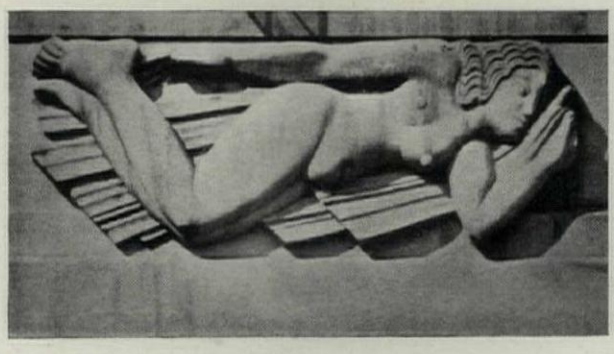
This monument to Calvin and his contemporaries, designed before the war by the architects, is one of the early works of the modern movement. There is no ornament in the composition, which depends only on the figures of the reformers, and the inscriptions.

plain with decorated parts, proportion—architectural design, in fact. And in archaic times in Egypt, in Assyria and in the lands of Grecian culture, sculpture was not so much imitative in character as it was conventional, formalized, decorative—architectural. The sculptural work of all primitive civilizations is of this kind, as we shall see later. This is probably the result of a lack of knowledge or technical skill on the part of the sculptors, rather than the result of conscious intent. But the product was sculpture of architectural quality.

As the skill of the sculptors increased, sculpture became more and more of an imitative art. The effort was to produce realistic work. The Greeks of the great age of sculpture—the time of Phidias, Scopas, Praxiteles—achieved a great measure of realism without losing a formalized architectural quality. The Gothic sculptors are known for their realism, but this did not interfere with their keeping architectural sculpture definitely architectural—conventionalized. One has only to look at the elongated saints in any of the great church portals to see how the human form was distorted, conventionalized, perhaps unconsciously, to properly fit an architectural composition.

But the faithful imitation of nature was still the goal of the sculptor, especially on works of "pure sculpture," works composed within themselves and not primarily as adornment to architecture. The sculpture of the last half of the nineteenth century is a sculpture of realism, with costumes, draperies, hair treated with great skill in a very realistic manner, sometimes with photographic exactitude. The "Rogers Groups" of our grandfathers were but one phase of this tendency. The education of the sculptor and the painter was an education in the imitation of nature: constant study from the nude—and for the painter from still life—and work in anatomy. Composition was thought of simply as the arrangement of such material, material with which practically no liberties could be taken.

The work of Auguste Rodin was the culmination of this movement. He believed himself a rebel against the academicism of his day; no doubt he was in the matter of technique, where his revolt led to a rebirth of the craftsmanship of sculpture. But from the short perspective of the few years since the war, he stands as the epitome of that training—the master realist who could express human flesh, human emotion with such astonishing skill that critics believed some of his earlier works to be casts from nature. And his most ambitious attempt at monumental work, the "Gates of



BAND-MOULD SCULPTURES BY ERIC GILL ON THE UNDERGROUND RAILWAY HEAD OFFICES, ST. JAMES PARK, LONDON, ENGLAND

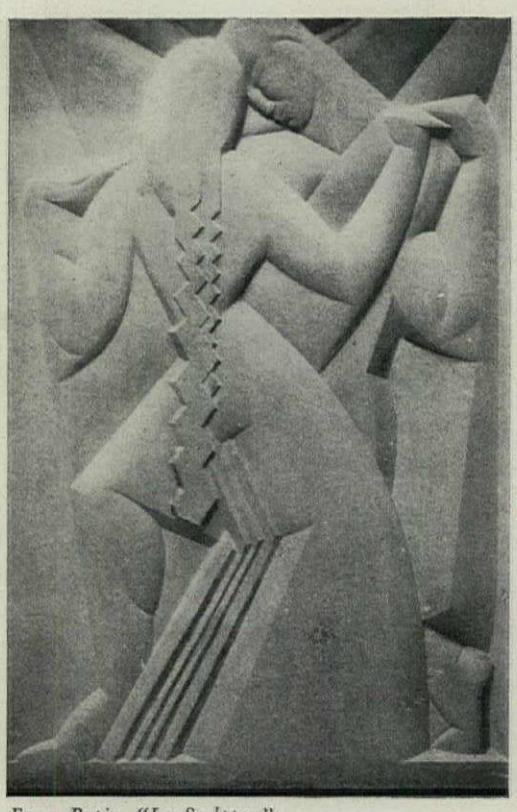
At left, "The South Wind"; at right, "The East Wind." (The figures of "Day" and "Night," by Jacob Epstein, shown in the January, 1930, issue of PENCIL POINTS *are the most important—and most controversial—of the sculptural work on this building, which was awarded the medal of the Architects' Association of London. Adams, Holden and Pearson, Architects.) From "Modern Architectural Sculpture" by W. Aumonier.*

Hell," on which he spent such a large part of his life and which he hoped to leave as his great achievement, remains a tragic failure from this viewpoint, a work without form, without composition.*

His pupil Bourdelle was the antithesis of this: he was a true architectural sculptor: he understood the relation of material to form. His architectural sculpture is made to relate definitely to the architecture—is made to be secondary to it.† His best known work is that on the Théâtre des Champs Elysées in Paris, of which Perret was architect. The reliefs on the exterior of the building are directly inspired by Greek archaic work, and have somewhat the Egyptian feeling of being cut out around the edges. The American, Lee Lawrie, has done work in this manner, at the Nebraska State Capitol and at the Fidelity Mutual Insurance Building in Philadelphia. The flat sculptural reliefs are simplified, to emphasize the plastic essentials of the figures representing "The Dance," "Tragedy," "Comedy," and so on. The success of Bourdelle's work lies in its architectural quality. This was a conscious effort on his part; in working with his pupils in the atelier he stressed the inter-relation between all the arts, the close relation which sculptor and painter should feel for architecture and for the decorative and industrial arts. It is well to remember that in early times the architect and sculptor were less separated—were sometimes the same man. Michelangelo, known equally

*"*Rodin was too deeply concerned with the ecstasies and mysteries of flesh, because he immortalized the ephemeralities of human emotion, the impalpability of human thought, that balked his efforts to create monumental sculpture.*" H. A. Reed, "*Bourdelle,*" in "*The Arts.*"

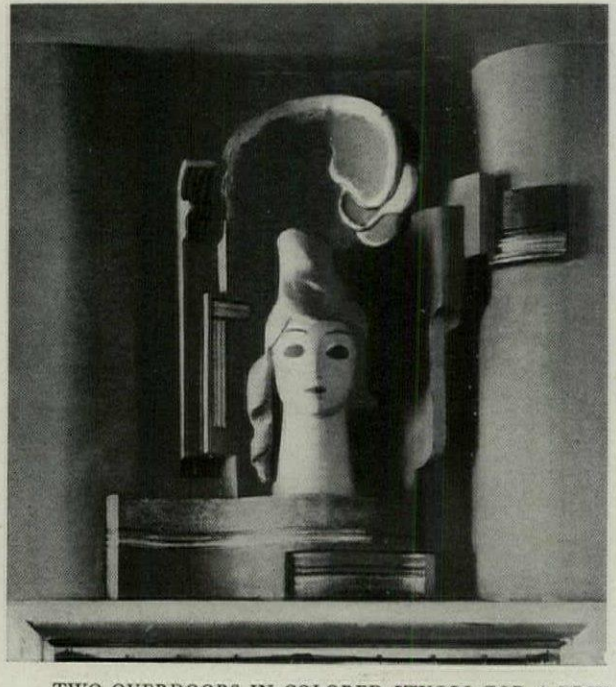
†"*A work by him is not a bouquet suspended from a tree. It is the actual flower born from the tree. It expands on its stone building and cannot be separated from it.*" *Handbook on Bourdelle, by Fosca.*

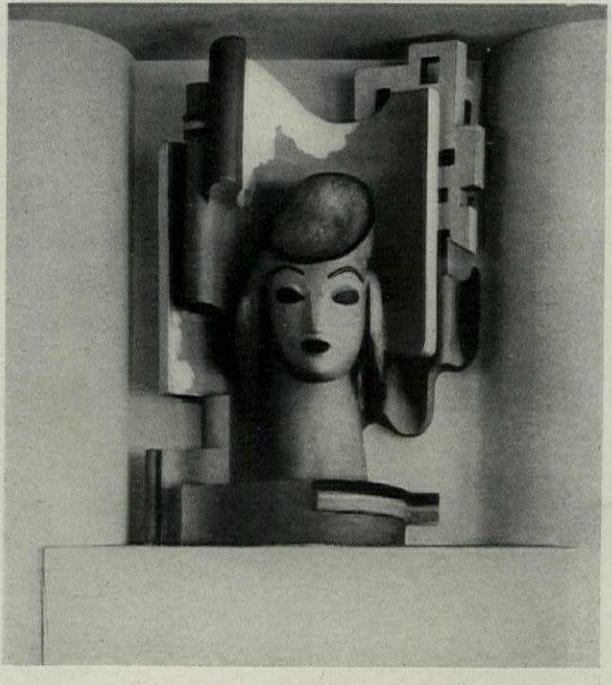


From Rapin, "La Sculpture"

DANCING FIGURES, BY JOEL AND JAN MARTEL

This bas-relief shows an interesting attempt to use the effects of modern drawing in sculpture. Note the broken diagonal lines, much used in illustration, in this composition.





TWO OVERDOORS IN COLORED STUCCO FOR A PRIVATE HOUSE IN BERLIN, BY PROFESSOR WALTER REGER

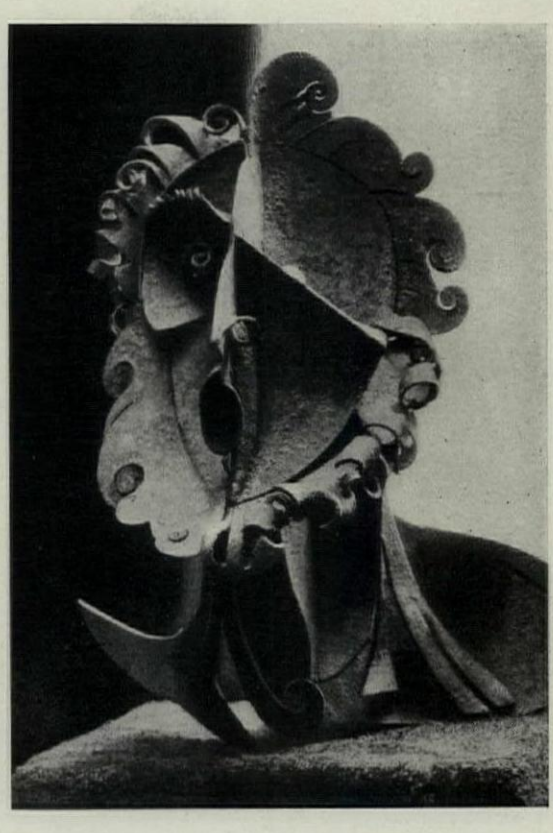
An illustration of cubist expression in sculpture, broken planes treated definitely as is asymmetrical architecture—a composition of lines, planes, light and shades, with little regard to subject matter. From Aumonier, "Modern Architectural Sculpture." Aumonier, himself a sculptor, says in his introduction: "It is clear that the modern phase of the sculptor's art is largely brought into being by the present vogue for simplicity and directness in building. The craftsman, ever quick to adapt himself to the conditions imposed upon him, has eagerly seized this opportunity for a new form of individuality and a new self-expression, and as a result there have been some extraordinary developments in decorative sculpture, many of undeniable power and beauty, others, in my opinion, merely burlesques in art."

well for his dome on St. Peter's at Rome and for his "David," did excellent architectural sculpture—the decoration of the friezes and sarcophagi in the Medici Chapel, for instance.

There was thus a natural evolution in France from the sculpture of realism to the sculpture of today in its several forms. The same evolution has taken place in every country of Western civilization: since the turn of the century there has been a similar movement away from the imitation of nature, toward what might be called an architectural approach to sculpture. Some sculptors are more extreme than others —Brancusi, for instance, has made "portraits" of geometrical forms, where the artist's interest was in the play of line and relation of masses, and no profound human problem troubled him; but in all cases it has been a sophisticated movement—the result of study. Sculptors have begun to use "documents" as architects use them; they study the work of the past, and more particularly the works of lesser-known periods of the past, for inspiration. All primitive art has been studied, including the arts of peoples still primitive in recent times. Much of this is geometric in feeling, all of it is decorative.

GUITAR-PLAYER BY PABLO MANÈS

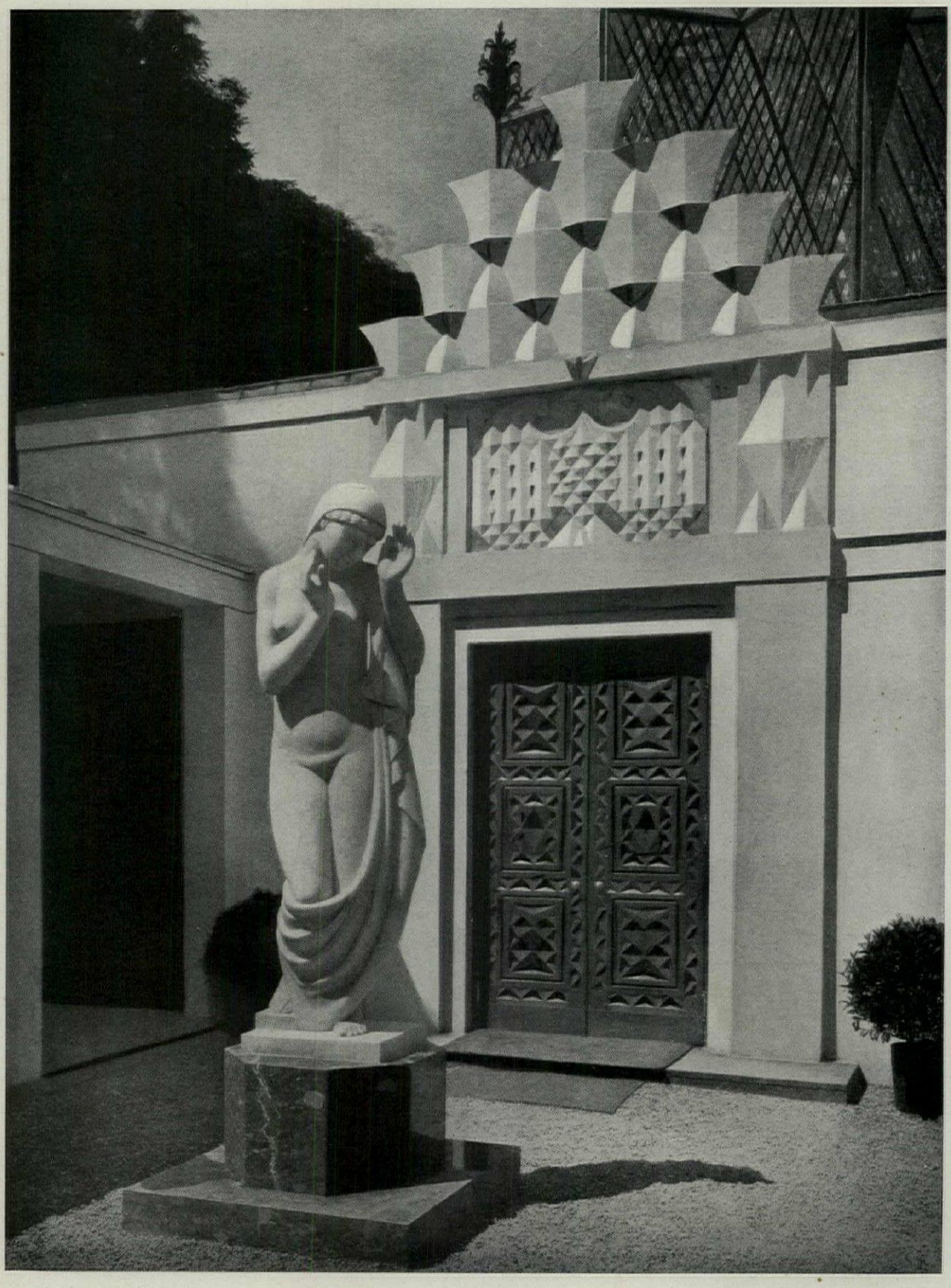
Negro art (some of it has been claimed to be of mediæval times) has more than any other seemed to those interested in the modern movement to express the quality they are seeking—an almost architectural quality resulting from the use of



From "L'Art Vivant"

MANNERED FORMS OF MODERN SCULPTURE. AT LEFT "ARLEQUIN" AND RIGHT, MASQUE, BY GARAGALLO

The human figure serves only as a point of departure for some sculptors, who then push in a plane or push it out much as an architect studies the effect on his architectural design of pushing back or bringing forward the wings of a building, and fixes the design when he has decided which position forms the best arrangement of masses. Sculptors of this school frequently omit an eye, or may have one breast concave and the other convex. The work should be judged, of course, by its success in mass arrangement, not by its failure to express human anatomy.



POLISH PAVILION, EXPOSITION OF DECORATIVE ARTS, PARIS, 1925—SCULPTURE BY HENRI KUNA

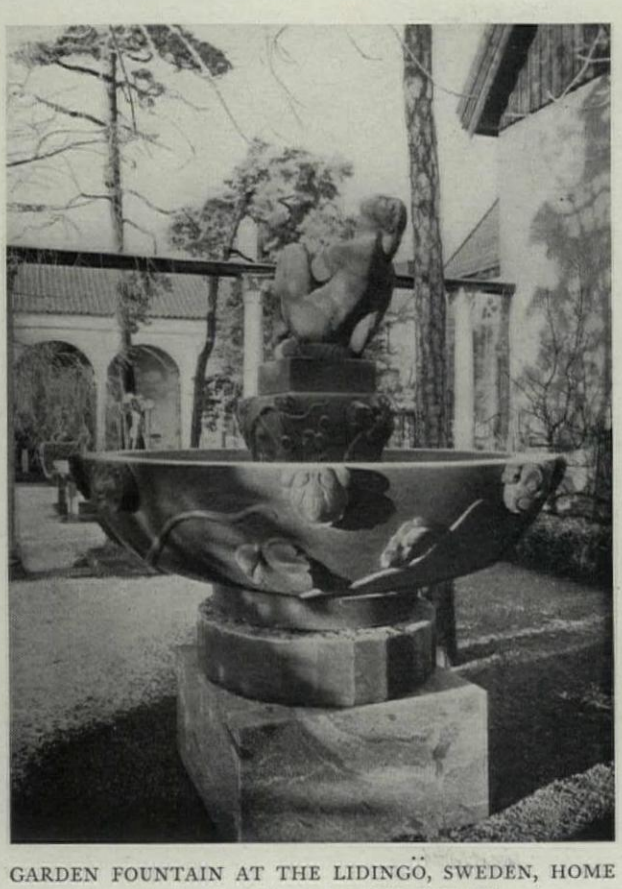
The figure is treated in much the same manner as is the water carrier of Bernard (page 488), a simplified and idealized human figure. The relief work on the building shows how satisfactorily geometrical design, studied as to projection, can take the place of the strapwork and cartouche designs of the last two centuries in giving a feeling of enrichment, a play of light and shade, at a place to be accented, and in a manner that in itself will not detract from the general impression of the building by drawing attention to itself.

PANELS ON THE FOLKUNGA FOUNTAIN AT LINKÖPING, SWEDEN—CARL MILLES, SCULPTOR

Work of Carl Milles, modern Swedish sculptor, now spending part of his time in America, which has the architectural quality so much attempted by modern sculptors, without losing beauty of modeling or interest of subject matter.

natural forms, distorted or conventionalized as may be desirable to obtain a rhythmic beauty of form, for compositional purposes. All of the primitive arts have in common a breadth and simplicity of treatment and a strongly marked decorative character, arrived at unconsciously. It is this that the modern sculptors strive for, consciously. And as these ends are in the direction of architecture, as the sculptors believe that "form should follow material" just as the architects believe that "form should follow function," it is but natural that the two arts now find themselves talking the same language, and are able to collaborate toward what they believe to be rhythmic beauty of form.

There is this community of interests between the two professions not in one country, but in all the countries of Western civilization. The movement has varying results, depending upon the traditions of its locality, but everywhere there is the same revolt from the realism of the 19th century, the same interest in composition of form and line, the same willingness to distort, elongate or shorten or repeat the lines and masses of human or other natural forms, the same study of archaic and primitive work especially, but also of any past work as a fund of ideas with which to feed the imagination. All of the new art has developed from research of some sort; in spite of the unsophisticated character of much of the material used for this research it is a very sophisticated expression.

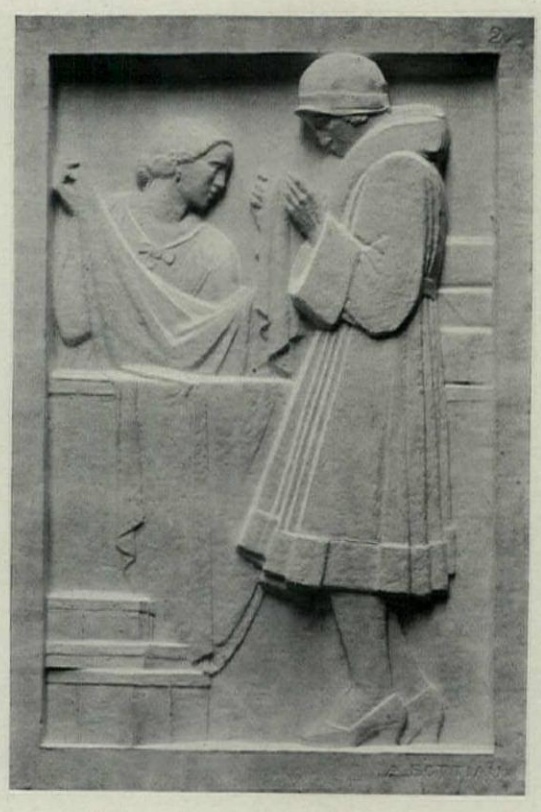


GARDEN FOUNTAIN AT THE LIDINGÖ, SWEDEN, HOME OF THE SCULPTOR, CARL MILLES

The modern sculptors realize that the chief purpose of any architectural decoration or ornamentation is to enrich the surfaces on which it occurs, and that interest in the sculpture itself must be kept subsidiary to this. One tendency of modern architects is to simplify the design of buildings to the ultimate; naturally, the simpler the building, the more such sculpture as is used will count, and hence the importance of having this sculpture in harmony with the architectural quality of the building.

The sculptor of today must know something more than the human figure, more than anatomy. The first essential is skill in composition, in proportion, in taste—and these are also the essentials of ability in architectural design. It is for

"AGRICULTURE"



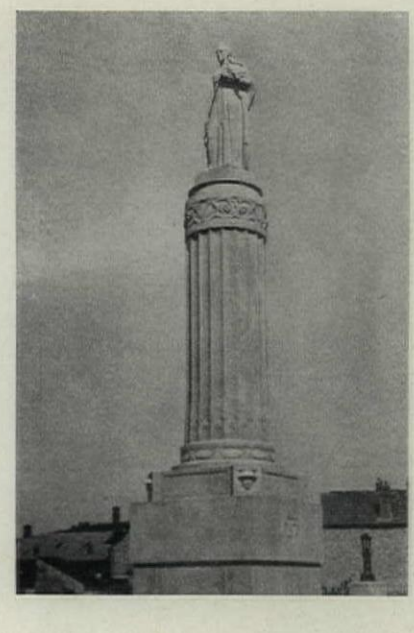
"MERCHANDISING"

"NAVIGATION"

"TRANSPORTATION"

BAS-RELIEFS CUT IN MARBLE IN THE INTEGRITY TRUST COMPANY, PHILADELPHIA, BY A. BOTTIAU

This sculptor, who also did the work on the Hartford County Court House, has an architectural feeling for composition.



LEFT—ONE OF TWO FIGURES ON THE COLUMN PYLONS OF THE BRIDGE-HEAD AT FISMES, FRANCE: THE PENNSYLVANIA STATE WAR MEMORIAL, BY A. BOTTIAU (PAUL P. CRET, ARCHITECT)

Here the figure, to carry out its function as an integral part of the pylon, is made heavy, solid at the base, and studied in silhouette as a part of the architecture.

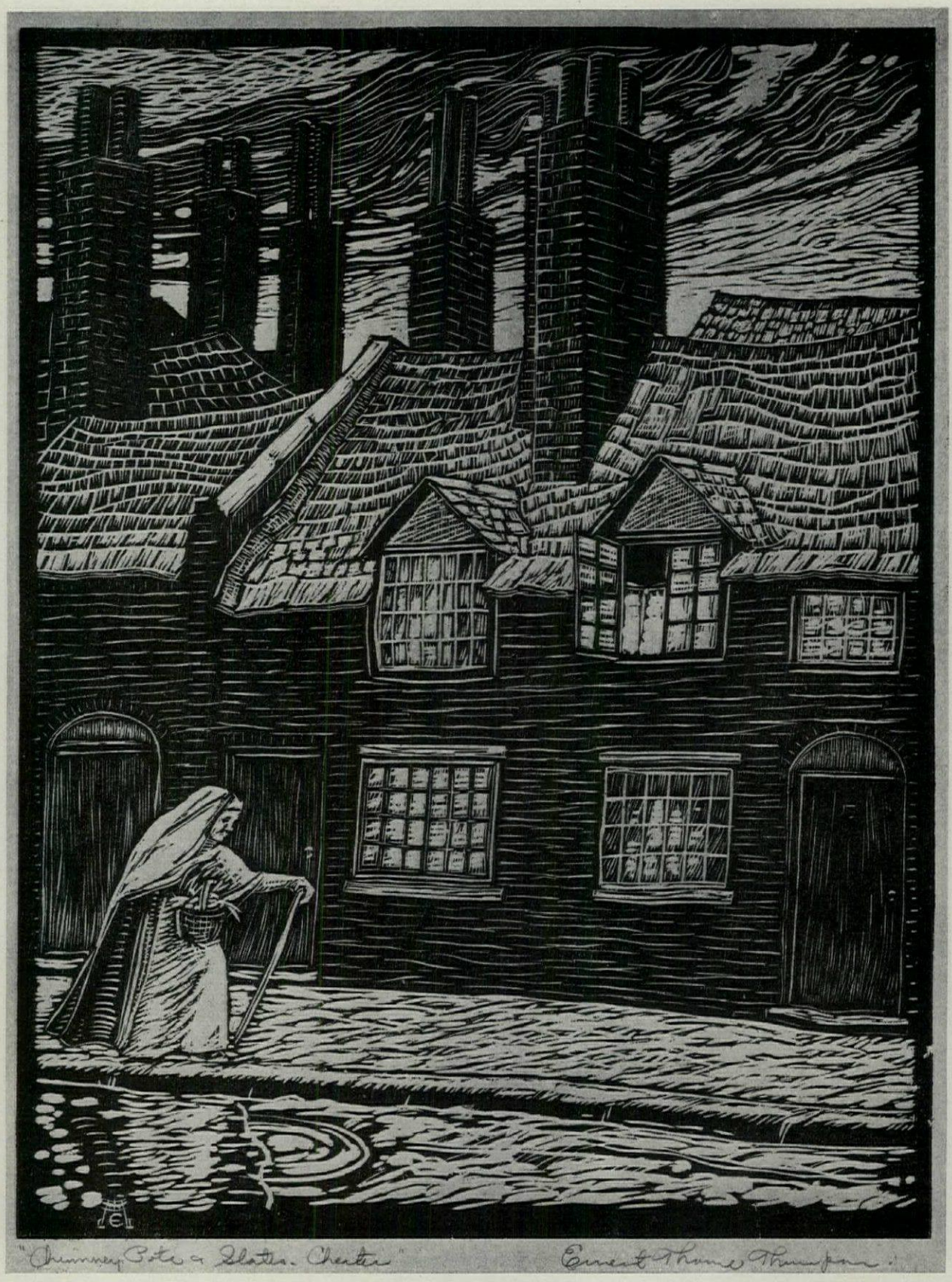
RIGHT—MONUMENT DE PEZENAS, BY J. COSTA

This figure, done in bronze in 1919, shows the same simplification, the same architectural treatment, as the work of Bottiau. This is very different in treatment from the naturalistic figures of soldiers done by so many sculptors since the Civil War, and still being done by some sculptors.

this reason that the program of some of the modern schools (the American Academy in Rome, Yale School of Fine Arts) is based to some extent on a collaboration between students in the several arts, a program which has already proved its value.

DETAIL OF SOLDIERS' MEMORIAL, VESIN, FRANCE, BY PAUL MANSHIP

This American sculptor, at one time a Fellow of the American Academy in Rome, began his work with studies in the manner of the Græco-Roman bronzes. An accomplished modeler, he makes sculpture architectural in composition and treatment without sacrificing beauty of detail. From "Modern Architectural Sculpture," Aumonier.



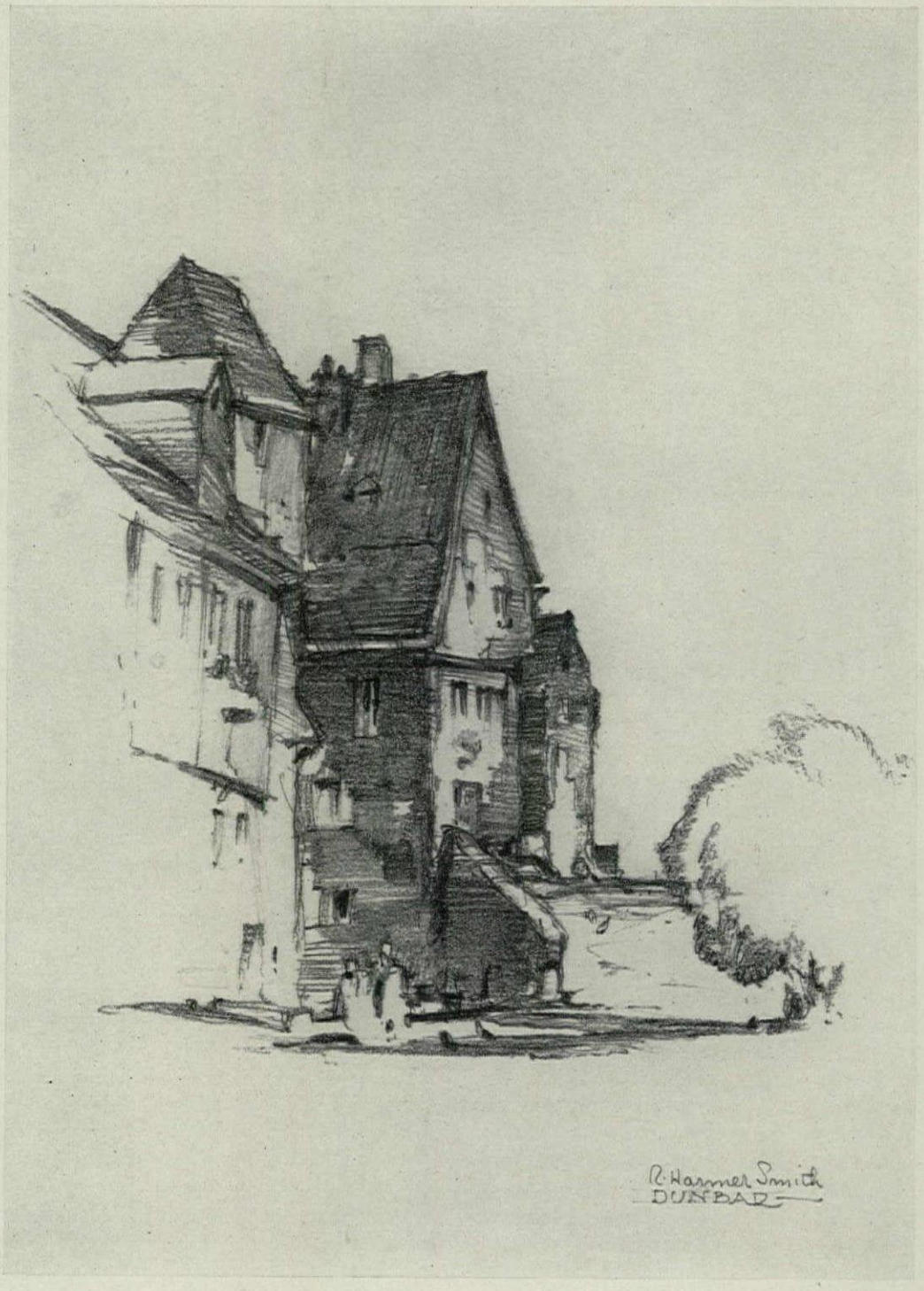
FROM A WOODCUT BY ERNEST THORNE THOMPSON
"CHIMNEY POTS AND SLATES, CHESTER, ENGLAND"

Pencil Sketches by *R. Harmer Smith*

After a certain point in one's development, simple sketches of objects no longer completely satisfy; those serving only to recall pleasant associations give place to attempts to produce pictures, decorative interpretations that are interesting because of a strong design element as well as the interest native to the subject. Stated in other words, the sketch is no longer made exclusively for the subject's sake; the reverse is now true, causing the subject to become merely a vehicle for tonal patterns designed by the artist although the subject retains its identity. The sketches reproduced here were made as a series of experiments illustrating this transition and in each a deliberate effort was made to reduce the architectural subjects to decorative compositions.

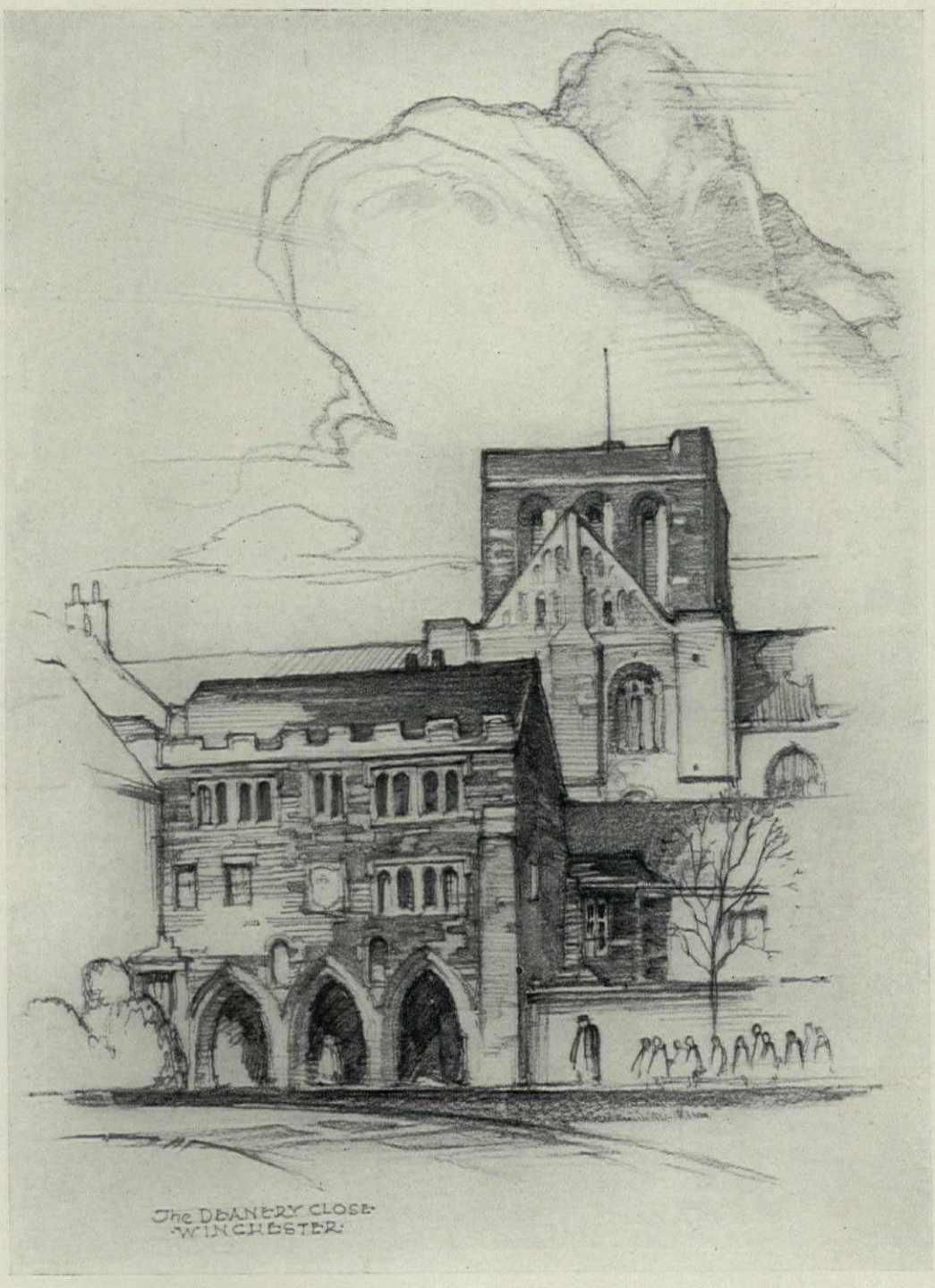
All of these sketches were made from photographs with the exception of the one made on the spot in New Haven. The use of photographs is deprecated by some, but assuredly they permit of more intense application when the drawings are considered exercises. The composition is begun by developing some point that is particularly picturesque. It is then made to include other points of secondary importance by means of a pattern of tones which embrace them and give form and substance to the sketch. Anything superfluous to the definition of the subject is omitted altogether, but enough is shown aside from the already established "path of interest," so that the drawing reads. Invariably this procedure results in an arbitrarily designed pattern being superimposed upon the buildings except in those cases where the subjects compose themselves. When cloud forms, shadows from outside the sketch, birds, or people are introduced, it is generally to supplement this arbitrarily laid down pattern and in addition to give life to the sketch. The actual values of the subjects are also departed from if more pleasing combinations of tone may be obtained and if the existing values are undesirable they are eliminated. Care is taken that the vignetting of the sketch especially does not become too interesting as this will immediately detract from the "center of interest" and therefore destroy the unity of the composition. Taken all in all, the "path of interest" constitutes the body of the sketch and particular attention is given to its design; it should not be soft or diffused. Once the "path" is successfully established considerable drawing may be done to give added interest without lessening the strength of the composition.

A good test of quality in the completed sketch is to examine its reflection in a mirror, it seems almost as if it were another drawing and any weaknesses there might be are more readily recognizable and the correction is more obvious. Turning the sketch upside down is nearly as good and a great deal of work on the sketches shown was actually done in this position. In a good sketch, the eye goes first to the "center of interest," next travels over the "path of interest," and then is led out gracefully through the vignetting. Any byways should be entered only advisedly. For study in visualizing possible compositions thumb-nail sketches are invaluable; they provide much entertainment with little work.—*R. Harmer Smith.*



DUNBAR—SKETCHED IN PENCIL BY R. HARMER SMITH

Reproduced at exact original size.



SKETCH COMPOSED FROM A PHOTOGRAPH, BY R. HARMER SMITH

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SHREWSBURY—SKETCHED BY R. HARMER SMITH FROM A PHOTOGRAPH

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SKETCH DIRECT FROM NATURE BY R. HARMER SMITH

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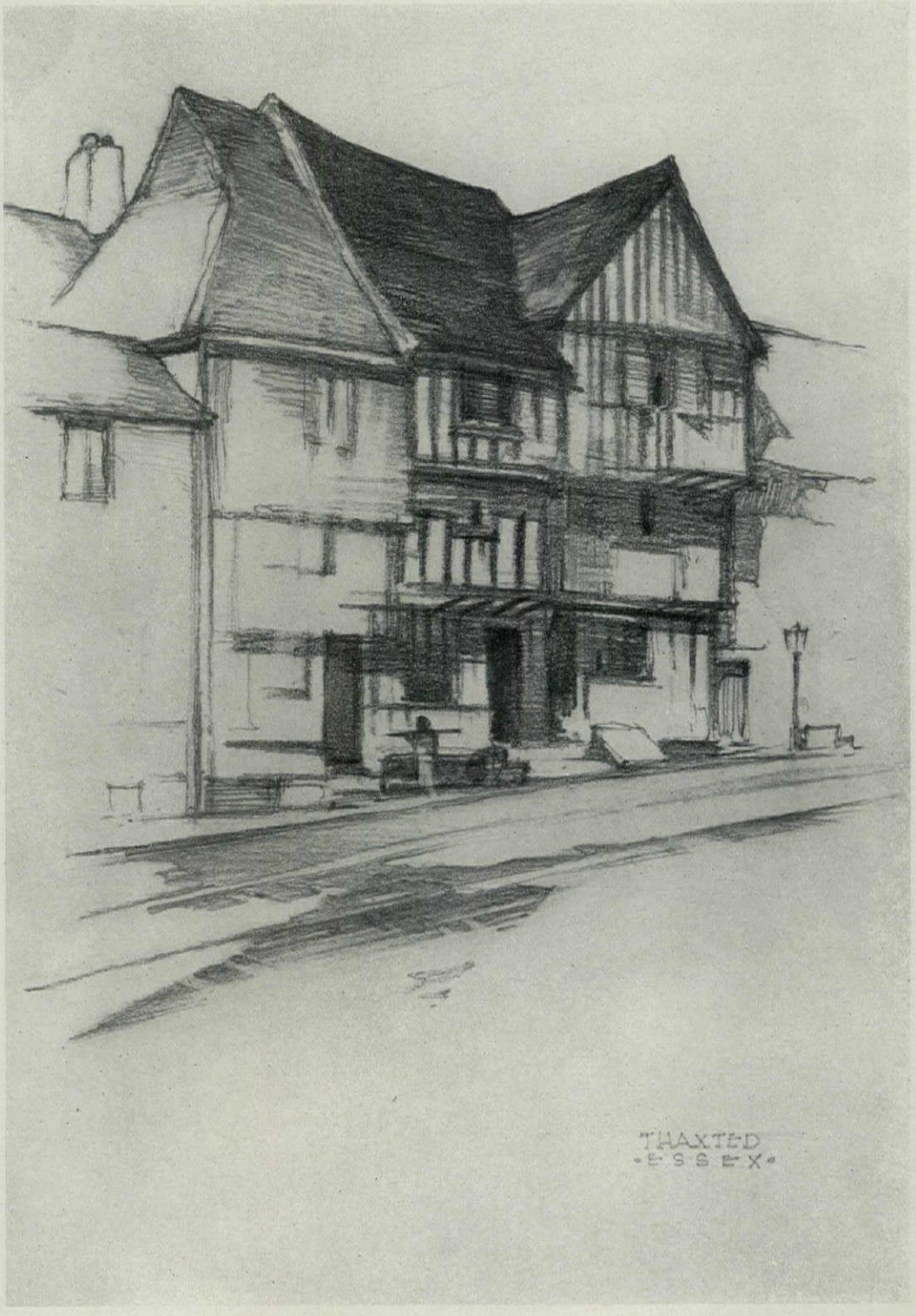

FROM A PENCIL SKETCH BY R. HARMER SMITH

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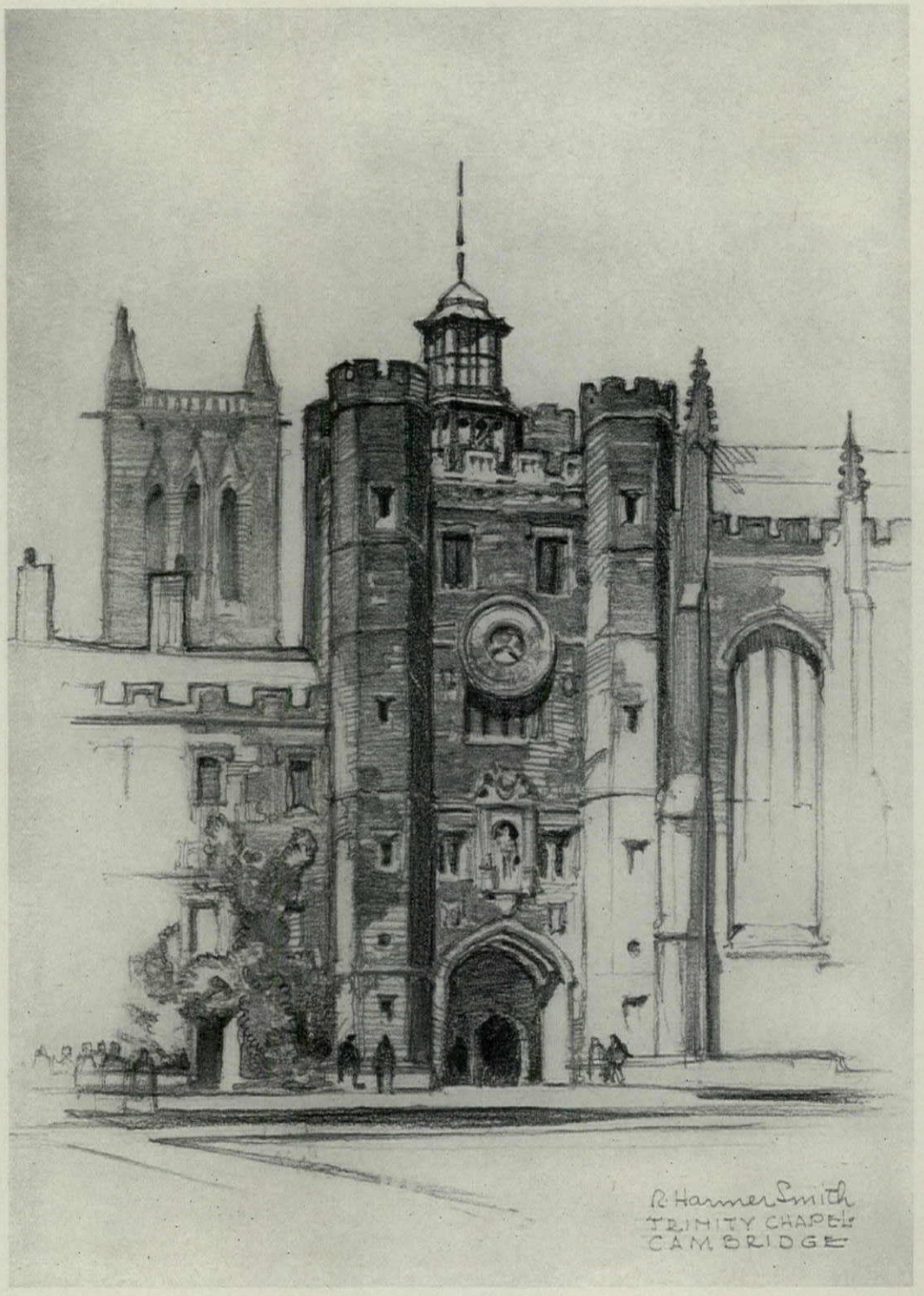

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The Geometry of Architectural Drafting

17—Geomathematics of the Circle

By Ernest Irving Freese

Editor's Note:—*This article, which is copyrighted, 1931, by the author, continues the series begun in August, 1929.*

Arc centers, and other points associated with the laying out of partial or complete circles, are not located *on the job* by any process akin to geometrical construction. They are determined by reading the *figured dimensions* placed prominently and unmistakably on the working drawings for that express purpose. They are not found graphically. They are located by rule measurement, not by geometry. But geometry—and geometrical analysis — *pre*determines the measurement in the *drafting room.*

Wherefore, the ability to dimension accurately the working drawings he has produced is an essential part of the expert draftsman's stock-in-trade. At the same time, however, it can not be insisted upon that even an *expert* draftsman be so well versed in analytical geometry as to be able to *derive* the formulas by means of which any required dimension associated with the definition of circles or circular arcs can be found. The derivation of such equations presupposes a practical working knowledge of higher mathematics that but few draftsmen ever acquire. It's a *gift* more than an acquirement anyhow! Yet, constantly in practice, the need of such formulas—short cuts, you may call them—is present. However, after the needed general formulas are once derived, the required unknown values equated thereto become easily discoverable by a mere application of common arithmetic, which latter science is most certainly intimately associated with the production of working drawings and pay rolls—the one in direct ratio to the other. Of course, there are some highfaluting, Windsor-tied, smock-clad superpersonages to whom even the bare mention of the term "arithmetic" puts their sensitive souls in torment: they prefer to travel under the exclusive cognomen of "designers." And many of them *do* travel—from one office to another. But the real *draftsman* stays put—*and gets out the working drawings.* To the latter, this "analytical" detour will prove a welcome and *profitable excursion.*

Although this Part and Part 18, following, are largely devoted to the *figured dimensioning* of circular arcs, we are not yet finished with the "graphics" of the circle; that is, with the *drafting-board* constructions having to do with the *drawing* of them under any given or imposed conditions. Beginning with Part 19 you will find simple ways of discovering the exact point at which to center your compass to produce the particular circle or arc required in the geometrical solution of any such problem that may arise. The last vestige of guesswork methods and time-wasting "try-it-and-see" maneuvers will be banished from the boards. Meanwhile, Parts 17 and 18 are inserted for their immediate practical value. They are a much-needed contribution to the geomathematics of the circle. But the "analytics" are *buried deep,* so that, with no mathematical knowledge higher than school-day arithmetic, *any* draftsman can now properly dimension any circular curve whatsoever that is not ordinarily taken care of by full-size detailing. Moreover, the "engineering" force, in the larger offices, will at once recognize the value of the time-saving mass of general data herewith and in Part 18 made available both for immediate use and for constant future reference.

Figure 151:

Here are the simple fundamentals: the groundwork of what I have termed the "geomathematics" of the circle. By means of the three diagrams under "Linear Proportions" you can at once discover any two of the three dimensions of a full circle in terms of the one known or given dimension. If the *diameter* is given, multiply it by 355, and divide the product by 113: the result is the length of the circumference. The same result comes from multiplying the *radius* by 710, and then dividing the result by 113. Or, if the radius is required for a fixed length of *circumference,* the third diagram indicates that it is 113/710ths of the given length of circumference. The results are more exact than using the commonly-accepted "pi" value of 3.1416 for the ratio of length of circumference to length of diameter. Moreover it is sometimes desirable, for one reason or another, to determine a circle whose diameter and circumference can be expressed in integers or commensurable numbers instead of in never-ending decimals. By adopting the fraction 355/113ths as the finite value of "pi," this can be done, and the discrepancy in circumference will be less than 1/58th of an inch *per mile diameter.* In other words, by using the "pi" value stated, if the diameter were made 113 *inches,* the circumference would become 355 *inches.* If the diameter were made 113 *quarter* inches, the circumference would become 355 *quarter* inches: etc., etc. Obviously, the same commensurable system can be applied to *portions* of circles as well. Also, remem-

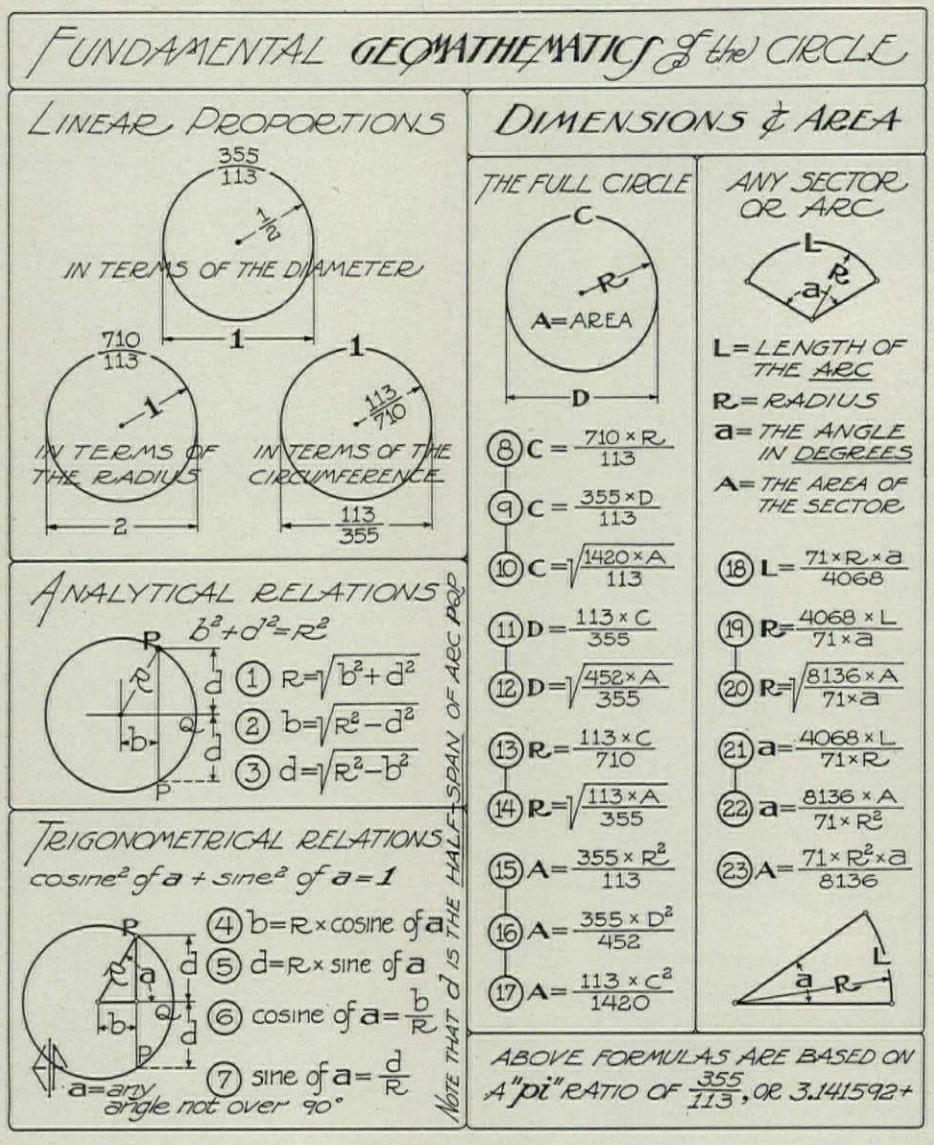


FIGURE 151

ber this: the circumference of *one* circle is to the circumference of *another* as the radius or diameter of the one is to the radius or diameter of the other. Said in another way: the difference in length between any two circumferences is equal to 355/113ths of the difference in their *diameters*. If a hoop were 1″ greater in diameter than a barrel, then the hoop's length would be 355/113ths *inches* greater than the barrel's circumference; and if a hoop were 1″ greater in diameter than the earth, then the hoop's length would still be that same 355/113ths *inches* greater than the *earth's* circumference. Do you get that? All right, answer this one: a semicircular arch ring has a radial width of 1′ 9-3/16″; how much longer is the extrados than the intrados? But that was too easy. Try this one: an 8″ ungauged brick "soldier course" arch springs from skewbacks inclined at 45 degrees to the spring line. How much more aggregate distance do the mortar joints occupy along the line of the *extrados* than they do along the concentric line of the *intrados*? Both of these problems can be solved by the information conveyed in this one paragraph. If you get 5′ 6-9/16″ for the answer to the first, and 1′-9/16″ for the answer to the second, then already you have learned something that may "come in handy" sometime when you are struggling with a full-size detail of arch ring jointing, and the center of the arch is not in the drafting room.

Under "Analytical Relations," of Figure 151, the basic coordinate equations of the circle are given, by means of which any one of the linear values there diagrammed can be found in terms of the other two. Suppose a certain point, *P*, on the line of a circular arc, must be definitely located in reference to any pair of rectangular axes passing through the center of the circle. The radius of the arc or the circle is, say, 4′-5″, and the known or fixed distance, *d*, is 3′-9″. Then the other necessary dimension, *b*, will be yielded by a solution of Formula 2. The answer, in this case, is 2′-4″, being the exact square root of the difference between the square of the radius and the square of dimension *d*. These formulas of coordinate or "analytical" geometry, as well as the next four "trigonometrical" formulas, are all applications of the familiar Pythagorean proposition that the square of the hypotenuse of a right triangle is equal to the sum of the squares of the other two sides. In fact, if it were not for the truth of this proposition, there would be no such things as analytical geometry and trigonometry. They *are* the Pythagorean proposition—*nothing else*.

Now, under "Trigonometrical Relations," Figure 151, you will note that the angle, *a*, becomes a factor in the equations. Hence, knowing this angle, and knowing the length of the radius, *R*, the *two* unknown coordinate dimensions, *b* and *d*, locating any point *P*, can be determined by solving Formulas 4 and 5, respectively. As an example, let the known angle, *a*, be 60 degrees, and let the known length of radius, *R*, be 6′-0″. Then, by Formula 4, the required unknown dimension *b* is equal to the product of the radius and the *cosine* of 60 degrees; and, by Formula 5, dimension *d* equals the product of the same radius and the *sine* of the same angle. From a table of natural trigonomet-

trical functions you will find the *cosine* of 60 degrees listed as the ratio .5000000; and the *sine* as .8660254; hence, multiplying these decimals by 6 feet, or 72 inches, and converting the decimalized results to the nearest 32nd of an inch, gives the required dimensions of 3′-0″ and 5′ 2-11/32″ for the rectangular coordinates *b* and *d* of the point *P*. Just remember that the *sine* and *cosine* of the angle designated as *a* are simply tabulated *ratios* which, multiplied by the radius, *R*, yield the actual *lengths* of the rectangular sides of the right triangle whose hypotenuse is *R*. This is clearly shown in the Diagram, and is definitely formulated in the four basic equations there recorded. Evidently, then, if the two rectangular distances *b* and *d* are *known*, rather than the designated angle, the latter can then be determined as follows: first, either by Formula 6 or by Formula 7, compute either the cosine or the sine of the angle; then, referring to a trigonometrical table, find the angle corresponding to this calculated value, either directly or by proportionate interpolation of the tabulated values. A study of the fundamental Formulas 1 to 7, inclusive, will yield the solution of practically all problems that have to do with right-angled triangles, or with the location of any required arc-point either by rectangular coordinate *dimensions* or by units of *angular* designation.

Under "Dimensions and Area," Figure 151, Formulas 8 to 17, inclusive, apply to *full* circles, and they cover all possible conditions: any *unknown* value can thus be found in terms of any other *known* one. Formulas 18 to 23, inclusive, particularly apply to any *portion* of a circle, that is, to any sector or arc up to a complete circle. Here, again, the angle subtended by the arc enters into the equations, not, however, in a trigonometrical relation, but to supply the equations with the needful *lesser* term of the numerical *ratio* that the given arc or sector bears to a full circle of 360 degrees, the latter and *greater* term having been already woven into these formulas. In these six formulas, then, the denomination of the angle, *a*, must always be *degrees;* whole, fractional, or decimal. Suppose that the length of the intrados of a 60-degree segmental arch were required, the known radius being 6′-0″. Here, the unknown length *L*, of the arc, is required in terms of the known radius *R* and the known angle *a*. Hence, Formula 18 applies. This formula tells you, in mathematical shorthand, that the required length of the arc is equal to 71 times the product of the radius and angle, divided by 4068. Let's see what this amounts to. The product of the radius and angle is 6 times 60, making 360; and 71 times 360 makes 25560; and 25560 divided by 4068 yields the length of the arc as 6.283 *feet*, since the radius was taken in *feet*. Multiplying .283 *feet* by 12 gets it into *inches*, the result being 3.396 inches; and .396 *inches*, converted to rule measurement, becomes 13/32nds of an inch. Hence, the decimals are thus finally eliminated, and the length of the arc, in rule measurement, appears as 6′ 3-13/32″. In actual practice, the computations would be considerably simplified by setting down the known quantities in the manner of Formula 18, since then they could be reduced by common divisors and by partial or complete cancellation of one or another of them before making the final multiplication and division. Always bear in mind that all linear quantities must enter the formulas under the same *name*, that is, they must be either feet *or* inches—whole, fractional or decimal—never feet *and* inches. In case the *area* is a factor, then the name of its *square* units must be the same as the name of the *linear* units occurring in the same formula. Also, I repeat, the *angle* in Formulas 18 to 23, inclusive, must always be designated in *degrees* only, whole, fractional, or decimal, never in degrees, minutes, and seconds. If the angle in the above example had been 60 degrees and 2 minutes, it would have been necessary to convert it to the fraction 1801/30ths *degrees*, or to the decimal 60.0333 *degrees*, before using it in the formula. These instructions are exceedingly rudimentary—and exceedingly pertinent. A violation of any one of them will render your ambitious efforts at *figured dimensioning* utterly useless.

Figure 152:

In the layout of long-radius arcs, *on the job*—say for a curved driveway, walk, property-line wall, an arched roof truss or built-up centering for long-radius arches, *plan* curves, etc.—it often happens that the center of the required arc is actually inaccessible. A building, a fence, a group of trees, rocks, a pile of bagged cement, or even a "neighbor," may be in the way of not only fixing the center but also of swinging the required arc with a tape line; or, again, the ground may be so uneven, or slope to such an extent, as to result in inaccurate centering, or in the describing of curves that are certainly *not* circular! In these cases, and in other less common cases, the required arc must be staked out on the ground or plotted in position by a series of close-together consecutive points located therealong—the spacing of the points depending on the degree of curvature and the degree of accu-

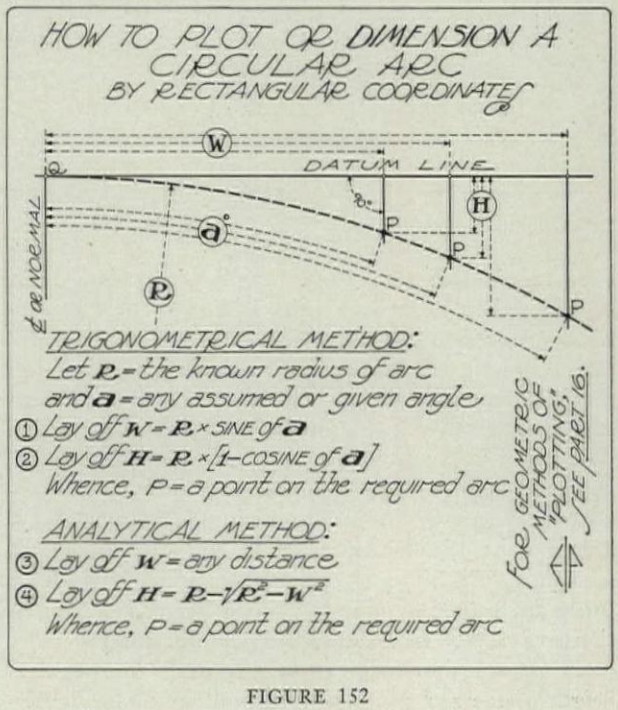


FIGURE 152

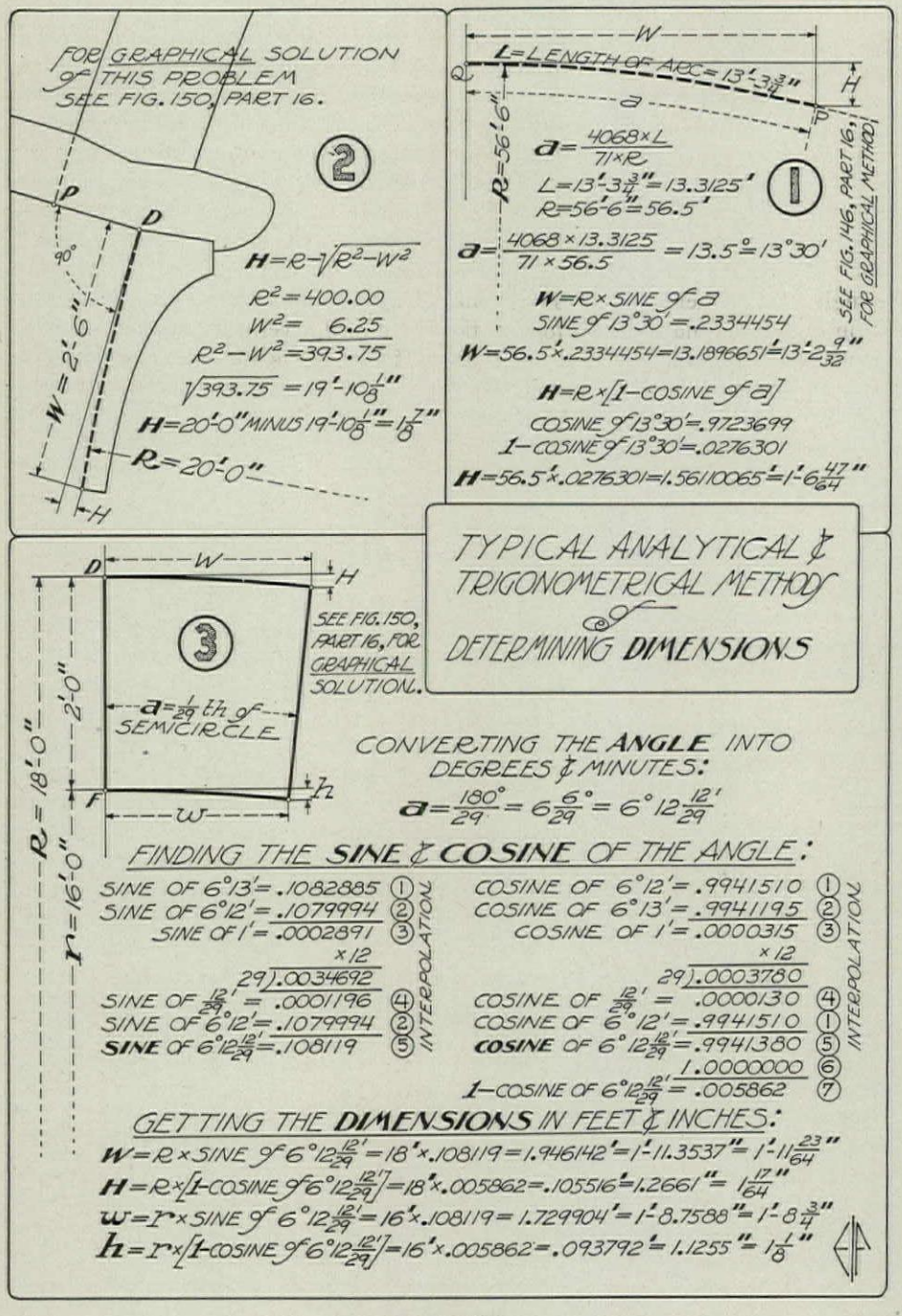


FIGURE 153

racy required in the result. And these points along the curve are located by pairs of *dimensioned* coordinates referred to any convenient point as the origin, the latter being usually taken as the known crown point of the required arc. A *dimensioned drawing* of half the arc then becomes necessary in order that a workman be enabled to lay it out on the job. Figure 152 shows how the required rectangular coordinates of any circular curve are determined and laid off. Two methods are shown: the trigonometrical and the analytical. Certainly, this Figure, and the accompanying simple formulas, should render the process clear. If conditions operate to make the spring line of the arc more desirable as a datum line, then, from the known total height of the arc, merely subtract the ordinate dimensions that are gotten either by Formula 2 or by Formula 4 of Figure 152: the results will be the distances from the *spring* line to the points on the curve, instead of from the tangent datum line drawn through the crown point Q of the arc. The methods of Figure 152 could, of course, also be used to plot long-radius arcs on the drafting board, but the *graphical* methods developed in Part 16, heretofore, are more exact and infinitely more expeditious for these cases. As a matter of fact, the methods of plotting given in said Part 16 could easily be used *on the job* — but, ordinarily, it's too much to expect a building mechanic to have such specialized geometrical knowledge. He wants figures — *dimensions in feet and inches* — not geometrical constructions! So, you see, "figures" are a very essential part of *your* geometry. And that's why I'm telling you how to determine them—in *my* geometry.

Figure 153:

Diagram "1" shows how to determine the rectangular dimensions W and H, which locate a required point P occurring at a definite and known distance L, from a given point Q, along the line of any existing or proposed circular arc; the radius of the arc also being a known dimension. Here, then, the given distance L becomes the known *length* of the arc QP. Now, from an inspection of Formulas 1 and 2, of Figure 152, you can see that the unknown dimensions W and H can be found if the *sine* and *cosine* of angle a can be determined. And you surely know that these required functions can—either directly or by proportionate interpolation—be readily discovered from a ready-made trigonometrical table of sines and cosines, *provided the angle itself is known.* Furthermore, Formula 21, of Figure 151, tells you that this angle can be found in terms of the known length L and the known radius R. Hence, first determine the unknown *magnitude* of the angle a by

means of Formula 21, Figure 151; then, from a trigonometrical table, determine the *sine* and *cosine* of this angle; then, by Formulas 1 and 2, Figure 152, compute the required lengths of the coordinates *W* and *H*. The entire arithmetical process is detailed at Diagram "1" of Figure 153, and, with what has been said, little confusion should be felt in following it through. This problem brings out the fact that, in some cases, one or more preliminary formulas or computations are required in order to materialize the "known" values necessary to the solution of the final formula that yields the required dimensions. Obviously, if the *angular* magnitude of angle *a* had been given instead of the length *L* of its arc, then, by referring to a "trig" table, Formulas 1 and 2 of Figure 152 would have been directly applicable. And, from that, you can see that it would be possible to locate any number of *equally-spaced* points along the line of a circular arc by means of corresponding pairs of *dimensioned coordinates* fixing the angular extent of each portion of the given total arc. This problem, then, is suggestive of the mathematical solutions of several problems that have heretofore been solved much more simply, *on the drafting board*, by the system of graphical cyclometry developed in Parts 14 and 15, and particularly instanced in Part 16 at Figure 146.

At Diagram "2," of Figure 153, an analytic solution is presented of the same problem heretofore solved graphically in Part 16 at Diagram 4 of Figure 150; namely, to determine the rectangular coordinates *W* and *H* for use in plotting the long-radius arc of the back of the bracket. In this alternate solution, herewith, the distance *W*, of 2′-6″, was first "scaled" directly from the scale working drawings, thus becoming a *known* dimension. With this distance known, and with the radius known, Formula 4 of Figure 152 yields the height *H* of 1⅞″—the entire computation being detailed at Diagram "2" of Figure 153.

Diagram "3," of Figure 153, is a detailed trigonometrical solution of the same problem that was worked graphically in Part 16 at Diagram "6" of Figure 150. The problem is to lay off, full size, 1/29th part of a semicircular arch ring of the radii given, but without recourse to the center point of the circle, said point being here assumed as out of reach or inaccessible. Evidently then, the required portions of the arcs of the extrados and intrados must be "plotted." But, first, the two pairs of rectangular coordinates, *W*, *H*, and *w*, *h*, must be determined. In this alternate solution, then, the lengths of these coordinates become required *dimensions*. Also, in order to find the *sine* and *cosine* of 1/29th of 180 degrees, it is necessary to first convert this fraction into degrees and minutes for accurate interpolation of the required trigonometrical functions. The entire process of interpolation is given in the Figure. It's "long-winded" and tedious, but not particularly difficult. Note that the *sine* of an angle *increases* with the increase of the angle, while the *cosine* of an angle *decreases* with the increase of the angle. Hence, in the *sine* computations, item 4 is *added* to item 2 to get the required item 5, while, in the *cosine* computations, item 4 is *subtracted* from item 1 to get the required item 5, and the latter item, subtracted from *unity*, gives item 6 which is the required value of 1 minus the cosine of 1/29th of 180 degrees. Then, by Formulas 1 and 2, of Figure 152, the required dimensions *W*, *H*, and *w*, *h*, are determined as shown by the detailed computations for same in Diagram 3 of Figure 153. You can now compare the final results of the above calculations with the corresponding results yielded by the purely *graphical* method of solution heretofore given in Part 16 at Diagram "6" of Figure 150. If your graphical work has been accurately performed the results of same will be more exact than the results of the above calculations, for the reason that, in the calculations, the decimalized results were converted to the *nearest* 64th of an inch—which is cutting it fine at that! So, don't forget this: *the most reliable check on any calculation is a carefully-drawn geometrical construction.*

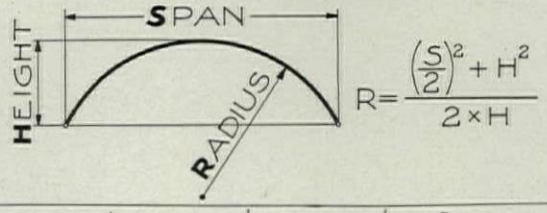
So accustomed are we to handling all computations *decimally*, it has failed to become generally known that there exists an absolutely unlimited number of circular arcs whose three related dimensions—the *span*, *height*, and *radius*—are expressible in "rational" numbers, that is, in exact and finite numerical terms, instead of never-ending decimals. TABLE 5, herewith, records a number of usable arcs having their dimensions so given. And the simple arithmetical equation given at the head of this table proves the commensurability of these three dimensions. The use and value of TABLE 5 should be obvious, but a number of pertinent practical instances will be given, since, surprising as it may seem, no table of this kind has before been made available. The arcs there tabulated vary in height, by small increments, from 1/34th the span up to ½ the span, inclusive, which latter arc is, of course, a semicircle. The fourth column of the table contains the value of the span-divided-by-the-height which, for brevity, will be called "*S* over *H*" as there formulated. This value is given for comparative purposes, as well as to enable the user of the table to readily "pick out" an arc having the desired proportions or having proportions closely approaching those that were assumed for the purpose of fixing the *exact* dimensions. To illustrate: suppose the "design" you are working from shows a segmental arch spanning an opening of 5′-6″, and assume that nothing is operative to fix the height of this arch except appearances, or the whim of the designer. All right, the height of the arch "scales" about 11″. Dividing the fixed span of 5′-6″ by 11″ gives 6 as the "*S* over *H*" ratio. Hence, glancing down the "*S* over *H*" column of the table, the ratio 6 is found exactly. It indicates an arc whose exact relative dimensions are: span, 6; height, 1; radius, 5. In other words, the height remains 1/6th the span, or 11″ as "scaled," and the required radius-dimension then becomes 5 times this height, which is 4′-7″ *exactly*. In this case, the dimensions are not only commensurable with each other, but they are also commensurable with *foot-rule* units. Hence, no "conversion" is required. And you will find that this often occurs, but not always. Suppose you are laying out the plan of a bow window—a

circular segmental bay—and that you desire it to have a width of about 8 feet, and a projection of about 2½ feet. Here, the width is the "*S*pan," and the projection is the "*H*eight." Wherefore, the trial "*S* over *H*" ratio becomes 96 inches divided by 30 inches, equalling 3-1/5. Again TABLE 5 contains this exact ratio, thereby designating an arc whose finite relative dimensions are: span, 160; height, 50; radius, 89. Hence, for a fixed span of 8′-0″, the height remains 2′-6″, and the required radius becomes 89/160ths of the span, or 89/160ths of 96 inches, which is 53-2/5 inches, *exactly*. However, the 2/5ths of an inch is not a dimension associated with foot-rule measurement, hence must be "converted" thereto before going on the working plans as a *dimension*. And this conversion always results in an approximation. Ordinarily, any lineal dimension that splits a sixteenth of an inch should be—and in most cases can be—avoided on the working plans. In the dimensioning of curves, however, where the required dimension is determined by *calculation from other fixed dimensions*, accuracy demands that a sixteenth of an inch must often be "split" in half or, in exceptionally small dimensions, that it should be quartered. In other words, in these cases, where either a decimal or a fraction foreign to the foot-rule must be "converted," it is permissible—in fact, necessary—that the conversion be carried to the nearest 32nd of an inch, or possibly to the nearest 64th of an inch—depending on the conditions of the case. The mechanic's rule ordinarily contains no unit finer than a sixteenth of an inch, but a half of this, or even a quarter of it, can be "estimated" therefrom with fair accuracy—and risibility! Now we can get back to that circular bay of which the required radius was found to be 53-2/5″. Consulting the conversion scale given in Part 9, it is at once seen that the nearest rule-equivalent to the fraction 2/5ths, or 40/100ths, is 13/32nds. Wherefore, the required radius-dimension becomes 4′ 5-13/32″, *approximately*, for a fixed span of 8′-0″ and a fixed height of 2′-6″.

Now, since the *proportions* of the above arc, as given exactly in TABLE 5, are: span, 160; height, 50; radius, 89; it is evident that you can call these numbers *inches, feet, quarter-inches, meters, centimeters, or any other lineal denomination*, and that they would *then* become exact *dimensions*. Calling them *inches*, and then taking 9/16ths, say, of each, you get: span, 7′-6″; height, 2′-4⅛″; radius, 4′ 2-1/16″, *exactly*. Or, taking 19/32nds of each, you get: span, 7′-11″; height, 2′ 5-11/16″; radius, 4′ 4-27/32″, *exactly*. Again, taking ⅝ths of each, you get: span, 8′-4″; height, 2′-7¼″; radius, 4′-7⅝″, *exactly*. Any one of these exact triads might have been used for the *dimensions* of the above segmental bay. So you see, by a little simple "juggling" of figures, you can, by means of TABLE 5, discover an arc of almost any required or assumed ratio of height to span, or height to radius, that will yield its dimensions not only in exact and commensurable terms but also in terms associated with *rule measurement*. And no *formula* need be solved to determine these dimensions.

TABLE 5

EXACT PROPORTIONATE DIMENSIONS OF CIRCULAR ARCS IN COMMENSURABLE TERMS



SPAN	HEIGHT	RADIUS	$\frac{S}{H}$
34	1	145	34
30	1	113	30
26	1	85	26
48	2	145	24
22	1	61	22
40	2	101	20
18	1	41	18
32	2	65	16
14	1	25	14
24	2	37	12
88	8	125	11
10	1	13	10
72	8	85	9
78	9	89	8-2/3
16	2	17	8
66	9	65	7-1/3
56	8	53	7
120	18	109	6-2/3
6	1	5	6
176	32	137	5-1/2
96	18	73	5-1/3
130	25	97	5-1/5
40	8	29	5
42	9	29	4-2/3
144	32	97	4-1/2
110	25	73	4-2/5
210	49	137	4-2/7
8	2	5	4
182	49	109	3-5/7
90	25	53	3-3/5
112	32	65	3-1/2
30	9	17	3-1/3
160	50	89	3-1/5
154	49	85	3-1/7
24	8	13	3
234	81	125	2-8/9
70	25	37	2-4/5
48	18	25	2-2/3
126	49	65	2-4/7
80	32	41	2-1/2
198	81	101	2-4/9
120	50	61	2-2/5
286	121	145	2-4/11
168	72	85	2-1/3
224	98	113	2-2/7
288	128	145	2-1/4
2	1	1	2

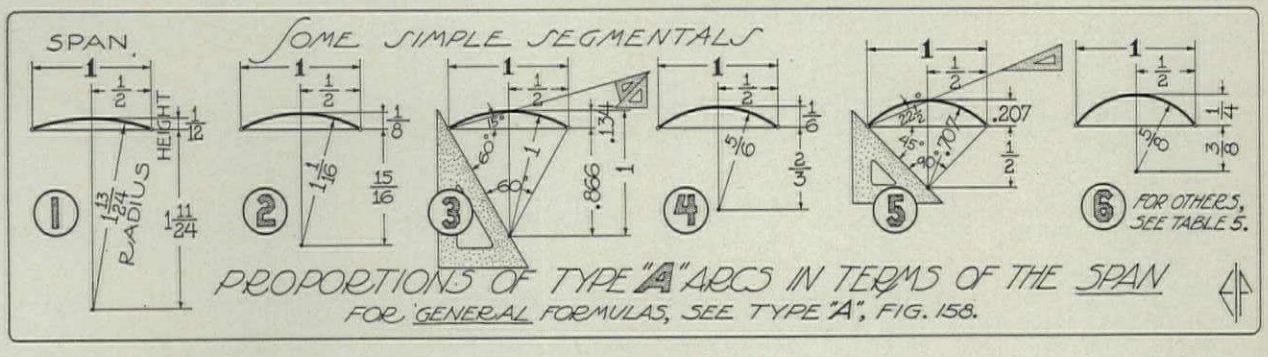


FIGURE 154

In case *both* the span-dimension and the height-dimension of a circular arc are unchangeably *fixed*—either from architectural or structural considerations—and in case TABLE 5 does not contain the *exact* value of "*S* over *H*," then the radius-dimension correspondent with the fixed span and height will have to be found by solving the *formula* for same given at the head of this table. As an example: suppose the top member of an arched truss has a fixed span of 45′-2″, and a fixed rise of 5′-6″ at the center of the span; what dimension would you mark on the working drawings as the required radius for an arc of this span and height? Here, the ratio "*S* over *H*" is 8-7/33. But TABLE 5, column four, does not tabulate this particular ratio. If, however, the height were changed to 1/8th the span, that is, if it were made 5′-7¾″ instead of 5′-6″, then the radius would become *exactly* 17/16ths of the span, or 47′-11⅞″, since, for a value of 8 for "*S* over *H*," TABLE 5 gives the following proportions: span, 16; height, 2; radius, 17. Nevertheless, to illustrate the problem stated, I shall assume that the change in height would not be made, that it *could* not be made. Then, by the formula given at the head of TABLE 5, the required radius, *R*, is seen to equal the sum of the squared half-span and squared height, divided by twice the height. Half the span is 22′-7″, which is 271″. The height is 5′-6″, which is 66″. The square of 271 is 73441, and the square of 66 is 4356. The sum of these squares is 77797. Dividing this by 132—that is, by twice the height in *inches*—gives 589 49/132″, or 49′ 1-49/132″, as the required length of radius, *exactly*—since no decimals have been used in the computation. However, the 49/132nds of an inch is not a dimension associated with the foot-rule and, therefore, must be converted to the nearest rule-equivalent, which is found to be 3/8″. Hence, while the length of the radius has been found to be 49′ 1-49/132″ *exactly*, yet, due to our clumsy system of measurement, the dimension must go on the plans as 49′-1⅜″, an *approximation*. But, while these approximations are near enough for most practical purposes, they can, as I have shown, be easily avoided by an exceedingly slight change in one or another of the known or assumed dimensions. Moreover, such a change will avoid all "formulated" calculations, since TABLE 5 contains such a wide range of ready-to-use triads. Now, you are still wondering why I worked out the above problem in *inches*—whole numbers—instead of doing it in the "customary" way with *feet and decimals thereof*. Well, in the first place, it's just as simple, possibly more so; and, in the second place, it shows that the *radius* is expressible in finite numerical terms; and, in the third place, this *exact* result *might* have been such as to also be exactly expressible in units of foot-rule measurement. Reasons enough: but decimalized calculation has become a *habit*. So here's the same problem, solved in the "customary" way—take your choice! Half the span is 22′-7″. The height is 5′-6″. From a table of *squared dimensions*—which it is plain foolish *not* to possess—the square of 22′-7″ reads 510.0069, in square *feet;* and the square of 5′-6″ reads 30.25. The sum of these squares is 540.2569. Dividing this by 11—by twice the height in *feet*—gives 49.1142 *feet* as the required radius. Multiplying .1142 feet by 12 makes it equal 1.37 *inches*. And .37 inches, converted to the nearest rule-equivalent, is 3/8″. Hence, as before, the radius *dimension* becomes 49′-1⅜″, *approximately*. Same *approximate* result, true enough. But you *now* know that it *could* be found *exactly—but not by decimal calculation*, which latter, in itself, is

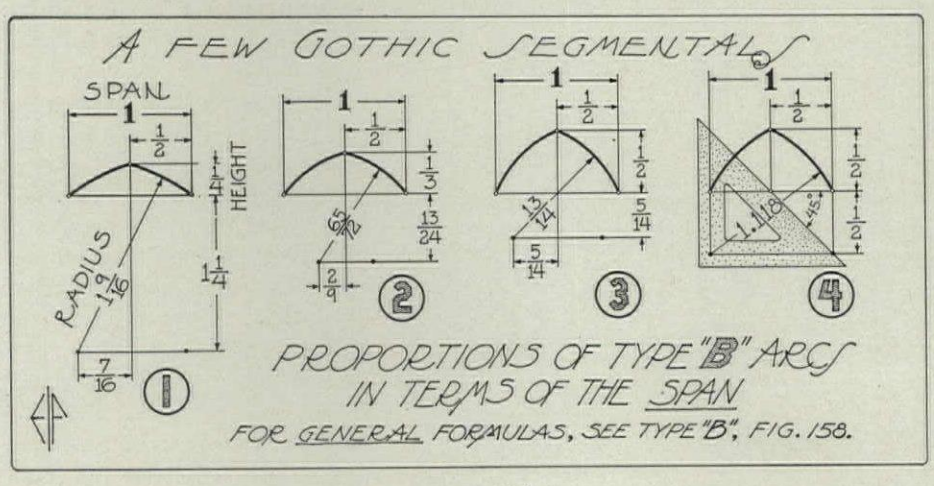


FIGURE 155

usually an approximation.

Later, in this Part and in Part 18 following, I shall record all formulas required for the discovery of *any* unknown dimension whatsoever having to do with every simple, combined, compound, or reversed circular curve encountered in architectural and structural drafting. After you are through with these two Parts of this work you will know right where to *find* the particular formula required, as well as how to *apply* it, in the working out of any drafting-room problem in figured dimensioning that may thereafter arise. But I am going to give you some more instructive and ready-to-use data and diagrams first, so that, though the *general* formulas to follow have been reduced to their simplest forms and require no knowledge of "high brow" mathematics in solving them, they will not have to be resorted to except in uncommon cases.

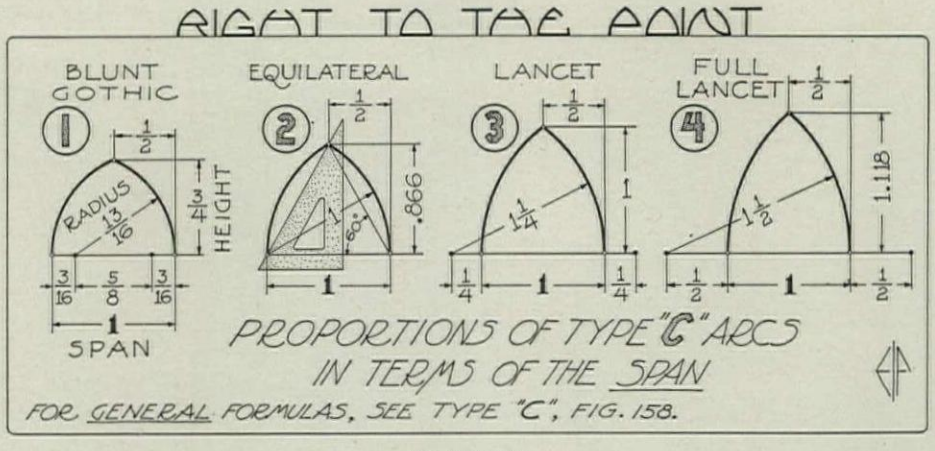


FIGURE 156

Again reverting to a discussion of TABLE 5, you now know that each triad of integers there set down —that is, the three whole numbers representing, respectively, the span, the height, and the radius—are relative *proportions* that may not only be exactly expressed *in terms of one another* but that may also be assigned any lineal denomination at all and still yield commensurable values—*exact dimensions*. Take the first triad: span, 34; height, 1; radius, 145. Then, in terms of the *span*, the height is 1/34th, and the radius is 145/34ths. In terms of the *height*, the span is 34, and the radius is 145. In terms of the *radius*, the height is 1/145th, and the span is 34/145ths. All of which applies to this one particular triad whose "*S* over *H*" ratio is 34. And similarly for the other triads. Again, let the numbers of the first triad each represent the same number of, say, *32nds of an inch*. The *span* then becomes 1-1/16"; the height becomes 1/32"; the radius becomes 4-17/32", all *exactly*. Multiply these dimensions by *any whole number whatsoever*—2, 3, 4, 5, 6, etc., etc.—and each resultant arc will remain of the same proportions and have its dimensions in *foot-rule measurements*—exactly so. And the same process holds true of every arc there tabulated. In other words, a table of dimensioned arcs could readily and quickly be compiled from *each triad* of TABLE 5, and you could then immediately pick therefrom, by mere *inspection*, the three dimensions of any arc that would serve your purpose. You have probably discovered that TABLE 5 is an extension of the system of "commensurable coordinates" originally established in Part 16 at Diagram 5 of Figure 147, and there referred to. And you also may discover that TABLE 5 has been made good use of in fixing the exact related proportions of most of the simple, combined, and compound circular arcs exemplified in the next four Figures as well as in some similarly worked-out examples given in Part 18.

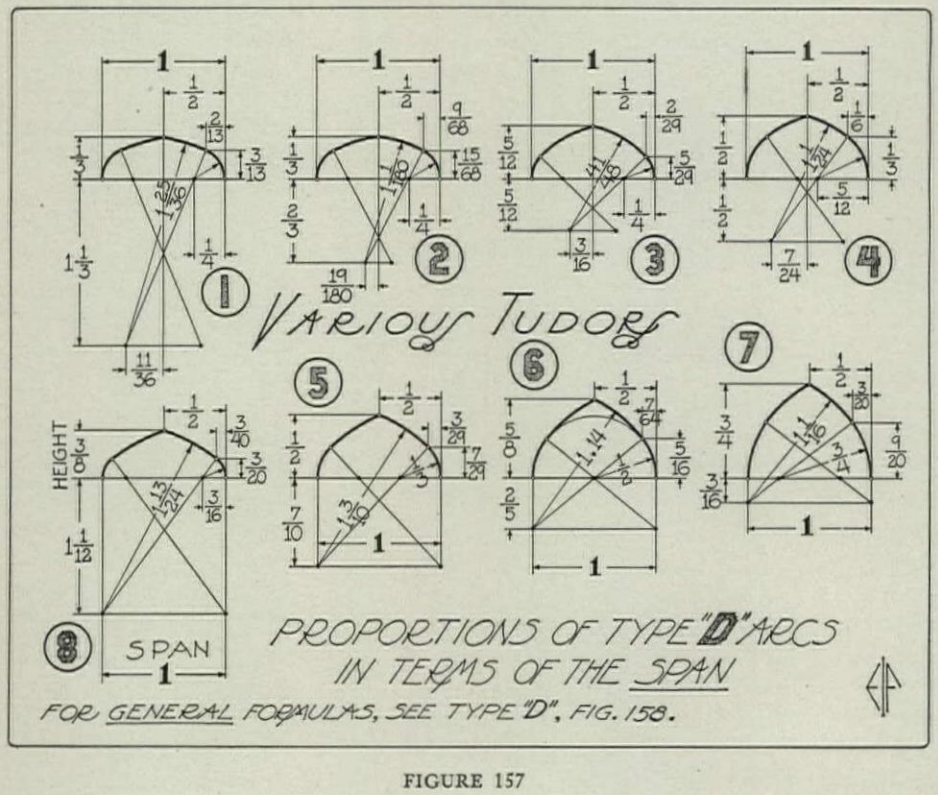


FIGURE 157

Figures 154, 155, 156, 157:

Words are superfluous. The *work* has all been done. Merely "pick out"

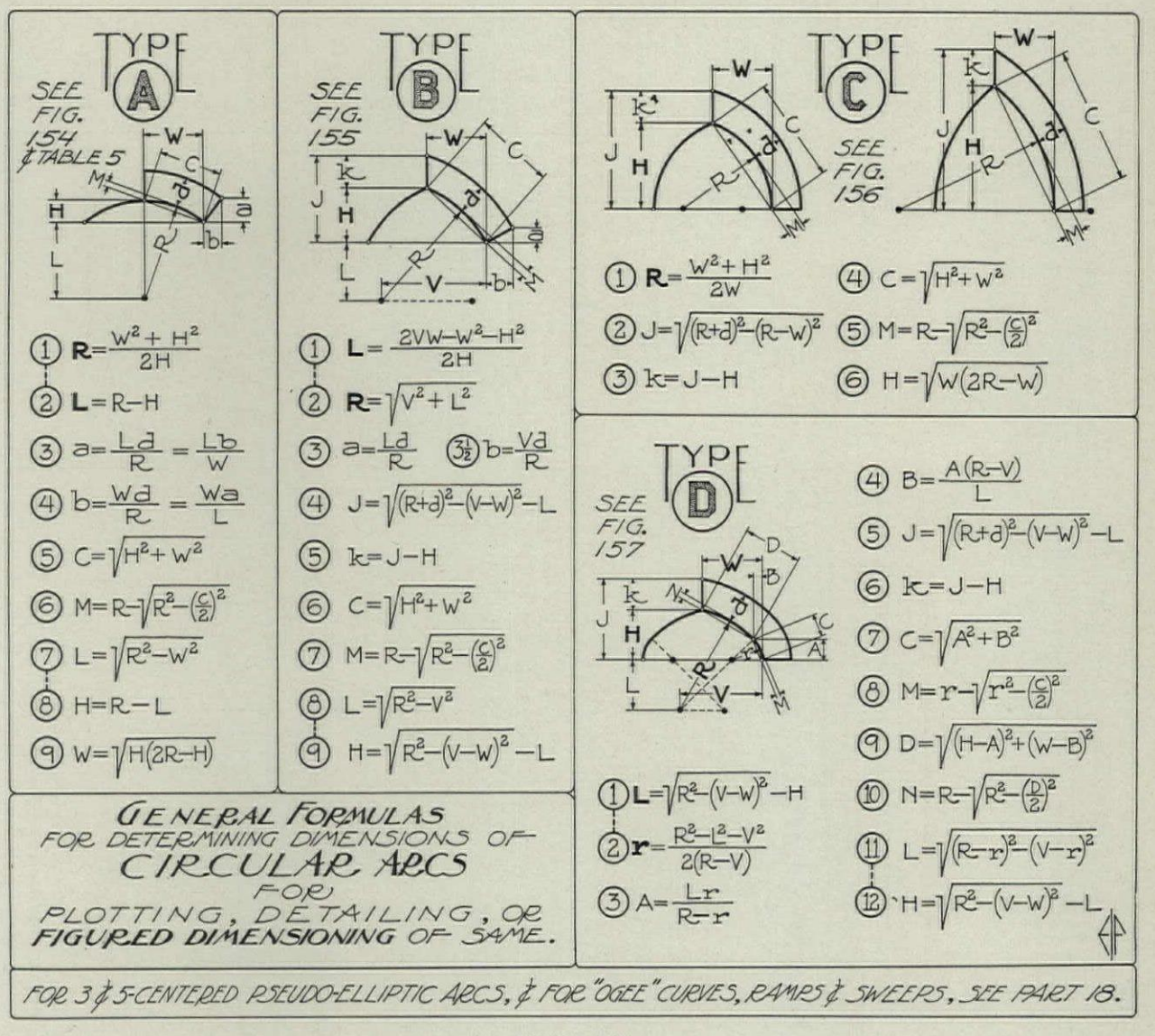


FIGURE 158

the particular alluring shape that satisfies the conditions of the case, or that fulfills your æsthetic hankerings. Multiply the numbers there given by the known or assumed length of *SPAN*, and thereby forthwith "discover" the unknown dimensions that you need. You may have to "convert" some of the results to rule-measurement—but that's easy. Personally, "just between you and me and the gate post," that plump Tudor carrying number "2" of Figure 157 "takes my eye." Guess I'll pick on *that* one. Let's see: the span I'm working to is 7′-6″—might be an inch more or an inch less. But 7′-6″ is 90″—O.K. This makes the height 1/3rd of 90″, or 2′-6″—O.K. And it makes the haunch radius ¼ of 90″, or 1′-10½″; and makes the crown radius equal 90″ *plus* 1/180th of 90″, or 7′-6½″—O.K.! And it makes the centers of the crown arcs 2/3rds of 90″, or 5′-0″, below the spring line, and 19/180ths of 90″, or 9½″, each side of the center line—O.!K.! Now *you* try your luck. And in Part 18 you'll find some 3-centered and 5-centered "almost" elliptical curves that you can dimension *just as easily*. Also, you'll there find some usable *reversed* curves worked out in the same manner—eyebrows, pediments, what not! Now for those *formulas* I promised a while back—some of them—the ones that apply to the four types of circular arcs covered in this Part: namely, types "A," "B," "C," "D." The others are in Part 18.

Figure 158:

The unusual cases now come under consideration: the cases in which one or more "known" dimensions are so unalterably *fixed* that it becomes necessary to find the "unknown" required dimensions by *formula*—by analytical geometry. But, as I have said before, the "analytical" part is *buried deep*. Only the final formulated usable *results* are here recorded—not their analytical derivation. I've reduced an abstruse and highly-involved subject to one of plain everyday arithmetic, requiring no such knowledge higher than squaring a number or extracting its square root—no, you don't even need *that* much knowledge, for tables listing these values for both abstract numbers and *dimensions in feet and inches* are readily procurable. If you can manipulate the "slip stick"—all right, if you have good "eyesight." There's thousands of slide rules

in use—and millions of calculations made *without* them! No, all you need is a scratch-pad, a pencil, a table of squares, *and a knowledge of how to read a formula.* A "formula" is merely a concise *form* of stating a *rule*—nothing else. Substitute the known numerical quantities for the letters *representing* them, making sure that they are all of the *same denomination.* You can't multiply apples by onions, nor feet

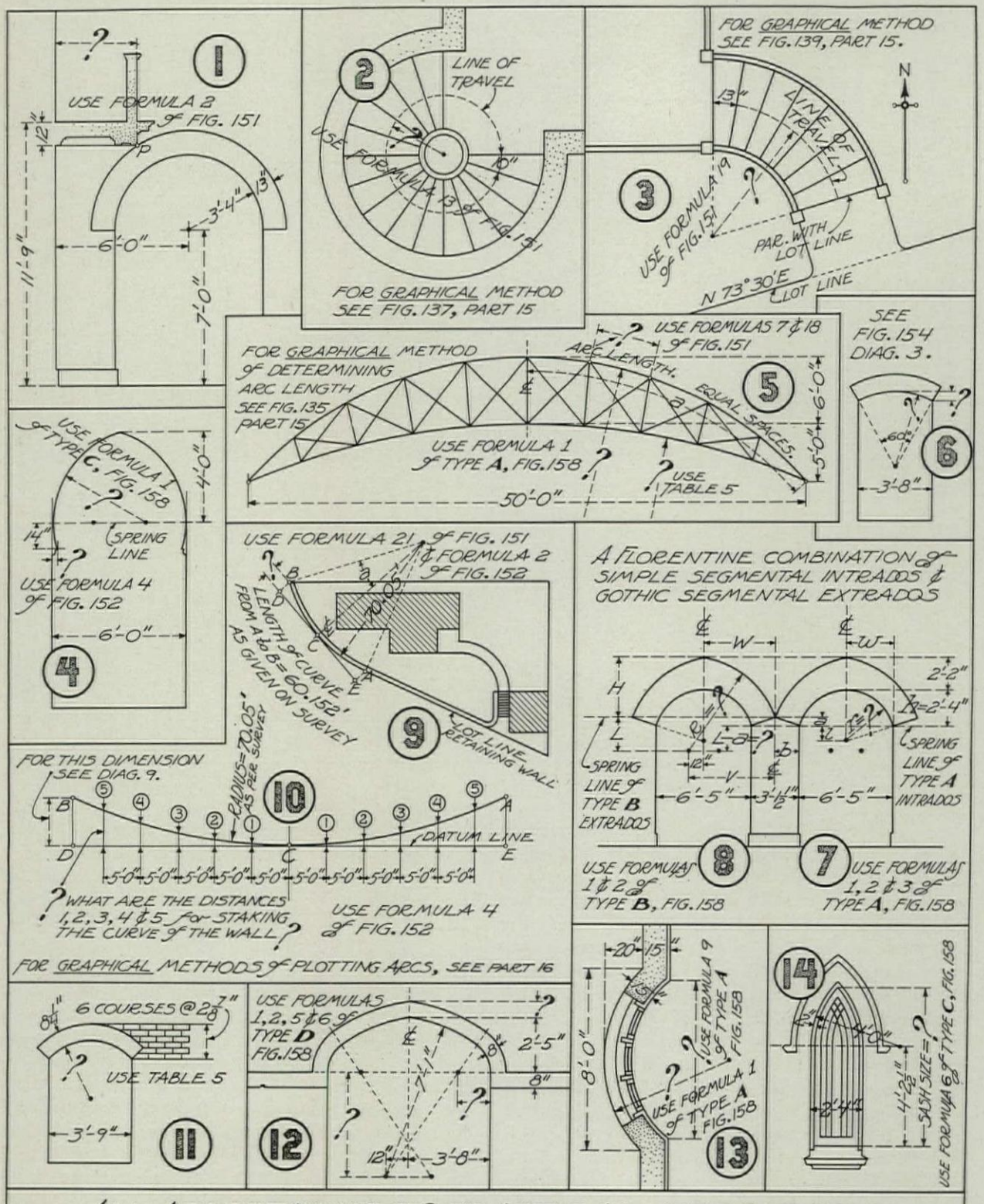


FIGURE 159

by inches—you are supposed to have learned *that* in school—but you might have forgotten it. Next, perform the indicated arithmetical operations, remembering that, where *no* arithmetical sign separates any two letters, or any one letter and a quantity in a parenthesis, or any two quantities each in a parenthesis, or any one quantity and a quantity under the square root sign—in short, where the sign of operation is *omitted—multiplication is always inferred.* Operations indicated in parentheses should be performed *first;* then the inferred operations of multiplication if there be such; then the operations of addition and subtraction; and, finally, the operation that produces the *one* unknown quantity—the solution of the equation. Then, no doubt, this final result will have to be "converted" to foot-rule measurement. You know how. The full process of solution requires care, and it may be distasteful: but it is neither difficult nor "too much to expect of a mere draftsman." On the contrary, the ability to *solve* these equations, when the occasion demands, goes hand-in-hand with the draftsman's ability to "draw": for how can he *draw working plans* without placing thereon the *figured dimensions* required by the builder? Moreover, any draftsman that does not have to "holler for help" or "call in the engineer" to furnish an unknown but required dimension certainly goes up a notch on the *pay roll.*

FORMULAS FOR TYPE "A" ARCS, Figure 158. Type "A" arcs are simple one-centered segmentals. They are the basic component arcs forming all other circular types. In their *simple* form, here designated as Type "A," they repeatedly occur in building construction in arches, architraves, bay windows, pediments, arched ceilings, roofs, roof truss members, etc. In the explanatory diagram—as in all such type-diagrams accompanying the formulas of this Figure—the "known" dimensions that are ordinarily given, fixed, or assumed, are indicated by the *heavily-drawn reference letters,* while the "unknown" dimensions ordinarily required to be found from these known ones are also so indicated in the *formulas.* Other formulas are given for determining various other dimensions of the pictured arcs. While these other formulas—the greater bulk of them all, in fact—will not often be required, yet they will, on occasion, be found of much value in determining the various chord lengths and heights, points of inflection or of compound curvature, etc., for the purpose of laying down on the detail board any required *portion* of the curve in case it is of so great a radius as to necessitate the "plotting" of same by some one of the various methods heretofore given in Part 16. In fact, for one purpose or another, every formula here and hereafter given will sometime be found of use. For Type "A" arcs, the figured dimensions usually needed on the working drawings are: the span, or half-span W; the height H; the radius R; and, advisedly, the distance L from spring line to center of arc. The known dimensions, W and H, are usually fixed by a consideration of design or structure, or else arbitrarily assumed. From these two dimensions, the others are then determined. Formula 1 yields the required length of radius directly, and you will note that this is the same formula as given at the head of TABLE 5, since W here represents the *half* span. Formula 2 then yields the distance L merely by subtraction of the given height from the now-known radius. In the case of an arch ring, the dimensions a and b may become desirable, either for placement on the drawings or for properly detailing a skewback from which the arch springs. Formulas 3 and 4 yield these dimensions, two forms being given for each, the distance d being the width of the ring or the radial distance between the concentric arcs of same. Formulas 5 and 6 determine the chord and rise of *half* the arc. And, if the radius and half span are the "known" values, Formulas 7 and 8 will determine the distance L and the *height* of the full arc, H. Again, it is sometimes necessary to determine the extent of the span, or of the half-span W, from a known height and radius. The half-span is yielded by Formula 9 and, of course, the result is merely doubled to get the required *full* span.

FORMULAS FOR TYPE "B" ARCS, Figure 158. A Type "B" arc is a pointed and symmetrical combination of two simple segmentals *centered anywhere below the spring line,* as the Diagram indicates. An *arch* of this type is termed a Gothic segmental. An excellent use of an arch of this type is for "backing up" a *full* Gothic arch, point-to-point, so as to allow the full-pointed doors of the main outer archway to swing inward through a deep reveal without interference. It finds use in many other numerous instances where "headroom" is limited, and yet a Gothic-style arch is demanded. Type "B" arcs also form the *extrados* line of many Florentine arches. With the height H, and half-span W, fixed by the exigencies of the case, the arc of which C is the chord is then *drawn* from such a center point located on the perpendicular bisector of this chord as will give the arc the "appearance" desired. The distance V, from this thus-determined center to the farther jamb line, or to the perpendicular "dropped" from the farther spring point, is then closely "scaled" and, thereby, established as a fixed known *dimension.* The distances V, W and H, are then the "known" quantities, and, from these, the required "unknown" quantities L and R are yielded by solutions of Formulas 1 and 2, respectively. Formulas 3 and 3½ then give the skewback cut. Formula 4 gives you the over-all height from spring line to point of extrados, and Formula 5 yields the depth of keystone on the center line of the arch, or the *vertical* distance between any two concentric arcs on said center line—the radial distance, d, between concentric arcs being a "known" dimension. If the length of the chord C, and its coordinate height M, are needed, Formulas 6 and 7 will accommodate that need. In case the height H is not a fixed or known dimension but, instead, the distance V, the half-span W, and the radius R, are given, assumed, or "scaled," then Formulas 8 and 9 will establish the corresponding unknown but necessary values for L and H. In rare cases, the values of W, H and R may constitute the set of known or assumed dimensions. Since these dimensions fix *both extremities* of

the arc as well as its *radius*, the center of the arc is virtually determined, since it can readily be found by crossed arcs of the given radius R, swung from the known extremities. In other words, the coordinates L and V are not, in these cases, absolutely essential dimensions: the required arc can readily be laid out without them. However, if desired, the dimensions L and V can be determined from Formulas numbered 2 and 3 for TYPE "M" arcs, which latter will be found at Figure 168 in Part 18 following. In both types, the reference letters are maintained identical.

FORMULAS FOR TYPE "C" ARCS, Figure 158. A Type "C" arc is a pointed and symmetrical combination of two simple segmentals *centered anywhere on the spring line*, as the Diagrams depict. Type "C" arcs comprise all the full Gothic shapes—from "blunt" to "lancet," inclusive. And they are also employed in Moorish arches and domes. From the known half-span W, and the known or assumed height H, the unknown length of radius R is at once discovered by doing what Formula 1 tells you to do. Distances J and k will become dimensions by solving Formulas 2 and 3. The chord and rise of either one of the simple *component* arcs will likewise become known by means of Formulas 4 and 5. These latter dimensions are usable, at times, in determining the radii of tracery or foils occurring within the opening or along the intrados of a Gothic or Moorish arch. And Formula 6 materializes the height-dimension H, in case R and W are the fixed or assumed dimensions instead of H and W.

FORMULAS FOR TYPE "D" ARCS, Figure 158. Type "D" arcs are *all* the "Tudors"—their shapes are legion. They are also found in Moorish designs. These pointed and symmetrical arcs are compounded from four simple segmentals swung from three or four centers. The haunch arcs are always *centered on the spring line*, and the crown arcs are *centered anywhere below the spring line*. The haunch and crown arcs meet tangentially, forming a smooth compound curve from spring line to point. The one case of a *three*-centered Type "D" arc has been illustrated at Diagram "6" of Figure 157; the opposite haunch arcs there being arcs of the same semicircle centered at the rectangular crossing of the spring line and axis. All other shapes of this type are *four*-centered. The Formulas given in Figure 158 for Type "D" arcs are, however, perfectly *general*, regardless of whether three or four centers are employed. Formulas 11 and 12 may be used *directly* in the rare 3-centered case. But, in other cases, the span, or half-span W, and the height H, are usually predetermined by structural considerations or by "design." Here, then, we have *two* unknown quantities to determine, the haunch radius and the crown radius, neither of which is dependent upon anything whatsoever except H, W, and—"looks." Mathematics becomes helpless to cope with such a situation. However, once either the one or the other of these radii becomes decided upon, then, *undeniably*, mathematics must assuredly be capable of determining the *one* unknown radius. Hence, the outline, say of the proposed *arch*, is first tentatively sketched in; then altered one way or another until it looks like one you saw in a book on "English Manors"; then the crown arc is smoothed up with the compass by jockeying the center around until the instrumental arc fairly coincides with the sketched-in one. In other words, *you*—not mathematics—must determine the compass-center for the crown radius R. The *length* of this radius, and also the distance V, are then "scaled" and thereby established as *known* dimensions. Whence, Formulas 1 and 2 then yield the required *unknown* dimensions, L and r, that are dependent upon, and vary with, R and V. For a fixed span and height, to determine the dimensions of a four-centered Tudor arch in any other manner than that just given, leads into such a tangle of mathematics as to be utterly impractical. But, if some of you analytical "wizards" want to exercise your prowess, just derive a general formula for the *crown* radius, R, assuming H, W, r and V as "known" values. It's a "terror"—mile long. But, like a lot of other mathematical terrors, there is an exceedingly simple *geometrical* construction for subjugating it. I'll show you this in a later Part, for it will prove very convenient in establishing the proportions that "look right," and, from which, the crown radius R, and the distance V, can then be "scaled," as has been noted, for the purpose of determining all dimensions in an exact and simplified manner. Please take note, however, that the "scaling" process is *not* an approximation: it definitely establishes such-gotten dimensions as *known*—that's all—and from which, the others are then made *determinable by formula*. Well, Formulas 1 and 2, herewith, have determined the length of the haunch radius r, and the distance L of the crown center below the spring line. These, with the ones already fixed, assumed or "scaled," are all that will ordinarily be required on the working plans. On occasion, however, it may become advisable to *definitely* locate the points of inflection by the rectangular dimensions A and B. These are given by the very simple Formulas 3 and 4. The over-all height J, in the case of an *arch*, and the keystone depth k, are yielded by Formulas 5 and 6. The two pairs of Formulas, 7, 8, and 9, 10, give the chord lengths and the heights of the simple component arcs making up the total compound and combined curves. And, finally, Formulas 11 and 12 will determine the distance L, and the height H, respectively, in case the other dimensions R, r, W, and V are given, assumed, or determined by *scale*.

Figure 159:

Now let's see what kind of a *draftsmatician* you have become—or are!

Work out every "questioned" dimension so indicated on the various Diagrams of this Figure. They are all intensely practical and pertinent *drafting-room problems in dimensioning*. And they can all be readily solved by the information heretofore herein given. Determine the required dimensions to the nearest 32nd of an inch. Part 18, along with some more "geomathematics," contains all answers to the problems given in Figure 159.

DETAIL OF DRAWING BY CECIL C. BRIGGS OF STOCKHOLM CITY HALL

REPRODUCED AT HALF ORIGINAL SIZE

PENCIL POINTS SERIES
of
COLOR PLATES

This detail of the drawing by Cecil C. Briggs, Fellow in Architecture of the American Academy in Rome, shows something of the technique employed and also gives a better idea of some of the detail of the building. The quality of the settling washes is quite apparent, even at half the size of the original, and the careful draftsmanship throughout is evident.

TOWER OF CITY HALL, STOCKHOLM—RAGNAR ÖSTBERG, ARCHITECT

FROM A DRAWING IN COLOR BY CECIL C. BRIGGS

PENCIL POINTS SERIES
of
COLOR PLATES

This plate shows a greatly reduced reproduction of a drawing in color made from accurate field notes by Cecil C. Briggs as a part of his study as Fellow of the American Academy in Rome. The original measures 46" x 80", so in order to give an adequate idea of the technique as well as of the whole composition it was necessary to reproduce a portion at a larger scale. This portion forms the other color plate in this issue. The drawing was made on white paper with washes of transparent water color over a complete preliminary line drawing in dilute ink.

Impressions of Modern Architecture

3—The Advent of the New Manner in America

By William Ward Watkin

Editor's Note:—*This is the concluding lecture of a series of three delivered by Professor Watkin last year at Rice Institute, Houston, Texas. The first and second appeared in the May and June issues. We recommend to all designers that they read the whole three lectures carefully for we feel that they furnish a sane and sound basis for the approach to the modern design problem. The illustrations are from black and white drawings by Claude E. Hooton. The lectures are published here by permission of the Rice Institute authorities.*

We have traced the cause of the restive spirits in architecture through the nineteenth century, in their romantic movements and in their realistic movements; their storming of the established powers of classic tradition, which had assumed the right to honor; and we have found that in the Europe of today the modernists, armed with the logic and necessity resulting from post-war economy, have demanded the discard of the costly costume of the past and are substituting more and more clear, clean, refreshing design. For them there has been an architectural house-cleaning of a great and sweeping nature. New buildings are emerging free from ornament, bare of detail, but with greater romance and meaning in their composition and reaching toward a new beauty, which is within the appreciation of the people and in spirit with the new age.

What do we find on our own shores? What is the nature of the advent of the new manner?

Abroad it began in post-war housing needs and in relatively smaller buildings. It sought scientific application of the modern spirit to the dwellings of man. It offered better arranged, more comfortable, simpler interiors for the use of the people and in reaching maximum comfort within minimum expenditure, by means of more studied structure, it attained an increasing acceptance and popularity. With America the modern movement has practically left the housing field untouched. It appears with us, not gaining momentum from the lesser works upward, but from the greater works downward. As a new spirit in design, it is becoming known to us through the medium of the skyscraper, our most typical American building, and so downward through apartments, schools, hotels, department stores, club buildings, and occasional lesser buildings.

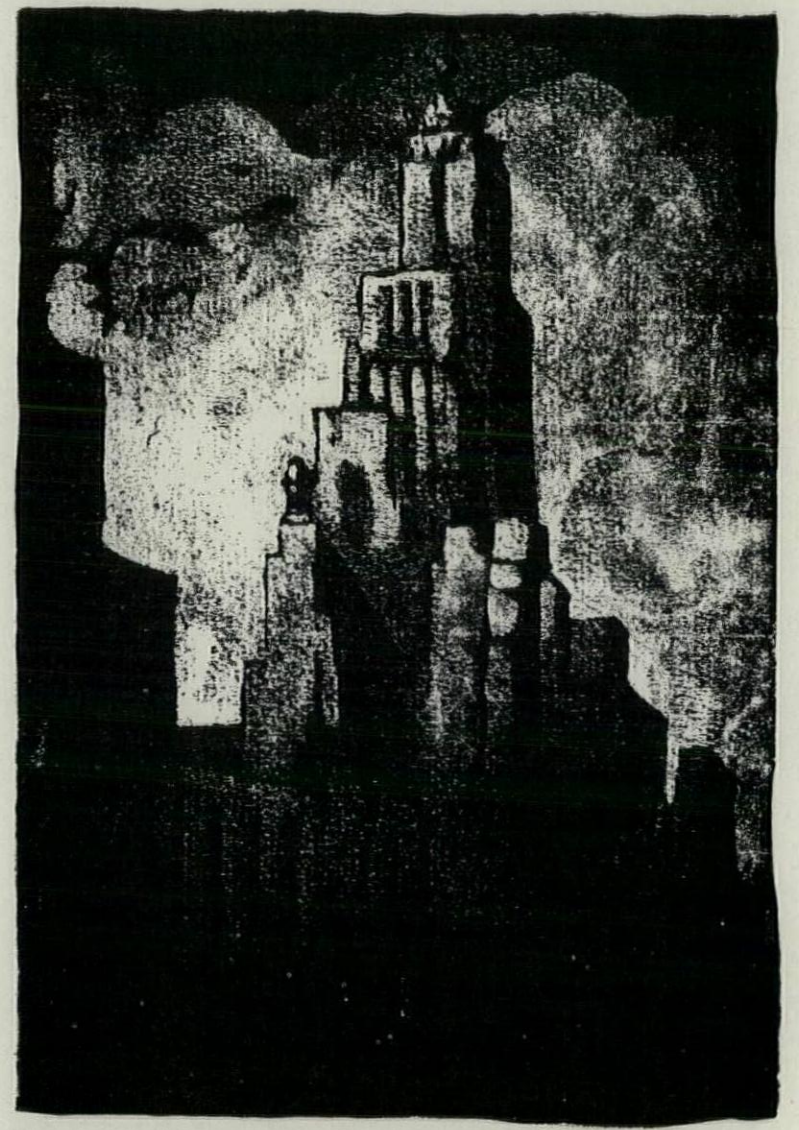
The reason for this we can reach with relative ease. For America the classical tradition of the Revolutionary and Post-Revolutionary days formed a background of conservatism and a natural trend for style and its refinements. Beginning as a vast continent devoid of artistic tradition, architecture was the first of the arts to have expression.

From the beginning we were to be grouped clearly among the conservatives. For us architecture was not an inherent possession, with centuries of tradition behind it. The later Georgian, proud, self-assertive architecture of extreme formalism had come to our shores in the Colonial Period. Its expression had been accompanied by conscious pride and historic refinement. Its forms were planted upon the public consciousness in architecture, so far as we had consciousness in architecture in this country, and in every successive period the classical tradition extended the taste for an arranged, refining touch which permitted more and more the adaptation of that tradition to buildings of a new type, and finally to the growing architecture of steel and concrete and the accompanying mechanical powers.

The formula of our architects in their education and by their practice was the securing of an arranged solution to be composed from elements originally characteristic of the architecture of Rome and successively developed with decreasing power, through the Renaissance, and even more directly through the medium of the Ecole des Beaux Arts. A new civilization accompanied by vast development of industry and commerce, with vastly enlarged flexibility of structural elements, was growing toward an expression of buildings of great height and daring. These clearly indicated a more direct solution, a greater romance as well as a greater realism than the formula of the past provided. They clearly suggested new and vital design sensitive at once to the simplicity and the immensity of their nature. The old manner must become more liberal and seek the power of creative design, or give way to a new manner. I feel this was evident even to the most conservative, yet the nature of our tradition in architecture feared innovation and originality as the greatest of sins.

In spite of the works of the restive spirits in the Gothic revival of the middle of the nineteenth century, the romanticism of Richardson, the realism of Sullivan and Wright, and the mediævalism of the later Gothic group, the classical tradition continued to find ever increasing favor and to add more and more glory to our early twentieth century cities. The classical tradition came to monopolize the field of public and governmental buildings and to be the most united and powerful influence for the architectural future of America.

PAN-HELLENIC BUILDING, NEW YORK
JOHN MEAD HOWELLS, ARCHITECT



TYPICAL CONTEMPORARY CITY BUILDING
SHOWING TENDENCY OF UNPLEASANT RECESSIONS

With the close of the war, America faced no condition parallel with Europe in architecture. No rigid economy lay before us. Vaster wealth than we had ever known had been amassed. Vaster industrial development had arisen from the evidence of our power in war industries. The years of building cessation, in so rapidly growing a country, left more to be built than ever before within so short a period, and more wealth to be used in building it.

Under such demands for architectural service our architects found themselves in no situation similar to that of architects abroad. For the architects abroad petty building opportunity alone existed through which they might achieve worthy architectural position and distinction. Here the opportunities were vaster and more luxurious than ever before. Neither did we have to analyze structure for economy in new and simple methods and materials, and so arrive at new and satisfactory solutions. We had no similar experience in the interruption or change of social order and political structure. In other words, we might go on in our accepted manner more powerfully and with greater means at our disposal.

When vast amounts of architectural work are waiting the architect's service, there is not the inventiveness, resourcefulness, or intense analytical design, which more restricted and more difficult conditions provide. The tendency is a refined mediocrity. Therefore, modernism appeared only in a few modish importations of the futuristic style from abroad, and the modern movement in America after the war was negligible until certain studies in the interesting field of the skyscraper began to appear, partly, as we shall see, as the result of the zoning law of New York, partly because of the evident advantage of simpler forms, and partly from designs reflected from foreign genius.

I suggested earlier, with reference to the restive spirits of design in our country, that we had not taken their spasmodic teachings and works very seriously, partly because as a people we took no architectural forms very seriously. Due to a spirit of eclecticism which prevailed among us, we have long chosen to adapt to our use works of the various nations and historic departments of those nations of Europe, as our own, without any feeling of guilt or unfitness. We have chosen from all history what we liked or wanted because it was historic, or appeared beautiful in its historic setting, and so we continued in the architecturally extravagant period which followed 1920.

From Florida and California, and through all inland cities, there spread contagious importations from the older cities of Europe influencing homes and shops and lesser public buildings after the manner of Venice, Spain, the Riviera, and Normandy, and the romantic farmhouses of Italy, France, and England. With them came antique and "modern antique" furniture, and industries relating to building found it to their advantage to reproduce tile floorings, roofing materials, imitation stone ornaments, linoleum rugs, and furniture imitative of the historic foreign materials. With such fascinating frolic for the public we could certainly see no prospect of the modest scientific attitude of French solutions in severely plain concrete or the equally severe solutions of the simple brickwork of Holland and Germany. In addition we still have and probably shall have for a long while to come, an initial economy in frame structure as adapted to domestic work. This prevails so generally with us that masonry or reinforced concrete structure seldom occurs in its European sense. Even the most severe reinforced concrete studies of the French type would be more costly for us than wooden structure, cement or brick-clad, consequently the manner of our domestic building is not directly required to change by reason of economy as was the case abroad. Any subsequent change which may appear in our domestic architecture will again come by choice and selection, and we should not at this time expect that such choice would be the severity which economy has occasioned abroad, nor that it would very shortly limit itself to a less abounding variety of form and color.

For our modernists the home will long remain an elusive problem. Such modern designs as have appeared bear the imprint of the modern French, seemingly sterile of beauty, yet retain the prevailing plan solution of the past two decades. Essential modernism, finding new and satisfying solutions in arrangement for comfort, economy, and studied minimum of both care and furniture, has not appeared in adequate architectural quality with beauty and charm which would develop a desirable popularity.

This will be a fascinating field for the genius of our advancing students of modernism.

Why should there be so marked an absence of unified criticism concerning this habit of choice that has instilled itself into the American domestic architecture? Are we to believe that, lacking sufficient mastery of the artistic possibilities within a normal development of form in so modest a problem, we are to accept the confusion resulting from the vast range of historic transplanting of humble foreign dwellings as the evidence of genius?

One cannot help wondering whether, when an era of sane economy comes, as it surely must come, we shall not see that a silly extravagance has existed and assisted in the creating of the confusion of our domestic architecture.

For the generation preceding ours a much more limited range of historic types prevailed and while the average excellence of design was no greater, at least a reasonable uniformity prevailed and the types more closely coincided in fitness with the climate into which they were transplanted. Since 1890 and more distinctly since the World War, the range of fantasy has been unequalled. Possibly the movie and its paper houses have been an influence in this direction. Because of this frolic in the "styles," our residential streets, unless richly grown with large trees, are seldom attractive, and our more desirable suburbs present a confusing architectural medley making a pitiful picture of our ability.

It is interesting to compare our position in this

matter with that of the people of Europe. This comparison appeared to me with great clearness while living in St. Jean-de-Luz in the Basque section of southern France near the border of Spain, in that section where the Pyrenees terminate at the Atlantic shore. The city is both ancient and modern, with historic monuments and with many recent villas of both French and English inhabitants. The characteristic architecture of the Basque section is clumsy, heavily marked still with half-timber type of structure used in conjunction with either stone or stucco. It is rather of over-formed and barbaric type; vastly different from the characteristic mediæval or Renaissance architecture of France. St. Jean-de-Luz lies some twenty miles by automobile from the Spanish boundary. The inhabitants of its villas are mostly people of wealth, who spend only part of the year there and, while there, enter into the Pyrenees and into Spain frequently. A motor trip into Spain and into the Pyrenees on the Spanish side or along the Atlantic coast of Spain is a distance of thirty or forty miles. There on the Spanish side are to be found quite exquisite simple architectural forms well suited to the hillsides and to the fishing villages, an architecture of the most elemental and pleasant appearance. Yet with this beautiful historic and artistic suggestion constantly before them, there is not in St. Jean-de-Luz a single building in all of its modern work, or in any of its older work, that suggests the Spanish design. But the architects of distant America find great interest in this portion of Spain and bring back from travel exact details from the hill towns of the Spanish Pyrenees for rebuilding in California, Florida and west Texas. Economy in France would be in favor of the Spanish type as against the Basque, but some deeper, underlying principle seems to dominate their architectural sense, so different from the universal habit of choice which prevails in America. With them the imported note is at once foreign—with us the foreign note imported seems at home amid our confusion. It is clearly a sense of natural sensitiveness and good taste. In this matter of style, Dean Edgell, of Harvard College, in his book, *American Architecture of Today*, says: "Let no designer defend his work on the ground that it is historically correct. The proud owner who prides himself upon his Louis XV drawing room makes a fool, not only of himself, but of his architect; so long as he bases his satisfaction on the "stylistic" correctness of his room. The merit of modern architecture can never depend on its correctness with relation to the art of the past." The French critic, Le Corbusier, more vividly tells us "The 'styles' are a lie. Style is a unity of principle animating all the work of an epoch, the result of a state of mind which has its own special character." Certainly for us in America no unity of principle animates our design in homes.

Among the students of architecture of today, rather than among the architects, one can feel a rapidly growing understanding of American appreciation in which previous habits of choice will not continue indefinitely. The architectural student is more universally seeking logic and reason, and finding greater inspiration in the cleaner forms, freer from historic tradition, which are emerging from the architecture of great structure in this country.

I find, for instance, the student presenting his case for sanity in this manner. Imagine the problem of three clients, one with a preference for Georgian, a second preferring the Norman farmhouse, and a third distinctly in favor of the Spanish—all of these persons having a reasonable desire for uniformity and owning adjacent lots. The student takes the position that, using the same materials, designing all three houses in a true modern manner, devoid of all incongruous historic forms which would accent their difference, it is entirely possible, providing the architect understands the spirit of the building of the three types chosen by the three clients, to obtain in entirely modern design the character and fitness of each home to the true qualities which prevailed in each of those historic types; that these qualities are not truly dependent upon extravagant copying of historic carpentry or furniture but upon arrangement, light and shade, formal and informal grouping which repossess the meaning and spirit of each type. Under such solution true architecture comes into its own—is able to express rightly manners of living, and fitness takes precedence over confusion. Wider understanding of architecture and its meaning will be the natural outcome for the students of the new generation as a result of the modern movement.

Of modernism in domestic work at home, the leaders are very few. Frank Lloyd Wright has chosen to work in concrete forms, adapted to residential construction on a romantic scale. His houses in lower California are to be included clearly within the modern movement and are deserving of an important place. His Inness house at Los Angeles is developed from slabs of concrete, each impressed with a texture. The building is arranged in simplest cubic form, but sufficiently free to possess clear romance in design and impressive directness in the entire composition. He says of his work in 1928: "Gradually the law of gravitation has its way, even with the profession. Natural tendency in even so humble a thing as building material will gradually but eventually force the architect's hand and overcome professional resistance." In his Snowden house, also at Los Angeles, he has used the same material, but possibly with less desirable effect. It is a mass which appears less truthful in structural forms and less architectural in its effect. In his Larkin Building at Buffalo, New York, we have a modern solution equaling the logic of the modern abroad—an industrial building in an industrial neighborhood. Massive, simple, fortress-like on the exterior, it takes its light from an inner court excluding the dirt, noise and confusion of the street. Wright produces his design clearly, free from any historic style, with skillful analysis of the plan requirements of the building, and the whole is interpreted in simple material.

From the preponderance of architectural variety as it exists all through America in the buildings of a

domestic character, we may feel that the modern as a movement and as understood abroad has not made its advent here. Any universality of demand for simpler forms, scientific rather than picturesque arrangement, maximum comfort with less furniture, has not matured.

In the vast field of building that exists between domestic architecture and the typically American structure, the skyscraper, the same range of choice prevails as in domestic work. In the lesser of these buildings such as community stores, small churches, and buildings bordering on the domestic rather than the business zones, a wide selective range of style has increased since 1920 in the same proportion as it has among the residences. It is only when we come to the skyscraper that we can feel a newness, a modernism in American work, and feel an architectural truth being sought and showing evolution and development. We can well start, therefore, with the lofty building.

Denkmar Adler and Louis Sullivan designed the Chicago Auditorium, a purely masonry skyscraper. Some four years Sullivan developed the plans of this colossal undertaking. It appeared as a romanesque development from the art of Richardson with the enormous weight characteristic of masonry. Marvelous as evidence of the spirit of the growing city of Chicago, still it possessed the clumsiness of the overgrown.

It was immediately followed by Burnham and Root's Monadnock Building, an undertaking involving sixteen stories of masonry construction, and showing the determination of our designers for lofty structure even before structural steel had been developed.

Holabird and Roche, with the Tacoma Building in 1890, carried forward the spirit for lofty building with the first skyscraper designed in structural steel frame, and Sullivan again carried forward the expression of the new material in his Wainwright Building in St. Louis.

With the introduction of steel, curious elongated forms of frightful derivation from mediæval architecture appeared, to give a meaningless and curious romanticism. There also appeared buildings of frankly box-like nature, devoid of interest or architectural quality. The movement during the nineties and during the first decade of the present century held in the majority of cases to the "packing-box" form, relieving it with a curious implantation of Roman colonnades at the base, and Italian arcades at the top.

We might well compare two forms in two St. Louis buildings, which are examples of the diverging schools of thought.

The Wainwright Building, by Sullivan, is a very true contribution by that artist, with the sane analysis of steel columns and their continuity in vertical structure, together with the great binding together of the design in the terra cotta band at the top. In this design the forces which sought expression in structure are represented, and their improvement over the preceding forms is apparent. Compare with Sullivan's building the Boatmen's Bank Building of St. Louis, by Eames and Young, a building representing a spirit of classical tradition. This represents a type of building which, with further refinement and study, attained greater acceptance than any other, as the type characteristic of the American office building. It was treated in a classical manner at the base with an unlimited succession of stories presented as an unbroken plane on which was a gridiron of windows; finally to be terminated by another colonnade in a somewhat classical manner. This design, however, carries the broad binding frieze so tragically heavy above the stubby piers of the upper stories, as if making a compromise in the direction of Sullivan's design.

With ever increasing refinement of detail the box-like type of steel framed building continued a complacent course through the early years of the century before the coming of the Great War.

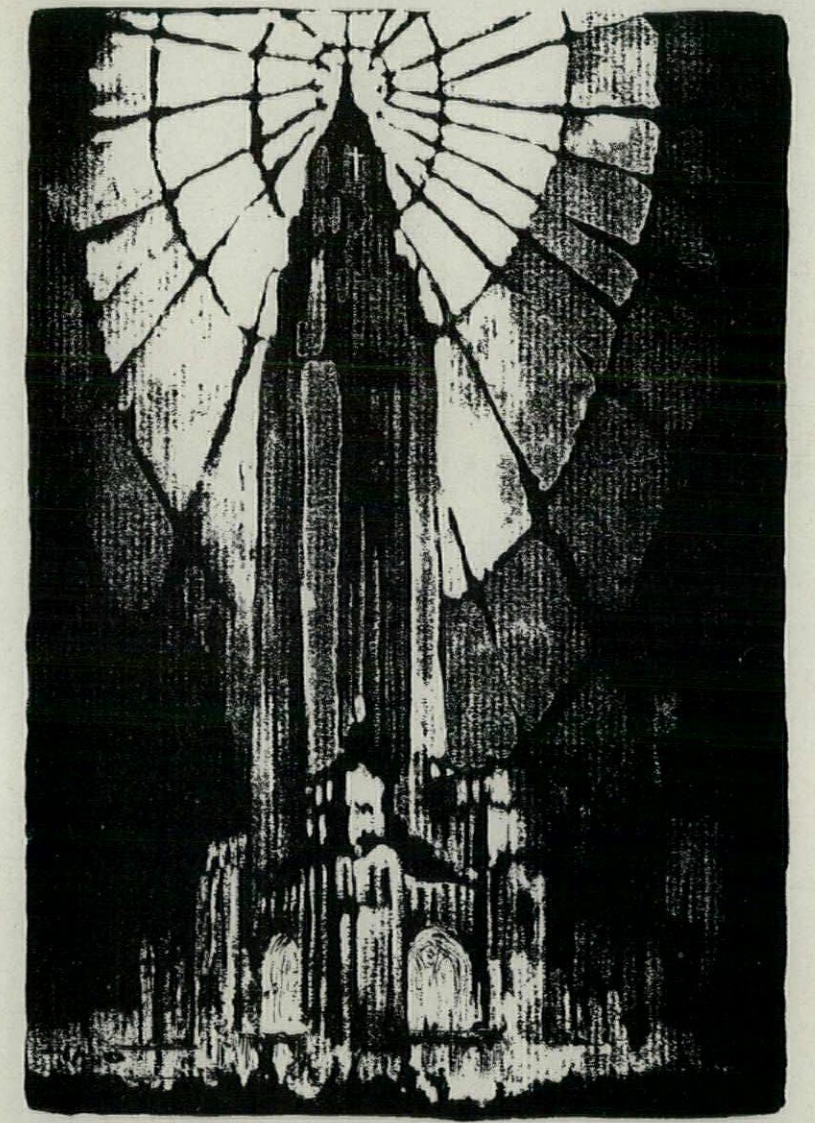
Here and there designs, lifting from the monotonous mass of the building a tower of merit, appeared, and the tower rather than the building became the object of interest.

During this period, Cass Gilbert, with his West Street Building for which a tower was originally planned, and with his Woolworth Building, achieved great beauty. In each of these designs the accent of the vertical steel is harmonious and pleasant; the architectural quality of excellent proportion is convincingly attained. While in detail a mediæval motif prevails, probably to entirely too marked a degree, the designs have symmetry and balance superior to those expressed in classical detail. The consistent dignity which we must feel to be a true attribute of towering buildings prevails, no flimsiness nor trash.

As the skyscrapers accumulated more and more in the congested area of Lower Manhattan Island, their frequency, close spacing, and divergence of form produced confusion rather than beauty, and only here and there along streets of a cavern-like nature were a few finer towers suggestive of the magnitude of structural effort involved in their building. The buildings were scarcely, as a whole, architectural. They were engineering beehives architecturally sheeted with confusing forms. Their divergent styles and distorted perspective caused an ugly rather than a beautiful city.

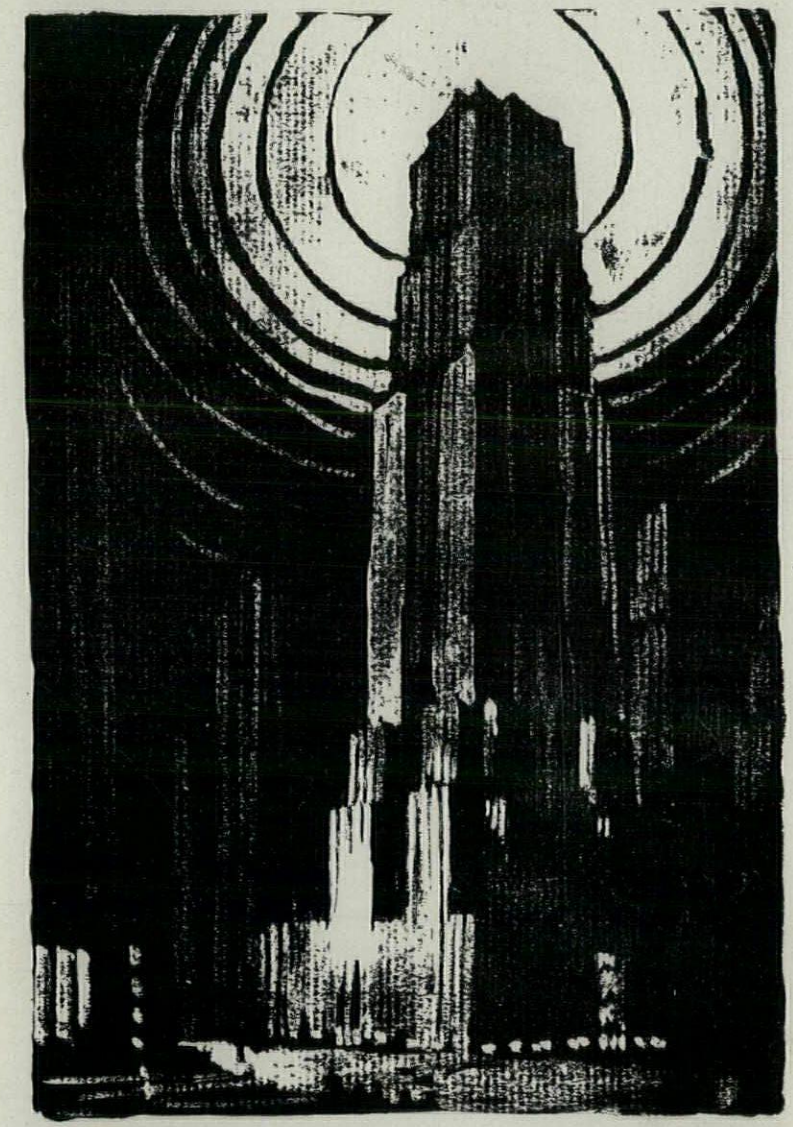
Two forces produced modernism for the skyscraper. The most architectural of these forces was the independence of genius in the type such as Goodhue suggested in the lofty design of the Nebraska State Capitol, giving lofty structure its meaning in American civilization, as the typical form which has found favor among us, and giving to lofty structure at the same time the advantage which it justly deserves of complete and unembarrassed perspective, a quality which it had not enjoyed in Lower Manhattan. Once the beauty of lofty structure pictured itself on the architect's imagination as separated from congestion and confusion, the lofty building became the characteristic monument of our time.

The second influence directing great volume of architectural effort into an entirely new form of steel structure came with the enactment of the zoning law in the City of New York in 1916. Probably no legislative enactment ever had as sweeping a reaction



DESIGN FOR CONVOCATION BUILDING

BERTRAM GROSVENOR GOODHUE, ARCHITECT



TENDENCY OF LOFTY BUILDING

AS IT APPROACHES MORE FIXED STANDARDS

upon architectural design as did the enactment of the zoning law, and certainly no such similar enactment produced as amazingly desirable a change. The purpose of the enactment of the New York law was to check the unlimited creation of deep, dark caverns, lined with buildings of great height into which sunlight could not penetrate. It was meant to reduce an already maximum traffic condition. The habit prior to the enactment of the zoning, or set-back, law had been to erect buildings, using every available square inch of space which the lot permitted and to such height as increasing structural knowledge allowed. This resulted in buildings of small frontage, near to or adjoining each other, of varying designs and of varying heights, but all towering dizzily above the streets, and the streets were the streets of pigmies.

I think we can see that the development in America has been to bring the skyscraper to the attention of the American people as the distinctive architectural expression of our time, and realizing its opportunities for beauty, it no longer exists in the minds of the people as the accident of Lower Manhattan, where, as a colossus, it first came into being. It certainly is not an architectural solution, when spilling its thousands upon thousands of inhabitants upon streets laid out for three-story residential buildings and following either the lanes or the cow paths of an early city. The scale of the skyscraper is just coming into the consciousness of the American people, and the scale of the skyscraper is a scale of boulevards not less than two hundred feet in width, and of perspectives which permit the building to be identified in its entirety by the human eye at a level of five feet six inches above the sidewalk. Authors of the zoning law had in mind that the law would not alone prevent the continual vertical aspect of the city street, but would actually limit by reduction the amount of space in the buildings and so decrease rather than increase the traffic at the street level. The zoning law, as it prevails in New York and has been adopted in other cities, is based on a limitation of the vertical height of the building at the street line. This is usually about one and a half times the width of the street. From that level up, the building for a certain distance may follow an imaginary line after the manner of the side of a pyramid, and so create a setting back of the surface of the building in an architectural manner until it reaches a certain limit varying with the different laws and approximating a quarter of its area at the ground; at which point it may continue vertically as a tower to unlimited heights. The effect of this enactment was to bring about buildings having a geometric form quite different from the simple cube, characteristic of the buildings built prior to the set-back enactment.

The new buildings at once became of greater architectural interest. Geometric forms resulting were more pleasant to the eye. The handling of these geometric forms within the staid formalism of the classic tradition was less applicable; and buildings appeared in more plainness and at first in not entirely pleasing proportions. The tendency in the buildings taking their form under the new law was toward tower buildings emerging from great geometric bases, quite rich in geometric forms near the ground. Such design had been suggested in the building proposed for the Episcopal Convocation by Bertram G. Goodhue. While his design, rising from the greater geometric mass as a base, was not one designed under the set-back law and did not carry that base to the limits permitted under such law, it was one of the great imaginative contributions to the dignity of lofty structure as it will be understood in America. The continuity of steel structure in slender ribbed-like treatment between the great corner masses was a poetic story of structural truthfulness controlled with true artistry, and the relation between such ribbed-like surface and the massive corner solids has been repeatedly used in recent buildings, though probably never as successfully as was indicated in Goodhue's dream-like design.

In comparison with Goodhue's conception of the steel structure between impinging stony masses, the Bush Tower of New York City gives us the steel design continuous over the surface in a manner that is stringy and of less convincing dignity.

The momentum of the set-back law created buildings rapidly assuming a telescopic character, that is to say, the excessive recession at the points of set-back gave the upper portion of the building an appearance of possible elongation or diminution within the lower drum. The perspective at the point of recession in these buildings became unpleasant, and it clearly violated the æsthetics to which we were accustomed, a reasonable continuity, as far as the eye is concerned, of the vertical support. It was perfectly logical as a steel structure that the inner columns could bear weight equal to or greater than that borne by the outer columns, and that their continuity within the lower structure was real, if not to the eye, at least to the reason, but the result was not completely successful in architecture.

We can compare this principle of the telescopic character of the buildings occurring under the set-back law with those which were not influenced by a similar law, as shown by the Tribune Building of Chicago, by Raymond Hood and John Mead Howells. This building was the result of an international competition to build the most beautiful skyscraper in America, and was executed in accordance with the winning design. The popularity of the second design, that of Eliel Saarinen of Finland, was very great among the architects, and in substance it followed the ribbed-like structure of Goodhue's Convocation Building, flanked by simple masses on either side, but gracefully receding in like geometric form, in almost musical rhythm in the upper stages of the design. The Tribune Building suggests an excess of Gothic form near the top, to a degree which seems to take away from the exquisite nature of the great shaft of the tower.

The movement of the tower building, where not controlled under the set-back law, is more interesting in the design of John Mead Howells for the Pan-Hellenic House in New York. More modernism, as

we tend to think of modernism, expressive of structure unadorned, of vertical continuity, exists in this design, and better still, the recession of the building near the top remains within a reasonable perspective devoid of telescopic feeling. The forms at the street level, while not intensely bare, are without great relief and have considerable likeness to equally modern foreign buildings. The forms near the top suggest in a terrifically powerful manner the vertical ascent which is characteristic of the entire structure. The windows seem to have lost rectangular dimension and to be continuous within the shadows of the great verticals which make up the building.

As compared with the beauty which prevails in the tower building free from the set-back requirements under its earlier solutions, one would feel that the set-back requirement had led to new invention, but not to greater beauty. The New York Telephone Building creates the sense of enormousness which modern structure attempts, but of an equal clumsiness and lack of pleasant relation in the geometric masses which compose it.

This naturally brings us back to the inherent conservatism and desire for purity of form which prevailed among our architects prior to the war and which represented our more outstanding architectural quality in greater buildings. Therefore, with relief, we turn to a building as distinct as that of the Savoy-Plaza Hotel of New York. We find here produced a building retaining the classical tradition designed primarily without emphasis of its structural form but with the artistic emphasis of beauty, a design in which a final romanticism is given in the towering roof resembling the chateaux of France even to the enormous chimney tops which terminate it. Throughout there is a refinement of proportion, a satisfactory expression of the vertical, and yet essentially a design in which the horizontal requirement of classicism is recognized and upheld. So we see the battle of the styles still waging and emphasizing, as always, the structural analysts of the modern, as compared with the advocates of form and beauty.

We may carry this battle with the adherents of romanticism even further, as expressed in Klauder's Cathedral of Learning for the University of Pittsburgh, in modified Gothic tower building, not restrained within the geometric exactness of either of the other two types, and seeking the adaptation of an historic motive derived from the architecture of the Middle Ages, exaggerated to a colossal height.

If there be a distinct tendency prevailing in the modern buildings of the new type in America, we can feel that that tendency is probably more unified at the present moment about designs which retain neither classical tradition in new adaptation nor the romantic mediæval tradition in the new type, but rather are bent on building up with freedom and with finer proportion, a recessive series of geometric forms of the utmost simplicity, ribbed in their steel-like nature from bottom to top, forming a simple vertical base for a great tower, the design of which retains its ribbed-like steel nature, rising, without monotony, between well-proportioned masses at the corners; its final termination, whether abrupt or sustained by spire-like roofs, relieved of telescopic quality, and its persistent lift, from ground upward toward the clouds, uninterrupted.

There has been more recently a limited adaptation of the cantilever construction to the skyscraper, because of certain useful practical advantages which this system has produced in foreign examples. The possibility of using the cantilever as a refinement toward the control of the recession in the upper levels of lofty buildings, in my opinion has been neglected. Where now these recessions between base and tower, and in high geometric masses abutting the tower, are frequently without refinement and appear abrupt, the cantilever suggests more gradual recession, more beautifully arranged perspective, and more exquisite silhouette reflecting the sensitiveness to be expected in excellent design.

May we not with reason question whether the skyscraper has not become really a problem the requirements of which are essentially fixed? Is there not after all an essential architectural unity in the frequent building of lofty structures composed of thousands of small cubicles, with the vertical circulation by elevators approaching standardization? Could we not expect more beautiful architecture if we accepted the modernists' view of perfection as requiring that "first we aim to set up standards" and then approach perfection by subjecting our competitive genius to the test of more and more refinement and beauty? Instead of so many small house competitions why not some in which the problem of a normal office building is definitely set up and competitive effort to produce beauty sought.

I question whether the most recent development of the skyscraper as a "stunt" of design is not much farther away from modernism than the gradual evolution of its design through the past twenty years.

I feel as I view the works done most recently in the name of the modern manner in New York City that the day of the modern may indeed be long delayed; that the rich meaning of the new thought is being lost amid the ill-shapen and grotesque. A popularity sufficient to allow experimentation with the new has prevailed before the sound spirit of the new manner has been sufficiently understood by the profession to permit a dignified series of buildings possessing the quality of architecture to arise. In place of such a series there have arisen colossals demanding attention from height and from bizarre material and ornament. For the moment at least, a sane judgment must give priority of architectural merit to the works of the classicists which preceded these modern monstrosities.

If these new works be modernism, then modernism would seem to fit solely that character of absurd technological exaggeration which has expressed itself in useless and thoughtless overproduction throughout industrial lines. Quality, for which a popular advertisement assures us there is no substitute, has been clearly neglected. Architecture, as architecture, has

been abandoned either from ignorance or from purely wilful effort to attract attention, in contrast to what one finds to be the development in northern Europe —a daily progress toward a real architectural quality, clearer and cleaner—a measured development meeting classical restfulness with true taste, yet at the same time retaining romance, that gentle hand of the artist, rather than a sense of form or mechanical expression alone. America, perhaps, is too quickly bearing giants whose coarseness may sweep us back to a violent classicism ere the new manner can become truly known.

If this be true, another twenty years may pass before an acceptance of the new manner, as being truly of the architecture of the future, can come for us.

I feel that the students of today most overwhelmingly condemn and discard the bizarre, cheap, tinny structures which are being labelled modern. The students are seeking a cleanness of form, a refinement possessing consistent scale, and an architectural organism which expresses itself in an architectural manner. These men in their day will give us buildings in terms of an all-pervading beauty which we all eagerly await.

Modernism has appeared among our public buildings within reasonably conservative bounds. It has appeared as a more free interpretation of the geometry of building rather than an importation or development of a "style." Here and there in lesser buildings, some of relative importance, some of commonplace position, the new composition is apparent. The Library by Goodhue, at Los Angeles, in massive monolith, presents with vigorous shadows a building bold in proportion, but a contribution to the new vitality in design. Los Angeles has made to this modern work a great contribution of monolithic structure, both in concrete building and in steel building reflecting a concrete character. Churches by Allison and commercial buildings by Nimmons carry this quality. To a degree the concrete monolith has, in America, continued to associate itself with historic forms. Definite style-forms, simplified but retained as suitable to casting in concrete, have been used, and the freedom and impressiveness of a barer structure have not been realized to the same degree as they have been realized abroad.

Cass Gilbert, during the war, produced one of the most outstanding concrete designs in our history, in the Army Warehouse at Brooklyn. The design was so vigorous, so free of ornament, so distinctly excellent, that it deserved importance beyond the practical purposes of the building to which such architectural beauty was given. In recent works which have carried on the suggestions made in Gilbert's warehouse there have been an added richness of form, a useless accumulation of surface ornaments which have made similar buildings of more recent years throughout the country unpleasant in appearance and certainly unworthy of comparison with the splendid feeling of Gilbert's design.

In America, quite as in Europe, architectural publications have expanded vastly, and knowledge of each new building rapidly becomes the possession of the architects. There is much influence created by the dissemination of these forms, but as yet the new manner is so little understood that only occasionally is an excellent design the basis of further study for beauty of contour and exquisiteness of proportion. The successive designs more often reappear in declining stages, less vigorous than the original.

The very recent competition for the Chicago War Memorial cast a favorable light upon the position of our architects toward the new manner. The choice was clearly one of excellent architecture. Without obligating us to the modern, a design of exquisite power, vigor, cleanliness, and freshness was chosen; one in which the traditional preference for the convincingly monumental merged with a modern divergence from the purely historic forms. The design, which was by Eric Gugler and Roger Bailey, who are of our modernists, possessed true architectural beauty. The nature of our modernism, when it comes, is evidently to be moderated by our conservative tradition.

Our examination, therefore, into the advent of modernism in America leads us to realize that it still lacks assurance and is a "style" from abroad. Here and there a shop front may reflect the futuristic character of France of 1924-25; here and there some fantastic composition of marble and aluminum may thrust its newness and conspicuousness in our faces. The nature of our domestic architecture is not approaching any serious modification from its eclectic trend.

This brings me to a picture of the future, as I see it, for American cities. Architecturally it is to be one of tower cities. The accident of Lower Manhattan which produced tall buildings in immediate proximity to each other developed a structural ingenuity adequate to the building of lofty skyscrapers. The beauty and inventive newness of solution resulting from isolation of the skyscraper silhouettes of dream-like quality are imprinting themselves on the mind of America.

Before the war Auguste Perret, distinguished French critic and modernist, looking with the perspective of a foreigner at the skyscrapers of America, said that the future city would be a city of towers and interpreted his meaning in the terms of the Paris he knew. For him the skyscraper meant this: that in a city like Paris, with its prevailing uniform building conditions limiting the height of buildings to seven stories at most, two of which were in the roof, a skyscraper of one block area and thirty to thirty-five stories high would permit the housing of all the people that at present were housed in an area of five blocks; that by housing in towers they would have clearer air and sunlight, with less noise and dirt, and greater economy; and that by converting the present city into such a city of towers there would be liberated four city blocks to each tower. These would in turn give great boulevards and fine parks. In other words, the city of towers would be a city of light, air, parks and recreation, exactly the reverse of the condition which Lower Manhattan had projected upon the world. Perret's vision was creative, architectural.

Le Corbusier has developed the picture created in Perret's fascinating phrase, "The City of Towers,"

and while lesser buildings are indicated as occupying part of the park spaces which Perret had considered essential to the plan of the city of the future, the tall buildings exist for Le Corbusier as free standing silhouettes, far enough apart to be clearly identified and on boulevards of three hundred feet in width.

Finally, Ferriss, in his *Metropolis of Tomorrow*, pictures likewise a city of towers. For him the future city plan will consist of boulevards placed half a mile apart in each direction. Between the grand boulevards will be streets of lesser width. There will be no skyscrapers except at the intersection of the grand boulevards, and there the skyscrapers, of base equivalent to two or four blocks, shall span the boulevards with great arches. All the intermediate territory on the grand boulevards and on the lesser streets shall have a uniform height of six stories, except as they approach within a block of the towers where they shall rise to slightly greater height, approximately nine stories, and the tower buildings shall be real tower buildings with heights which are limited according to engineers by the strength of elevator cable, and by financiers on the basis of economy of structure, and by hygienists on the comfort of the human ear drum. The position of the tower as rising over the intersection of two great boulevards where it may be seen in its silhouette, in a vast perspective, is the vision of Ferriss' plan. Probably in no case shall a city, within any reasonable time, meet the ideals of any of these great plans, yet the tendency has developed sufficiently well among the American people to appreciate the beauty of the skyscraper. That beauty still suffers to a vast extent by its close proximity to other similar buildings.

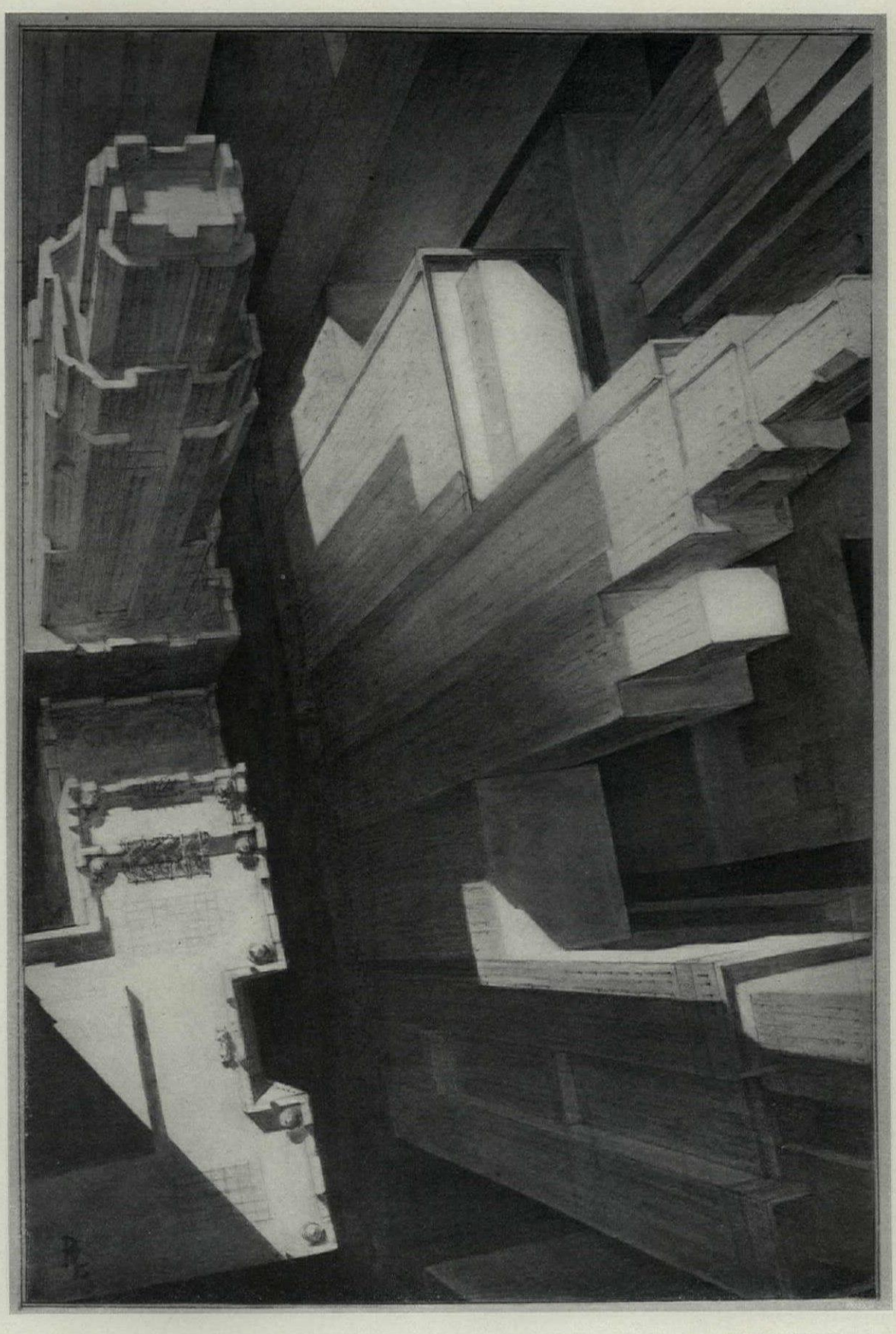
The identity of a tower building as a tower, visible from all four sides, is becoming pictured on the American mind and we may expect that the skyscraper, being typical of the greatest beauty of American architecture, will very naturally choose locations apart from congestion, where such permanent aspect of beauty may be maintained; that the skyscraper will become characteristic of American building, having a community or civic aspect, in masses not identified with the greed of commerce, business, or industry; and that these towers shall become civic centers of art, science, medicine and drama, and so forth. Thus there will gradually evolve, in accordance with natural tendency, a dispersion rather than concentration in American cities, and our cities will come into their maximum beauty.

Still in this optimistic vision is a word of regret. Our imagination rises to the romance of lofty buildings, yet we still see too little of the streets. Nowhere has modernism awakened for us the exhaustive architectural study, as it has at Helsingfors, of all aspects of the future city. Individual initiative may still wreck the work of masters, and individual wilfulness may continue to mar our skies with the grotesque, cast in forms to live for another century. Congestion and coldness of material mark the streets from which our buildings rise, and almost a revolution will be necessary for the restoration of space adequate for the beauty of tree-lined boulevards. The modernists, when their theories are generally understood and are practised with the guiding love of beauty, can prove for us the beauty and practicability of uniformity rather than confusion, but much that has been done poorly must give way before them.

We live in an age of accelerated development. No longer are centuries necessary to evolve types and perfect them. The skyscraper with its steel and concrete and elevators has only some forty years of history, still it overshadows all our architectural problems. That its development to exquisite beauty is assured, the accelerated progress of the past twenty years declares in undeniable terms. One can not look with doubt upon the future of American Architecture—even though there be moments of despair.

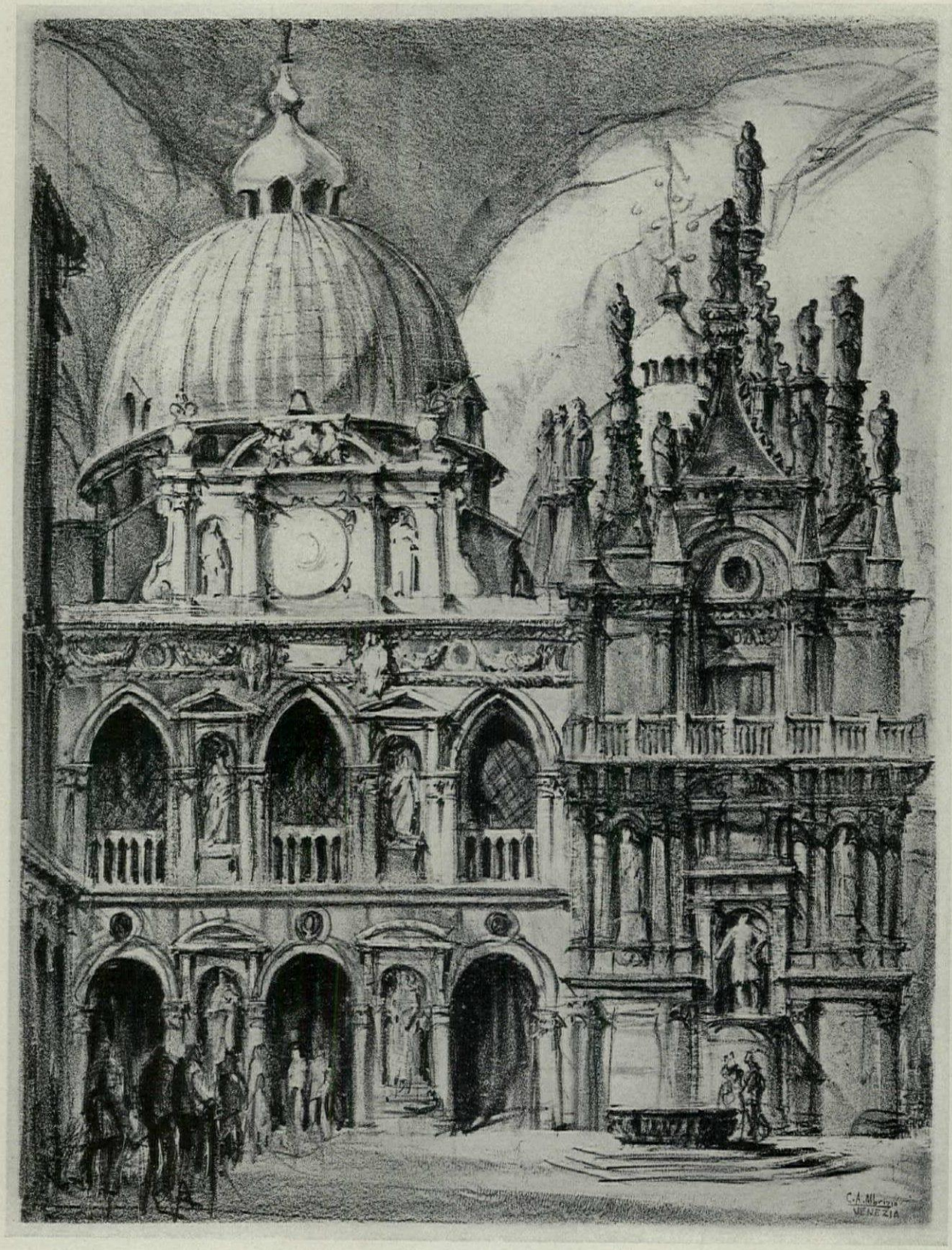
Finally, our conclusions as to the advent of modernism in America: from the conservatism which still seems to be in control in America, from the degree to which purely speculative solution is avoided, and from the marked acceptance with which meritorious design is received and advanced, we may safely welcome the modernist. More and more power, we may well wish, to those whose skill brings fresh solutions to our ever-widening problems and opportunities, that they may interpret the living spirit of architecture. Whether our future be of gigantic forces of commerce and industry, corporate machines beyond the sensibilities of the individual, and whether such shall ever deny the individual's longing for beauty, we cannot say, but it is my impression that so long as the glory of Roman structure remains known to our architects, and so long as the monuments of the Middle Ages afford an emotional background for the romantic imagination, beauty in architecture will be repossessed in each successive century in new manner and with refreshed power.

The architect shall no longer work in the spirit of history but in the knowledge of its substance and by the zeal of creative research shall a new beauty come, crystalline, clean and with power to lift high the imagination.



FROM A PENCIL AND CRAYON DRAWING BY LEOPOLD DE POSTELS OF THE DE POSTELS STUDIO

AN IMAGINATIVE CONCEPTION OF A MODERN AMERICAN CITY AS LOOKED AT FROM ABOVE



FROM A LITHOGRAPH BY C. A. ALBRIZIO—"VENICE"
Size of original, 17½" x 23"

Why is a Pentagon?

By Ernest Irving Freese

In Part 12, of my geometry series, published in the September, 1930, issue of PENCIL POINTS, I "starred" an old friend of mine by the name of Pythagoras—a fellow that Joe Brahdy calls "pretty much on the square." He's also pretty much on the pentagon—Pythagoras, not Brahdy. Anyhow, it's no wonder that the 863,409,013 college geometries published since Euclid messed up the pentagon of Pythagoras, by giving priority to its progeny the decagon, 20-gon, 40-gon, etc., 'til they're all-gon, have apparently failed to get across the fact that the 2400-year-old Pythagorean construction of the pentagon can be easily proved to be mathematically exact merely by utilizing the properties of similar triangles coupled with the property of right-angled triangles by means of which Pythagoras, being pretty much on the square, proved that the rope-stretching construction-foreman of the Sphinx was also pretty much that way too. I admit this is of no consequence—to Pythagoras. But I promised Joe I'd clear up this "don't know" about the pentagon. So here goes.

The questioned construction is here reproduced at Diagram 1. I am to prove that it is mathematically exact. By the geometry of the case, the constructed side, S, of the pentagon, for a radius equalling unity, or 1, is seen to become $\sqrt{\frac{5-\sqrt{5}}{2}}$. But, *is this the exact length of a 72-degree chord?* We shall see.

At Diagram 2: let D = the diameter of a circle; and S = a chord subtending a central angle of 72 degrees.

Then: S must be one side of an inscribed regular pentagon, because, by hypothesis, it subtends an arc equal to 1/5th of a circumference; and $f = 36$ degrees, because an inscribed angle is always ½ the central angle subtended by the same chord; and $g = 90$ degrees, because it is the inscribed angle of a semicircle; and $h = 54$ degrees, because the sum of the interior angles of a plane triangle is 180 degrees.

Now let $j = f = 36$ degrees.

Then: $K = L$, and $m = (h-j) = 18$ degrees, and $n = 180$ degrees minus $(g+m) = 72$ degrees.

Next let $Q = K$, and $P = T$.

Then: $Q = L$, and $(P+T) = 2P$, and $u = m = 18$ degrees, and $(u+m) = 36$ degrees $= f$, and $v = n = 72$ degrees $= (u+h)$.

The above analysis thus discloses the fact that the two triangles whose sides are, respectively, the lines D, Q, $(P+T+L)$ and the lines Q, $(P+T)$, K, are *similar and isosceles*. Hence, by the law of linear proportionality of similar triangles:—

$$D : Q :: Q : (P+T)$$

But, from the foregoing deductions, $(P+T) = 2P$, and $Q = L = (D-2P)$.

So, by substitution of the equated values:—

$$D : (D-2P) :: (D-2P) : 2P$$

Now, let the radius equal unity, or 1. This makes $D = 2$. Whence, by further substitution and simplification:—

$$1 : (1-P) :: (1-P) : P$$

From the above expression, $P = (1-P)^2 = \frac{3-\sqrt{5}}{2}$

Finally, in the right-angled triangle whose rectangular sides are P and S, and whose hypotenuse is Q:—

$$S^2 = Q^2 - P^2$$

But, since $D = 2$, Q becomes $2(1-P)$, and, therefore, $Q^2 = 4(1-P)^2$.

So, by substitution and reduction:—

$$S^2 = 4(1-P)^2 - P^2 = 4\left(\frac{3-\sqrt{5}}{2}\right) - \left(\frac{3-\sqrt{5}}{2}\right)^2 = \frac{5-\sqrt{5}}{2}$$

Therefore, $S = \sqrt{\frac{5-\sqrt{5}}{2}}$ = the exact length of a 72-degree chord or one side of a regular pentagon inscribed in a circle whose radius is 1. This is the same value arrived at by the questioned geometrical construction of Diagram 1. Ergo: the Pythagorean construction has been proved to be mathematically exact. *Good night!*

But wait a minute! Here's *another* way to construct a pentagon. It's even simpler than the Pythagorean construction. I think Gauss had a say-so about this one. Anyhow, it can be proved by the identical means I have used above. Diagram 3 shows you this one. Now *you* do it. And you'll discover that it's based on the same old saw that I have not even mentioned by name until now: the geometric saw that *divides a line in median section*, that is, in the "divine" ratio of the ancients.

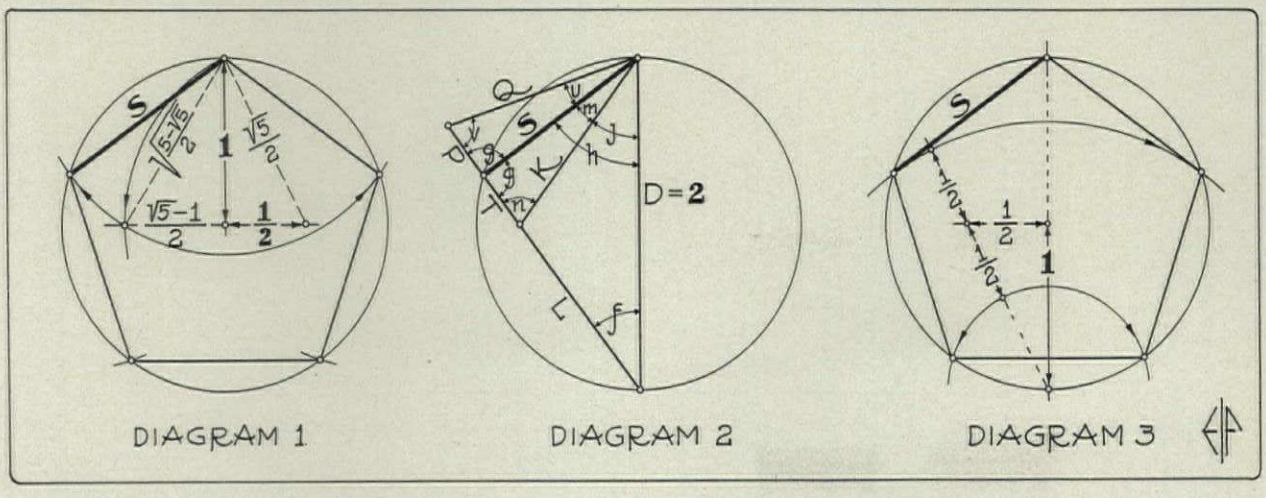
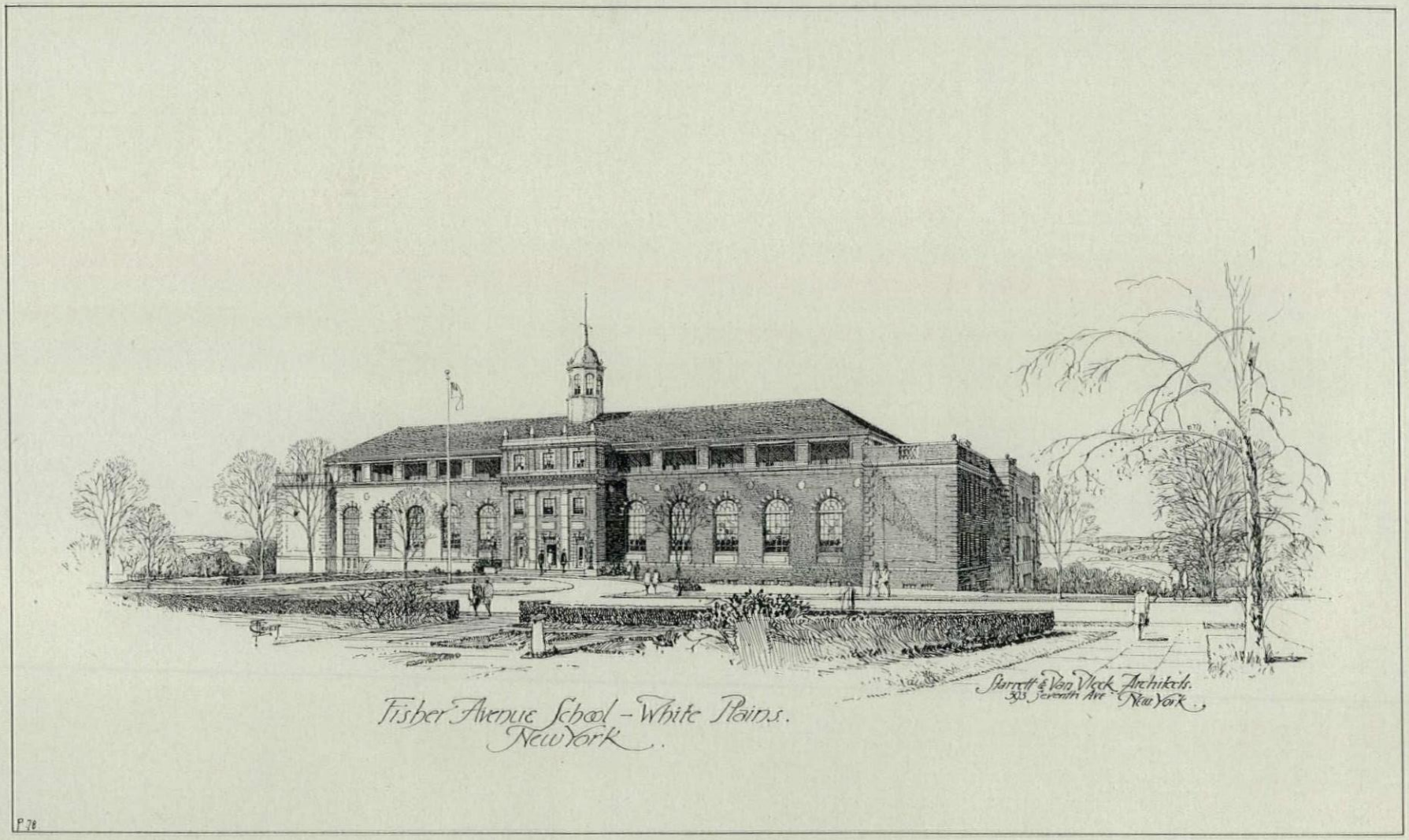


DIAGRAM 1 DIAGRAM 2 DIAGRAM 3



FROM A PEN-AND-INK RENDERING BY FRANCIS H. CRUESS

FISHER AVENUE SCHOOL, WHITE PLAINS, NEW YORK—STARRETT AND VAN VLECK, ARCHITECTS

How an Architectural Project is Carried On

From the First Contact up to and Including Working Drawings

By Louis E. Jallade

Editor's Note:—*This is one of a series of talks given before the Junior League of the New York Society of Architects once a month at the Murray Hill Hotel. They are given under the direction of Mr. Louis E. Jallade. Admission is free to draftsmen and architectural students. Subsequent talks will be on: "Supervision of the work in the field," "Technique of writing specifications," "Office administration and cost of producing drawings," "Selling and promoting of architectural services," "Selection of building materials," and "Legal questions pertaining to the architectural profession."*

So that I may not lose direction in this talk I will say that, as far as the architect is concerned, every project divides itself into five parts.

First—Obtaining the commission. That means either selling or taking an order. (We have set aside a later session for a special talk on Selling.)

Second—Solving the Problem, which means making of studies, etc.

Third—Making the Executive Documents, including plans, specifications, bids, contractors, etc.

Fourth—Checking the actual building with the Executive Documents. (This means Superintendence.)

Fifth—The termination of the engagement. (This means final inspections, checking of bills, guarantees, and the final certificate.)

Using these five classes as a guide, we will take up the second part. (The first one—Salesmanship—is to be taken up in a special talk.)

We have the Owner's requirements—that is, what he thinks he wants in this building. It is now necessary for us to determine whether he really needs what he thinks he does, and if so in the form he thinks. This statement, whenever I have made it, has immediately started a discussion. Many architects believe the Program is the inspired word. We will forget the controversy for a moment, and follow along my line of thought. If you are successful enough to have an owner come to you and then have him tell you that he has bought or is about to buy a lot 20 x 30 feet at the intersection of the two most important thoroughfares in your town, and then he tells you that he wants to build an apartment house on this lot, common sense tells you right off the bat that he has started off on the wrong foot. Your sense of design tells you it is wrong for a client to ask for a California type of house in a Northern climate. I am not worried about such obvious contradictions.

I might illustrate this. A Building Committee in New England wanted a Community building with large social facilities and about fifty sleeping rooms, a large gymnasium, and a good-sized swimming pool. The building was for men and boys only. Now this building could be operated successfully only if it had an ample income from its bedrooms and games. It was very necessary that a careful analysis be made. A three-day study of the town demonstrated that there were ten women for every man employed; that the young men left the town whenever able to; that there was no place of amusement of any kind in the town except a theatre which functioned once a week.

LOUIS E. JALLADE

This survey demonstrated what was really needed was a women's building and not a men's building. We finally persuaded them to do this very thing and the building has been filled to capacity and pays well. The owner wanted something but his premise was wrong, and as the architect it was my duty to steer him right.

Of course, this is very controversial. There are some of you who will not get this point of view, ever. I know. I have had men who have been in my organization only a short time, who, when given a new job, would say, "give me the owner's requirements." It is the old school stuff. They ask for a program instead of asking what the actual conditions are.

To develop actual conditions means a definite brain effort. That may be why some people do not take to that very kindly. However, to develop actual conditions it is necessary to do as the physician does in examining a patient

for the first time. The patient has aches and pains. By some physicians these are relieved by dope or soft soap—by others, an X-ray of the teeth is taken which shows that the condition is brought on by an abscess of which the patient knew nothing. The advance in science and medicine is on the side of the man who X-rays rather than that of the one who purges and bleeds. You must X-ray the conditions before you can agree or disagree with the Owner as to what he thinks are his requirements.

As I am speaking, the question comes to your mind, "How can I afford to say to an owner that he is wrong?" In architecture the rent is barely paid by the "potboiler," but income and leisure are produced through repeat orders. Repeat orders do not come from clients who do not get the goods delivered properly.

If you and the Owner are guessing as to what the building should be—both guessing, differently, but nevertheless guessing—then your chances of hitting it right are one in a hundred thousand. However, a survey on your part to show whether a hospital, apartment house, or club should be of such and such a size will determine what is right. If the survey is carried on by you it will certainly attach a great deal more weight to your statement.

Do you think for one moment that the management of Childs' restaurants or of the Woolworth stores select their new locations by looking for "store to let" signs. They do not. They select towns and the locations in the towns by actual count of potential purchasers that pass a given point every day.

In making a survey we must find the "inside." It is something like a scientific analysis. What does the town need to bring about a certain result? What are the numbers and quality of the people who have this need? What might be the possible future growth of the town and adjoining communities under given conditions? Let us take the case of Camden, New Jersey. Did Camden need a bridge to Philadelphia or did it not? A survey would have shown that the people of that city and the outlying districts did their minor shopping in Camden because it was difficult to get to Philadelphia. It meant changing trolley cars, taking a ferry, and then a Philadelphia subway to the shopping district. Would a Philadelphia-Camden bridge improve the retail business of Camden? Here is what happened. Since the bridge has been finished, automobile busses operated from the outlying districts now rush through Camden and over the Bridge for the same fare that it would have cost to get to the center of Camden, and the entire retail business which once stayed in Camden is now dispersed through Philadelphia. The news that there was to be a bridge was a signal for a real estate boom in Camden and a consequent building of hotels, office buildings, theatres, etc., all of which were based on a false hypothesis and all of which are now left high and dry. This is given for the purpose of showing what a survey means.

There is also the survey of existing buildings similar to the one you may have in mind. An intensified study of this type of building is necessary. It is here that the specialist excels. He knows from past experience how certain things react in this particular problem. Complex modern problems of life and a not too keen architectural training on the part of some architects make necessary the specialist. The specialist, in turn, destroys himself, but while he is going strong he does know the intimate requirements of that particular type of building. In order to accomplish approximately the same results as the specialist it would be necessary for the architect to be scientific-minded, so he may know how to carry on a research in the particular field he happens to be touching.

Let me use as an illustration a building built some twenty years ago, an immense building. The architect had never designed one like that before and he placed the elevators without having made a thorough survey of what had been done elsewhere. The Owners became suspicious and brought in an experienced architect who, at a tremendous (but worth while) expense, changed the entire elevator layout—and the first architect lost his job.

There is much resistance against this research work. Unfortunately, many of our young men are not trained in this line of research. Then there is always the man who feels that this or that cannot be done because it has never been done before. This type of man is so immune to novelty that only death could pull him away. He usually says he can design a special building without any help; that all building problems are similar. He is the kind that starts a problem by designing the façade first and the plan last. If he attempted to dissect the problem he would probably not understand what it was all about anyway.

There is another important phase concerning actual conditions, and that is financial considerations. You may have a choice between several sites. It may be necessary to make sketches for these various sites, operating budgets and estimates of cost for each, so that one may be weighed against the other. If you come to your Owner and show him that his point of view, or his so-called "owner's requirements," are wrong, these indisputable facts presented to him in an impersonal way leave no room for ill feeling on his part.

The architect is not hired primarily to make a building beautiful. If he were, he would be a luxury and would have lost the important position that he now holds. An architect is employed to correlate and tie up the beautiful and the practical. He is the man of all men on that job who must know all things pertaining to the building. He must know building materials, how they are brought together; he must bring them together in good taste, giving the building a pleasant appearance; safeguard his client against fraud or negligence; see that bids do not exceed the appropriation, and, above all things, that his talents are not expended on a "white elephant." The wise architect will not tie himself up to a building preordained to failure.

It is better to forego a commission entirely and starve a while longer than to put up a building that is a financial failure. You may never live it down. It is better to tell a client that he should not build, even though you lose the job. Do not "kid him along" with the hope that you can get through with it.

This analysis of building conditions brings you to certain conclusions. You present these to the owner and you are then ready to jump to the next step, the "Making of Sketches." There is one point that I must bring out—our architects must learn to "use their brains more and their hands less." If you say to the average architect I am thinking of building so and so, he immediately begins to make a sketch with his pencil. The making of sketches should be the last thing to do. We, as architects, have belittled ourselves by being forever ready to turn to make as many sketches as the client might expresss a desire to see. A sketch is nothing more than the mechanical action necessary to put on paper what you have reasoned out in your mind.

A sketch is the easiest thing that an architect can make. It is the most difficult thing for the client to make, so that both attach to it unfair values. It is like a doctor's pre-

scription. It means nothing unless it follows a diagnosis. It is not the time that it takes to make sketches but the number of years that it has taken to prepare the mind in order to be able to make the sketch. Diagnose the subject aloud with your client. Do not make sketches. Sketches cost money, take your time and your draftsmen's time and form the one leakage in the office that is the most difficult to stop and is almost impossible to measure.

Do not show your client two sketches or more with the idea of showing him something from which he may choose. Show him several sketches when accompanied by operating or cost figures. Bear in mind that if your client is able to choose between several sets of "show sketches" then he is able to do a little more than you, because you have not yourself been able to choose. Arrive at your conclusion, be sure that your scheme is right, show him a sketch and sell him that. Tell your client the reason for showing him that one sketch; how you made numerous studies and sketches and your scientific way of arriving at a conclusion. Be sure you do this. Do not let him think you made one sketch and let it go at that. Set up your sketch like a proud mother shows off her newborn baby. Do not let a client rush you into getting out sketches like a machine turns out buttons. Do not hurry unnecessarily in getting out sketches. Everybody wants things right away. It is a habit. They even want things "yesterday." If you think you are impressing a client by leaving him at 5 o'clock and meeting him the next morning at 8 o'clock with a set of sketches that took you all night to make, you are mistaken. If you can turn out sketches so fast then thinks he they cannot be worth very much. You must tell your client that it will take just so much time to study and so many hours or days to make the sketches. If you beat that time by a few days it would be better for you to go out and play golf and present the sketches when you return.

The reverse of that is true if you say you will have sketches ready at a certain time. They must be ready on the minute.

Another thing, in presenting sketches to your client, do not slide over them as if they were nothing at all. They are actually the result of a lot of hard work. They represent many hours and weeks and years of study. If they were so easy to make the owner would make them himself. Do not "throw" sketches at your client. Do not rush him. He does not know as much about planning as you do and on this point he is mentally slow. You must explain to him in a slow constructive way what these sketches mean. It is very important that the owner should know just exactly what these sketches call for. Do not start working drawings until the owner is absolutely sold on the scheme. Play square with him. He does not know as much about the plans as you do. Do not try to inveigle him into a condition of mind where he is hurried and then tells you to go ahead. Ask him whether he understands how you go from this room to that room; whether he understands that a room is a certain size and the ceiling height is so and so.

When this is all done and you are ready to start working drawings, do something of this kind. Say to your client, "Now we are crystallizing this scheme; we are going to make working drawings, steel, mechanical equipment and what not. Sketches are cheap compared with working drawings. If you make any changes in the working drawings after they are started, I will have to charge you for making changes." Make changes in sketches rather than in working drawings. Many of the disputes between the owner and the architect are caused by ignorance on the part of the owner. He does not know the difference between a sketch and a working drawing. Architects have not sold that idea to the public. The average owner wants to play square with the architect but he does not know what square is. He does not know that he is doing the architect an injustice when he changes drawings and refuses to pay for them.

I have a habit of keeping a report of all meetings with the client. I will give you an example of part of one of these reports. This report saved me much embarrassment when this owner changed his mind after most of the drawings had been finished. At the time the sketches were finished we had a meeting with the owner. Minutes were made of this meeting and a copy was sent to the owner. In this meeting I said (and it was so recorded in the report of the meeting), "I want the approval of the scheme because the plans are being crystallized and it would cost the Committee money if the scheme were upset. In other words, we are now starting work on the final drawings, the sketch stage having passed." At a later date the Committee made a change. I called their attention to the report of this meeting and there was no question about it when I sent them my bill for making the change.

We are now about to start discussing working drawings. I have called this the making of the Executive Documents. Before these are started we must obtain certain definite information from the owner and public authorities. We must know the kind of electric current, the position of the sewer, the water gates, the lot lines and encroachments, and all of these things must be known before we start drawing. We then take our final sketches and send them to the mechanical and structural engineers for their preliminary studies, and our working drawings are started.

Now there comes a question which will probably never be answered—at what scale shall we make working drawings—eighth or quarter? I can only say that there are advantages in each, and the answer is dependent upon the type of the building. If it is a simple building, eighth will do, but then you will have to make more details, such as details for bathrooms, special rooms, etc., but that is unimportant for the purpose of our talk. But this is important—the question of what to show and what not to show on the drawings. You can put this down as a rule. THINGS SHOULD BE SHOWN OR CALLED FOR ONLY ONCE. We have three documents that go to the contractor—plans, details, and specifications. The specifications should not contain anything shown on the drawings and the drawings should not contain anything mentioned in the specifications.

In 1904 we, in our office, devised and began to use a Schedule of Materials. First we put this on the plans. Then in order to save time we put it on a special sheet. This Schedule of Materials saved a tremendous amount of specification writing and notes on the plans. (I wish we had copyrighted the system.) This Schedule of Materials was later improved by other architects by adding to it a schedule of doors and windows and the custom has now become universal. While plans should be easily read and dimensions taken off quickly without additions or multiplications, at the same time nothing should be duplicated on a drawing. In other words, show things once only. Then you check only once and rub out only once. The question of making drawings in pencil or ink, on paper or cloth, etc., is a matter of personal taste. But let me say that the thing that sinks the accounts of an architect into the red is the overlapping of unnecessary drawings.

Specifications we will not treat here. That is to be a special subject which I will not even attempt to outline.

On the mechanical and structural work, this is about as far as you go if you have outside help—you must tell the engineers what you are trying to do. You must tell them to avoid exposed pipes, etc. Then you must take their plans and check them over so there are no surprises in the building. You must know that if a pipe line is shown three feet away from outer walls, that the steam fitter will put it in that way, even though there is a general note on the plans that all horizontal lines must be kept within six inches of the outer wall.

We have now reached what, next to the making of the preliminary drawings, is probably the most important item, and that is the checking of the documents. They must be checked to see that they agree exactly with your sketches approved by the owner. Bear in mind that you are probably suffering from a condition which is found in many offices, and that is the desire to improve design. It is not always an improvement, but the draftsmen, and even the architects, have a desire to put personality into a building. On top of that are such things as unforeseen steel, added space needed for mechanical equipment, and, sometimes, building law requirements. I have seen plans come out of a drafting room that were so foreign to my sketches that even I could not recognize them. You must establish a rule in the drafting room that nothing can be changed from the sketches without the head of the department knowing about it. This is the first item of checking—to see that the working drawings agree with the sketches. Sketches approved by the owner are important legal documents.

Then the plans must be checked with the engineers' drawings to see that the proper chases are provided and to see that furring and what not are taken care of for conduits and other things.

Then we must check the engineers' drawings to see that we have no girders running through the rooms; that the pipes can pass by the beams. There will be checking of shop drawings later, after the contract is let, and they are not to be overlooked by any means.

Let me tell you frankly that one of the most important functions in an architect's office is checking. There are two ways of checking—one where the checker sits on a high stool and waits for the plans to be brought to him. Then he draws rings around the mistakes or things he does not understand. Then there is the more intelligent constructive type of checking, which means checking the drawings as they are being made. An intelligent specification writer and checker or squad boss or the boss himself will be continuously traveling through the drafting room and checking things before they are crystallized. It is expensive to check later. It is expensive to find mistakes after they have been drawn, where they must be rubbed out in plans, elevations, and sections. Checking should be considered as a preventative medicine. "Catch them young."

We now come to superintendence—superintendence of work in the field. We will take that as a separate subject because it is a subject that should be separated from anything else.. There are men who are primarily designers; others are superintendents. The superintendence is carried on outside of the office so let us treat it as outside of this talk and this topic will be taken up in a later lecture.

You will, of course, ask at the end of this talk what do we do with samples; how do we check them; how do we carry on our blueprint orders, etc., all of which would seem to be general office practice that has to do with the method of studying a project but only indirectly. We are going to have a talk later on about office practice and office administration so do not let us bring that in here.

Let us now take up the fifth item which is the "Termination of the Engagement." We will assume that the plans and specifications are complete and correct; that the superintendence has been efficient; that we have issued our certificates for payments from time to time, and we now come to the final certificate. You must bear in mind that the issuance of the final certificate means just what it says —"*the final certificate.*" You cannot get behind this unless you can prove fraud. There are no ifs and ands to a final certificate. Therefore, in a final certificate you are certifying that the building has been finished in accordance with the plans and specifications.

Now comes the question of extras and credits. Unless you have kept an accurate record by number and description of all credits and extras and unless they have been signed by the owner and builder and architect, you are in difficulties. You are now in a phase of bookkeeping. This phase of the work is particularly important, because you are now entering in a part of selling which we might call "after selling." In other words the building job is finished and we are getting into the hard luck stage. The switches may not switch, the hot water may not be hot, the roof may leak. The mystery and glamor of the whole new building adventure has gone by. Any unauthorized extras which the owner may have to pay for is going to help to develop a general feeling of irritation.

There is also the collection of the guarantees. You have stated in your specifications that the roof must be guaranteed; that the waterproofing must be tight and what not, and so you must now begin to gather in these guarantees, issued by the subcontractor and countersigned by the general contractor. (Bear in mind that the final inspection has been made.)

Then we must get receipted bills and evidences of payments to the subcontractors and material men. There must be no liens on the building. All of this has to do with the business administration of the office which will be covered in greater detail in a future talk.

Before closing, I want to say that you must continue to cultivate the interest of the client beyond the point of having delivered a job. Did you ever buy a piece of property and then question your judgment in buying it and after taking title to it be almost sorry that you bought it? Then, on top of that, the real estate agent calls you up and says he has an offer for the property amounting to a few thousand dollars more than you paid for it. Then, immediately, you brighten up and say that you would not take ten thousand dollars profit on that property. That is "after selling"— of a rather crude sort, of course. A finer and nicer type, as far as the architect is concerned, is to take your client through the building, show him where you have saved him money, the results you have accomplished, how much better the building is than he expected it to be; show him that he gets real hot water; talk about the design, the colors, the decorations; and then be on hand to remedy the first sign of trouble. Then visit the building the following month and then the following year. That is a type of "after selling" which the owner is not exactly entitled to but which is good business on the part of the architect.

To Those Who Enter Competitions

By Richard H. Pretz

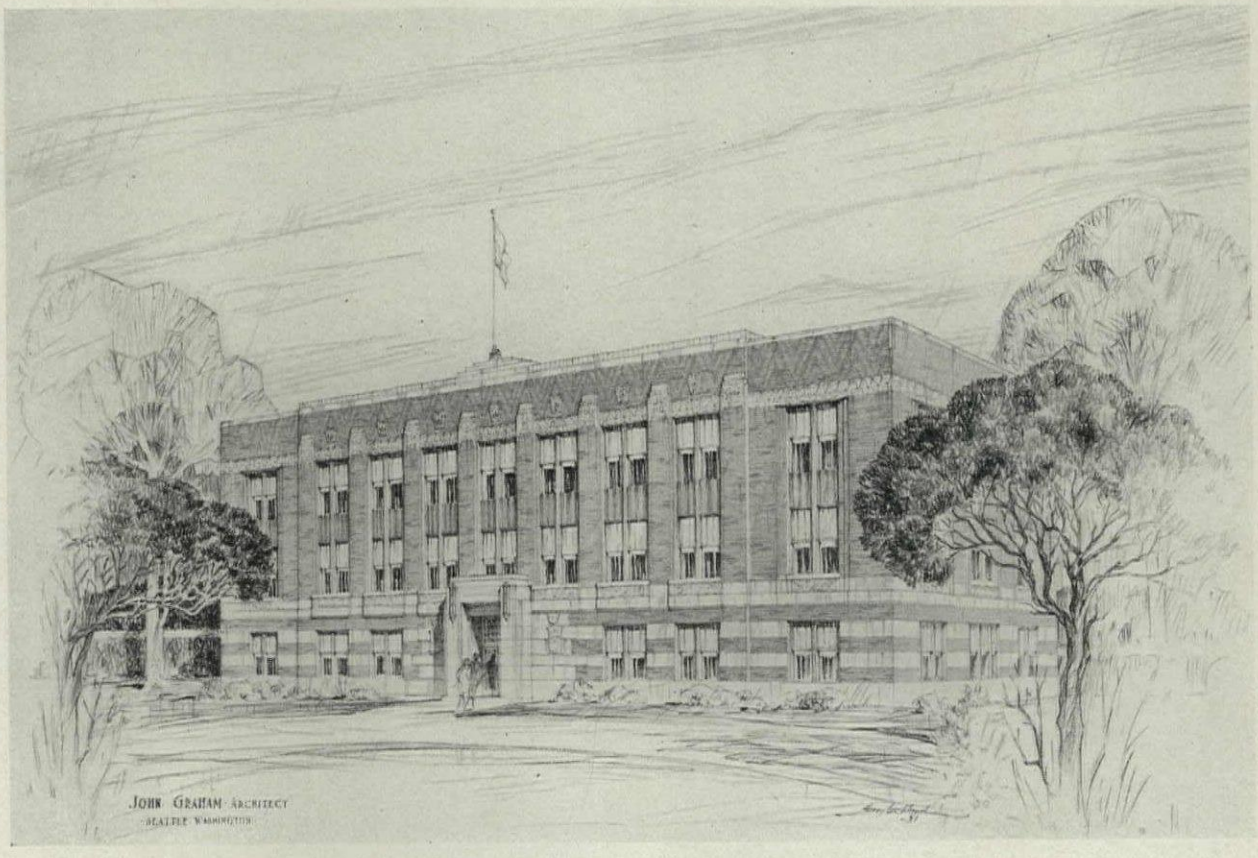
"Individuality is sacred"—*Frank Lloyd Wright*

For you who have awaited the announcement of awards in any one competition and felt discouraged when not placed in the respective judgment, shame on you! If you had arrived at your solution alone, that particular problem was seen through your eyes for the first time in the history of architecture. You were born to give the world a solution that had never been seen before; therefore, remain loyal to the integrity with which your problem was solved.

Your ability is stronger for the study given it—stronger without tradition. If you have expressed yourself, therein lies your strength; and conversely, your strength lies in your ability to criticise yourself. Your work becomes more perfect in proportion to your ability to improve each preceding endeavor. Your improvement will cultivate such fine attributes of character as common sense, courage, magnanimity. You will become judicious, and what you consider perfect today, you will improve tomorrow.

The man who practices to avoid criticism never says anything and, consequently, never does anything. He compromises, is lost in mediocrity and forgotten forever. Love for life wants a vigorous, virile, original character. A character to create and not alone to design. He must control himself for the best he can offer whether as an individual or a cog in some powerful, efficient, beautiful machine.

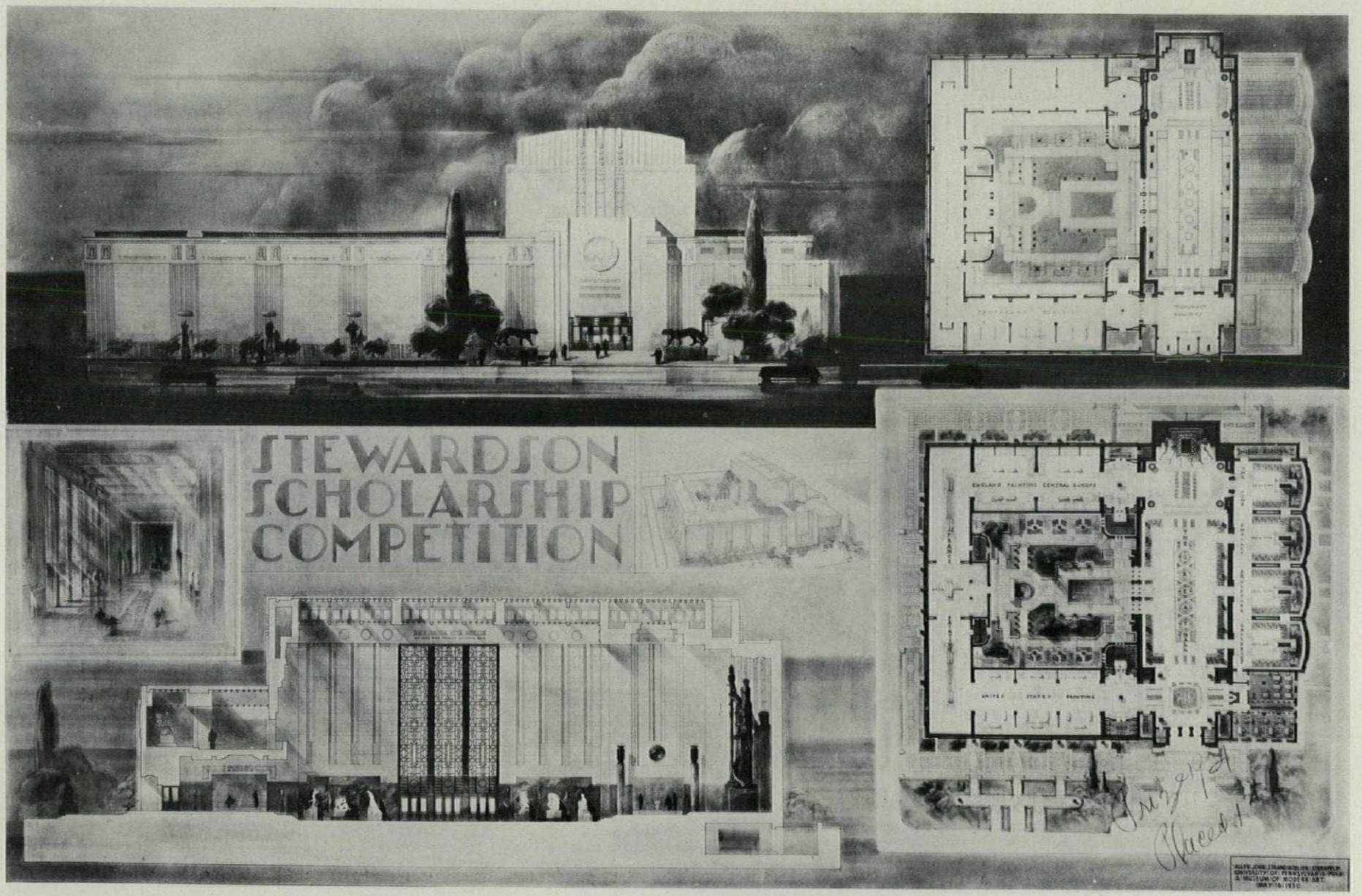
A competition is held because no two architects think alike, nor do any two of the jury. The first fallacy lies in the selection of this jury which, in order to be a criterion, is made up of kindred spirits, prejudiced in their associations. They go to work to agree, setting aside the worst and best of the works until a compromise is reached. So the average competition becomes nothing more than an average of averages. Perhaps more competitions have been won through the competitor's ability to know his jury than to design. I have often known competitions for study abroad to be tackled in just that light, and usually the men who did so have won. I know, for I have both won and lost competitions. More original thought has seemed to be crushed by critics than has been produced. Be fair and face the facts, give each new thought its due time and USE, Criterion of the Ages, will pass judgment.



FROM A PENCIL RENDERING BY HARRY LOCKLAND OF SEATTLE, WASHINGTON

BUILDING FOR UNITED STATES DEPARTMENT OF COMMERCE, BUREAU OF FISHERIES, SEATTLE

John Graham, Architect



WINNING DESIGN FOR "A MUSEUM OF MODERN ART," BY ALLEN JOHN STRANG

JOHN STEWARDSON SCHOLARSHIP COMPETITION FOR 1931, UNIVERSITY OF PENNSYLVANIA

STEWARDSON SCHOLARSHIP AWARDED

The John Stewardson Memorial Scholarship in Architecture for 1931 has been awarded to Allen John Strang. The Scholarship, which is open to students of architecture in the State of Pennsylvania, provides $1000 for the study of architecture abroad. The subject of the program was:

A MUSEUM OF MODERN ART

A citizen has bequeathed to the American Government a superb collection of sculptures, paintings, and prints, all of which are by contemporary artists. The Government, deeply appreciative of this fine gift, has decided to build a museum in the City of Washington, especially for the collection.

The new building will face the Mall, the splendid avenue that is to lead from the Capitol to the Washington Monument, and which will ultimately be lined with fine public buildings. The site selected is a level plot 300 feet square on the east side of this Mall, and is bounded on three sides by narrow streets.

The American Government desires in this building a fine example of the architecture of our own times. Situated at a conspicuous place in the national capital, it will, it is hoped, arrest the attention of thousands of visitors and awaken in them an enduring interest in contemporary art. At the same time it must be remembered that the building will form only a detail in a vast ensemble of buildings and that it must not be of such a character as to compete in interest with the works of art that it shelters. The primary purpose is to provide for these works of art agreeable approaches, quiet settings and the best possible lighting. Especially to be avoided are the monumental vestibules, the imposing porticoes and entrance courts, and the magnificent stairways (exterior or interior) that in most museums impose so heavy a penalty on the visitor.

Great attention should be given to the treatment of the ground around the building and it is expected that a small garden, enclosed or partly enclosed by the Museum, will furnish a fine example of the gardening art of the twentieth century.

Provide, on two floors:

(a) GALLERIES FOR SCULPTURE: One large gallery (9000 square feet) and four smaller galleries (total 8000 square feet). The most important piece of sculpture is a heroic female figure in bronze, 35 feet high, entitled "The Spirit of America in 1917." This must be placed in a niche or recess. There are also four monumental pieces by Bourdelle and Mestrovic; twelve figure pieces (about life-size) in marble and bronze by Maillol, Epstein, Archipenko and Zorach; and fine collections of reliefs, portraits, small bronzes, terra cottas and medals.

(b) GALLERIES FOR PAINTINGS, divided as follows: France—6000 square feet; United States—4000 square feet; Central Europe—2000 square feet; England—2000 square feet.

(c) GALLERIES FOR PRINTS: A collection of 5000 prints will be stored in the basement. These will be exhibited in rotation in three galleries (total 5000 square feet). Provide an elevator from the basement to a service room adjoining these galleries.

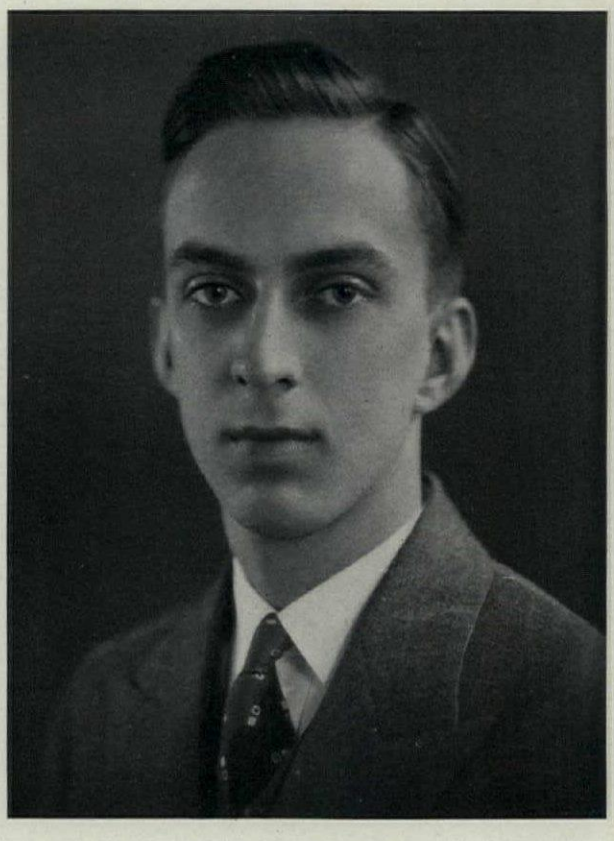
(d) GALLERIES FOR TEMPORARY EXHIBITS: Several galleries (total 8000 square feet) adapted for temporary exhibits of painting, sculpture, or the graphic arts. Receiving room and repair room adjoining.

(e) OFFICES FOR THE DIRECTOR, THREE CURATORS, STAFF OF ASSISTANTS; STORE ROOMS, COAT ROOMS AND TOILETS.

Mr. Strang's winning design is shown opposite.

Allen John Strang, the winner of the John Stewardson Memorial Scholarship, is the son of Mr. and Mrs. A. J. Strang of Richland Center, Wisconsin. He entered the University of Pennsylvania in 1926 to pursue the course in architecture after a year of academic training at the University of Wisconsin. During the summer vacation periods while at school, he worked in the office of Law, Law, and Potter of Madison. Since his graduation last June he has been furthering his professional training in the office in Philadelphia of Harry Sternfeld, his professor of design while at the University and under whose criticism the final competition drawing was developed.

Mr. Strang is a member of the Chi Phi fraternity, The Architectural Society of the University, and Tau Sigma Delta, honorary architectural fraternity. He was awarded the second Samuel Huckel, Jr., Prize in Architecture last year, and received a medal award on a collaborative problem sponsored by the American Academy in Rome. He was also a finalist in the 1930 Stewardson Competition.



ALLEN JOHN STRANG

Mr. Strang is greatly appreciative of the encouragement given by the members of the faculty of the University, especially that of Mr. Sternfeld whose sincerity in the teaching of design has been most inspiring.

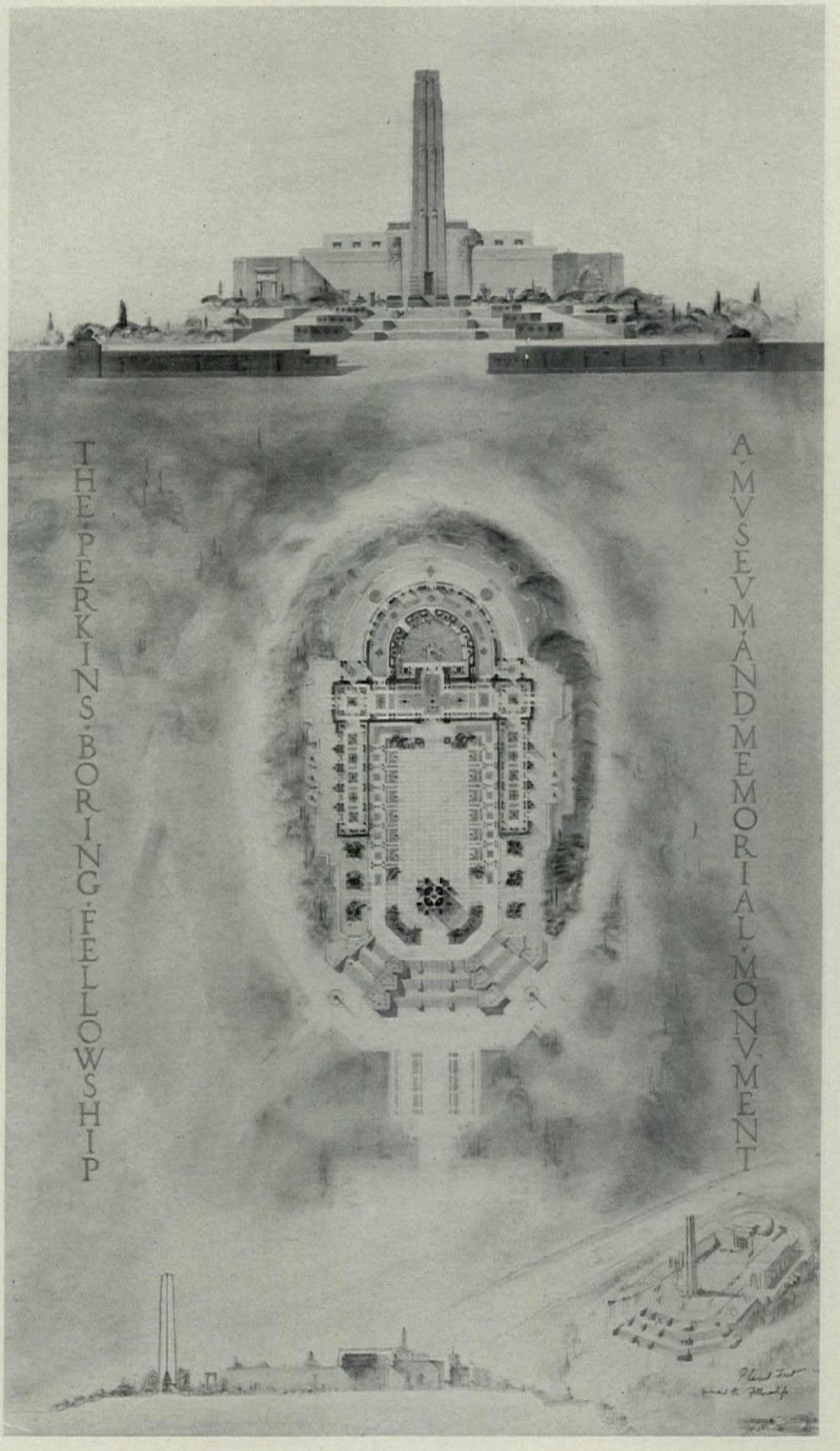
SPECIAL STUDENT SCHOLARSHIPS AWARDED

We regret that owing to lack of space we are unable to present the winning designs in the Competition for the Special Student Scholarships for 1931-32 at the Harvard School of Architecture. The winners are J. Henderson Barr, of Birmingham, Michigan; Mario Joseph Ciampi, of San Francisco, California; and Joseph Earl Trudeau, of Los Angeles, California. Their winning drawings will be shown next month.

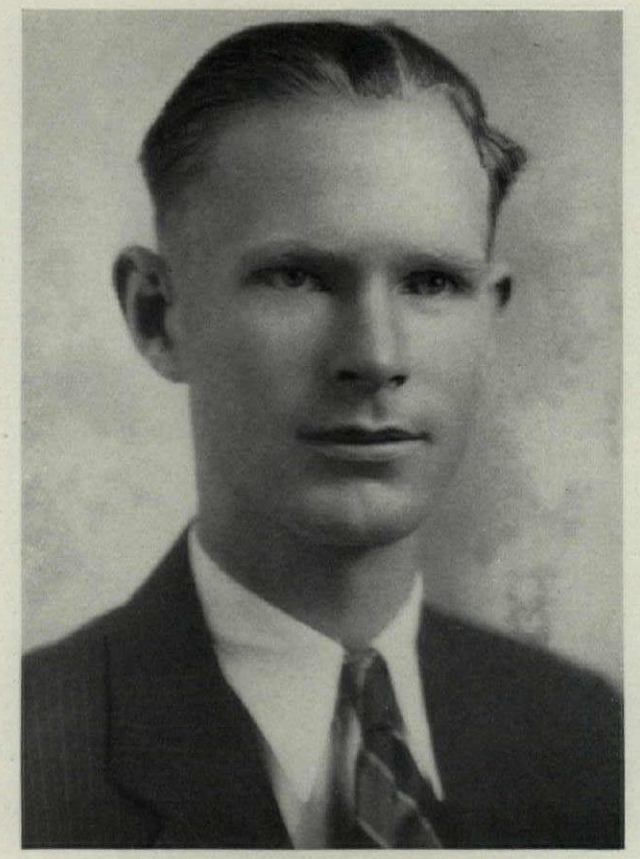
The Massachusetts Institute of Technology Special Student Scholarships have been awarded to Ernest J. Whelan, of East Boston, Mass., and John Fairfield, of Boston, Mass. The subject of the program for the competition was *A Cooperative Market*; the winning drawings will be presented in the August issue of PENCIL POINTS.

NEW YORK UNIVERSITY HONORED

The Committee for the Award of the University Medal of the *Groupe Americain, Société des Architectes Diplomés par le Gouvernement Français,* has unanimously awarded the medal to New York University for the work submitted in the competitions of the Beaux-Arts Institute of Design during the past year.



WINNING DESIGN FOR "A MUSEUM AND MEMORIAL MONUMENT," BY LEON McMINN
COMPETITION FOR THE PERKINS AND BORING FELLOWSHIP,
COLUMBIA UNIVERSITY SCHOOL OF ARCHITECTURE



LEON McMINN

THE PERKINS AND BORING FELLOWSHIP IN ARCHITECTURE AWARDED

The Perkins and Boring Fellowship in Architecture at Columbia University was open for competition to graduates of the School of Architecture of the classes of 1928, 1929, 1930, and prospective graduates of the Class of 1931. It was required that candidates be citizens of the United States.

The winner of this Fellowship receives a stipend of approximately $1,785, and will be required to spend the period of his incumbency in foreign travel and study according to a program to be prepared by himself, under the approval of the President of the University and the Administrative Board of the School. The space of twelve months is fixed as the period of incumbency for the Traveling Fellowship of 1931-1932. The American Academy in Rome will act in an advisory capacity to the Fellow so appointed during his sojourn in Classic lands.

THE PROBLEM

It is proposed to build a Memorial Group—a monument and a museum of one or more buildings—on the property north of the old Billings estate. The land is in upper Manhattan, and has recently been acquired by the City of New York through the munificence of Mr. Rockefeller.

The plot is approximately 600′ long x 300′ to 400′ wide, and generally oval in shape. The group is to be within this area, and may extend to the edge of the present roadway where necessary. The approach to the group is from the south. There are different levels of ground on the plot, and these may be treated as desired by the student, who may include arcades, colonnades, terraces, and statuary in the composition.

The museum is to contain chiefly antiquities of the romantic period of architecture and the exhibits will consist of statuary, architectural fragments, windows, chapels, fonts, altars, and similar objects. The style of the exhibit will be Gothic and Renaissance. The building is not to be in a pronounced historic style, such as Gothic, Romanesque, or Renaissance, but shall be of a type which will easily adapt itself to this problem and in such a way as not to clash with the style of the exhibits. It may reflect, in a symbolic way, the attitude of all the styles of the exhibits, or it may be entirely different from any ideas suggested by the exhibits. It shall be a background for the objects of art which are to be housed therein and placed outdoors in favorable positions.

The museum may be in one or more buildings, but, somewhere on the ground, it must afford a court, or partly enclosed space without roof, which can be used for large public gatherings such as a patriotic assembly on the Fourth of July. If desired, small interior courts for exhibitions may be included. The museum space required is from 50,000 to 60,000 sq. ft. of ground floor. Part of it is to have a clerestory, so that the furnishings of a church, such as windows, lamps, and rood-screen may be exhibited; other parts of it may be two stories high. Provision should be made for administration, public rest rooms, etc.

The memorial monument is to symbolize and honor the Spirit of America and the heroes of America, both of Peace and of War. The form of the architecture, the ornamentation, and the sculpture, are to be abstract and symbolic, without personal portraiture of any kind.

Leon McMinn was awarded the Fellowship at the judgment which took place in the Avery Library, Columbia University. L. Irwin Jones was second alternate in this competition.

The jury consisted of Ralph T. Walker, Archibold Brown, James Gamble Rogers, Robert J. Reiley, and James Kellum Smith. Members of the Staff of the School of Architecture were present at this judgment, but were not on the jury.

Leon McMinn received his degree of Bachelor of Architecture last June. His home is in Jacksonville, Texas. Mr. McMinn's winning design is shown opposite.

BOSTON ARCHITECTURAL CLUB

At the Annual Meeting of the Club, held on Tuesday evening, June 2nd, the following officers were elected: President, Isidor Richmond; Vice-President, Barton P. Jenks, Jr.; Treasurer, Charles G. Loring; Two Directors, Millard Burr Gulick and George R. Hooper. These officers were elected for two years.

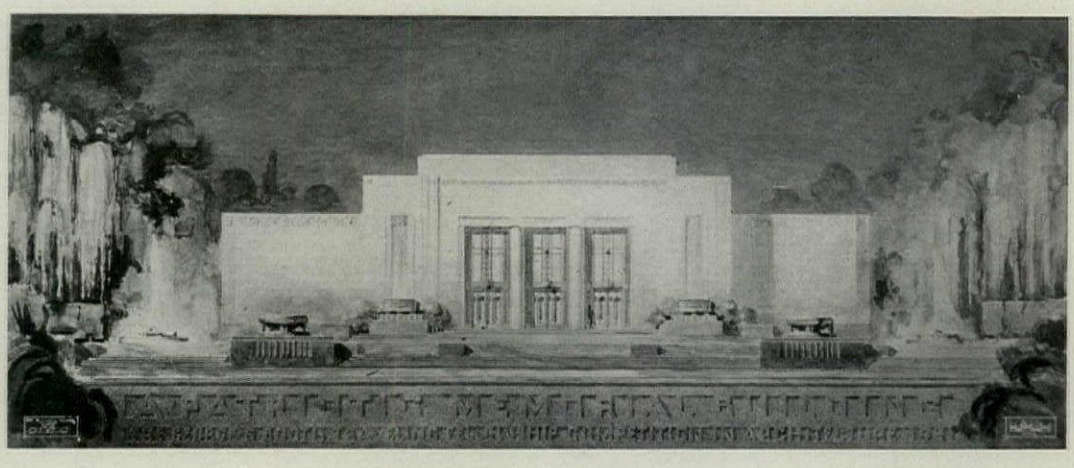
The Tech Scholarship, which entitles the winner to one year's free tuition, has been awarded to Ernest Whelan. Mr. Whelan is employed by the firm of Cram & Ferguson. He joined the Club in 1926 and has been a very active member in the classes conducted by the Club.

The Harvard Scholarship has been awarded to George S. Lewis who is employed by the firm of Maginnis & Walsh. Mr. Lewis joined the Club in 1926 and has been an active member in the classes as well as serving on various committees.

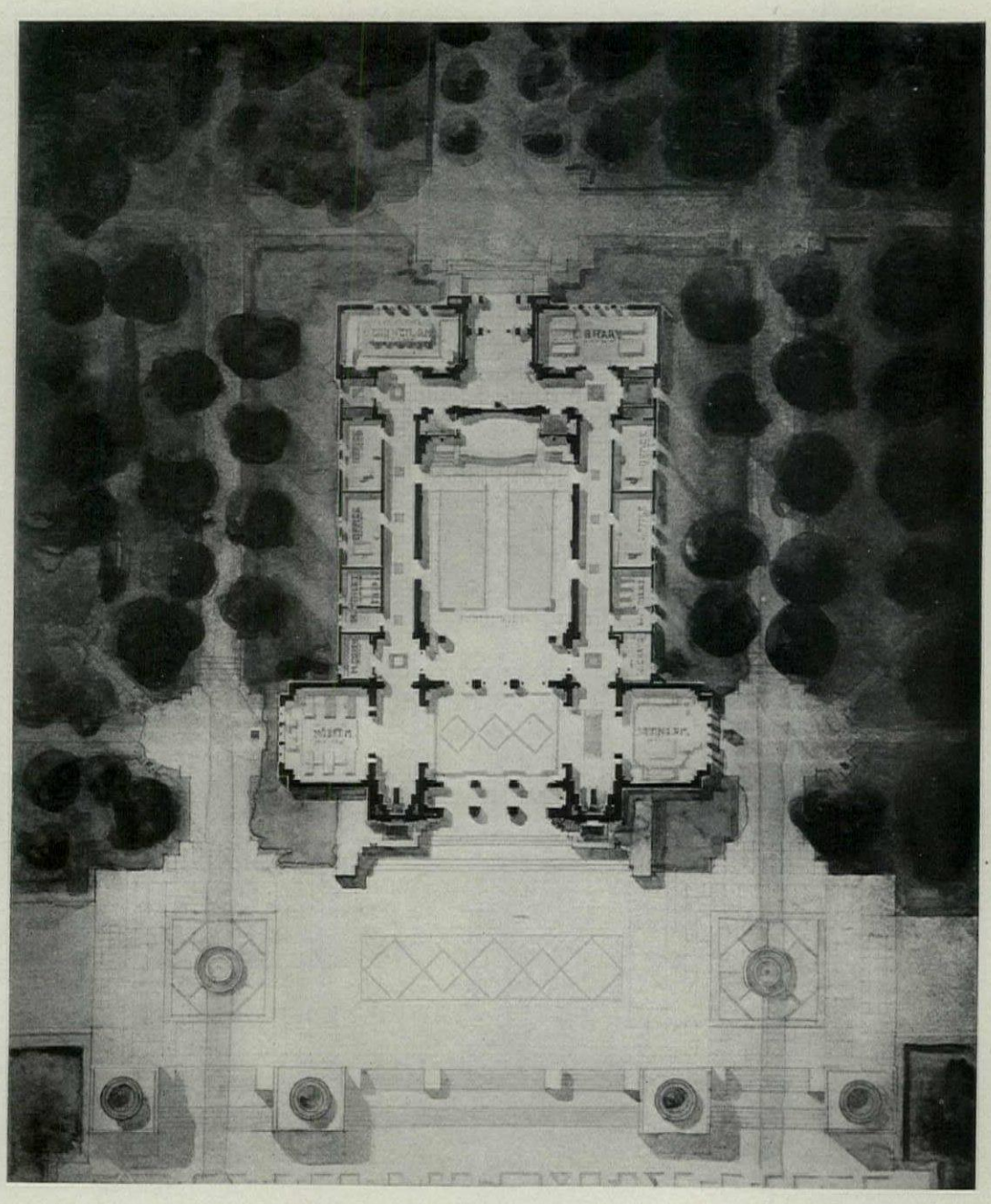
At a meeting of the Atelier of the Club held on Tuesday, May 26th, the following officers were elected for the coming year: Massier, Russell H. Brown; Sous Massier, George S. Lewis; Treasurer, Joseph DiStefano, Jr.; Scribe, Robert Minot.

WALKING COMPANION WANTED

Dexter Morand, 19 Vivian Avenue, Wembley, Middx., England, is planning a walking trip through Kent some time this summer with the object of gathering data for a book on the county. He would like to hear from any of our readers who would be interested in a leisurely ramble having for its object the study of the smaller buildings.



ELEVATION



PLAN OF WINNING DESIGN FOR "A PATRIOTIC MEMORIAL," BY LORNE E. MARSHALL

COMPETITION FOR THE GEORGE G. BOOTH FELLOWSHIP, 1931—UNIVERSITY OF MICHIGAN

FREESE'S CORNER

Editor's Note:—*As announced last month, Ernest Irving Freese will answer one inquiry a month on problems involving geometry or mathematics that have practical value to the draftsman or in one way or another to drafting room work.*

Address your problem to Freese's Corner, PENCIL POINTS, *419 Fourth Avenue, New York.*

'Smatter? Can't you think when you're not working? Or does thinking interfere with working?

Anyhow, the "go" signal is wide open on this particular corner . . . . awaiting the clang of the ambulance. Some one has died of fright. To relieve the "depression" still further, I'm asking you to pull the trigger on the following five-shooter. One of my letter-writing admirers calls this "Kindergarten Stuff" . . . . so it may not prove effective: just five simple queries picked from Part 1 of the "Geometry," published in the August, 1929, issue of PENCIL POINTS. Put an ad in *The Mart*. Maybe some one has *two* copies.

1: A bay window is desired whose shape shall be a five-sided segment of a regular octagon. The allotted width of same is laid off on the line of the wall from which the bay springs. Can you draw the correct plan of this five-sided bay directly in its appointed place using neither scale nor compass?

2: The roof of the above bay is 12:12 pitch. Can you name the triangle whose hypotenuse will at once place the intermediate hip lines in elevation?

3: The span of a gambrel roof is laid off on the board. Can you immediately establish the architecturally-correct shape of this gable, and the properly-proportioned eave overhang, and the compass centers for the roof sweeps, with the T-square and one triangle?

4: Can you unhesitatingly divide a quadrant arc into six equal parts with the T-square and two triangles?

5: Can you exactly divide any rectangular line on the board into three equal parts with the T-square and one triangle?

Shoot!

RESOLUTION OF THE INDIANA SOCIETY OF ARCHITECTS IN REGARD TO ADVERTISING OF BUILDING MATERIALS

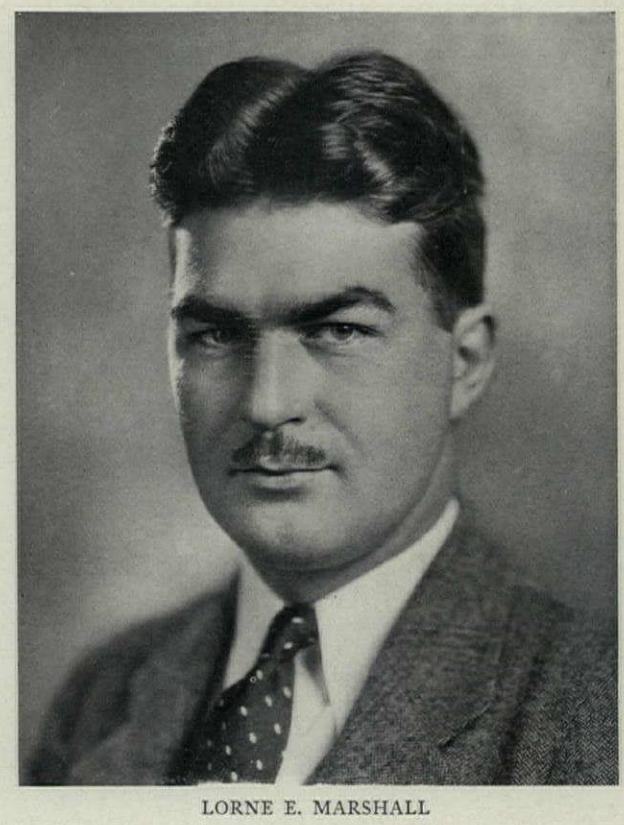
Believing that economy in construction, convenience of arrangement and attractiveness in design can best be secured for any building, large or small, by having it planned by an experienced architect, therefore be it resolved:

"That the Indiana Society of Architects questions the value of the advertising of building materials in newspapers, magazines, or other mediums that include with the advertisement illustrations and descriptions of poorly designed work not executed by Architects.

"In the opinion of the Society the publication of stock plans and illustrations of poorly designed buildings in connection with the advertising of worthy building materials leaves a false impression in the minds of the public as to the quality of the materials, is misleading as to what constitutes good design, and should be discontinued."

THE CINCINNATI ARCHITECTURAL SOCIETY

The winter activities of the Society were brought to a close the end of May by the annual baseball game, followed by a dinner. Architects and draftsmen alike declared a holiday and a good time was had by all. The weekly life drawing class will continue throughout the summer.



LORNE E. MARSHALL

GEORGE G. BOOTH FELLOWSHIP AWARDED

The problem this year was a memorial building to house an auditorium, a museum, a library, and offices suitable for units of The American Legion, Sons and Daughters of the American Revolution, and Red Cross. Only two weeks were allowed for this competition, the students working without criticism. The work of the first week was carried on during the spring recess; the second week the regular classes outside of design had to be attended.

The stipend of the fellowship is $1200, and the competition is open to all graduates of the College of Architecture, University of Michigan, who are not yet thirty years of age. Seniors who expected to graduate in June were also admitted. Eighteen designs were submitted this year, five of these from graduates now residing in various parts of the United States and one who is now a resident of Paris.

The winner this year is Lorne E. Marshall, a native of Strathmore, Province of Quebec, Canada, who graduated last month. The award was made to Mr. Marshall largely on his plan. William B. Wiener, of Shreveport, Louisiana, who graduated in 1929, was a close second.

The jury this year consisted of the following: B. V. Gamber, President of the Detroit Chapter, American Institute of Architects; Amadeo Leone, of Smith, Hinchman & Grylls, Architects and Engineers; Herbert G. Wenzell, of George D. Mason & Company, Architects; Raymond Carey, Architect; Claire W. Ditchy, Architect—all of Detroit—and five members of the faculty of the College of Architecture. The winning design is shown opposite.

A CORRECTION

It has been called to our attention that the caption, "The Old Mint, New Orleans," printed beneath the reproduction of Edward M. Schiwetz' lithograph, on page 365 of the May issue, is incorrect. This should have read, "The Old Arsenal, New Orleans."

BUSINESS MEN'S ART CLUB OF NEW YORK

We take pleasure in bringing this new and flourishing organization to the attention of our readers on account of the facilities it offers in the pursuit of the various kinds of sketching which we have always believed to be a tremendously valuable part of the draftsman's training. Membership is open to architects and draftsmen over thirty years of age.

The dues for the balance of this year are $7.50, and an initiation fee of $5.00. For this members are entitled to (a) the use of the Club's large studio with all facilities on the 37th floor of the Barbizon-Plaza; (b) a meeting every Thursday night where a model is furnished; (c) a monthly meeting (generally on a Monday night) when there is a talk by some well known artist or speaker or some well known artist will actually paint and finish a picture for instruction; (d) criticism every meeting night, of anything you care to bring in, by a well known artist; and (e) as an extra curricular activity every Tuesday night special painting and drawing class from life under the instruction of Mr. Edward Dufner. For this the Club collects an extra fee of $2.00 per lesson.

In addition to all the above the Club holds an annual two weeks' exhibit of its members' works, furnishing the space, the catalogues, and the publicity.

For further information address the president, Conrad A. Dieterich, 40 West 40th St., New York.

AWARDS ANNOUNCED FOR 1930 BRIDGES

The Washington Avenue Bridge in Chicago and the Delton Bridge in Sauk County, Wisconsin, have been judged to be the most beautiful bridges of their classes built in 1930 in the United States and Canada. They will consequently be decorated this fall with bronze plaques by the American Institute of Steel Construction. A jury of architects and engineers, acting for the Institute, has just announced its decision.

The Washington Avenue Bridge is a bascule bridge over the Chicago River which cost $1,750,000, and is owned by the Department of Public Works of Chicago. It was designed by Thomas G. Pihlfeldt, engineer of bridges, and fabricated by the American Bridge Company. The bridge span is 239 feet and the roadway 90 feet wide. It was selected by the jury as a most pleasing solution of a most difficult bridge design problem. The award was made in that class of large bridges costing over $1,000,000 to erect, of which there were a number during the past calendar year. Honorable mention in this class was given to the Mid-Hudson Bridge at Poughkeepsie, New York, a suspension bridge designed by Ralph Modjeski and Daniel Moran for the State of New York, and likewise erected by the American Bridge Company. Second honorable mention was awarded to the Montreal Harbour Bridge, fabricated by the Dominion Bridge Company, Ltd., for the Harbour Commissioners of Montreal. This is a cantilever bridge designed by Monsarrat & Pratley, Montreal.

The jury exercised its prerogative in deciding not to make awards in Class B because no entrant of sufficient merit was recorded. This class included bridges costing between $500,000 and $1,000,000 to erect. Of those bridges costing less than $500,000, grouped in Class C, the steel arch highway bridge at Delton, Sauk County, Wisconsin, was selected as the most beautiful. This bridge cost approximately $54,000. It was designed by the Wisconsin State Highway Commission and fabricated by the Lakeside Bridge & Steel Company. It is an arch bridge having two spans of 218 feet 10 inches each, and carrying a roadway 27 feet wide. Honorable mention in this class was awarded to the Lachine Bridge across the Lachine Canal at 18th Avenue, Lachine, Canada. This bridge cost but $3,100 to erect. It was designed by R. Dorion, City Engineer, and fabricated by the Dominion Bridge Company, Ltd. The bridge is but 47 feet in span and has a roadway of 14 feet clear with two sidewalks.

The jury making the selection consisted of Francis Lee Stuart, Consulting Engineer, President of the American Society of Civil Engineers; Robert D. Kohn, Architect, President of the American Institute of Architects; Frederick L. Ackerman, Architect; Dr. William H. Burr, Consulting Engineer; and B. F. Betts, Editor of *The American Architect*. The bridges selected as the most beautiful in their respective classes will be decorated with bronze plaques by the Institute, and the engineers, architects, and builders will receive special diplomas.

BROOKLYN CHAPTER A.I.A.

The Brooklyn Chapter, American Institute of Architects, held its annual meeting at the Crescent Athletic Club, Brooklyn, Monday, the 25th of May, and awarded prizes in competition of its student affiliates in the sixth annual competition calling for *A Parkway Bridge*. First prize, $75, was awarded to Robert Hillier; second prize, $50, to Robt. Edwards; third prize, $25, to Ham. Reese.

Frederick Amundsen won the Chapter's $50 scholarship award for upper classmen in the department of architecture of Pratt Institute for his execution of *A Gas Filling Station*. First honorable mention was won by Hamilton Reese. Lester B. Pope, chairman of the education committee of the Chapter and instructor of Pratt Institute, made the presentations.

During the annual reports of officers and committees the membership committee reported a present membership of 102, exceeding last year's number by nine.

The officers re-elected were Charles C. Wagner, president; Wm. A. Sanders, vice president; George F. Kiess, secretary; Herbert C. Bowman, treasurer; Ralph M. Rice, surveyor. Board of Directors was elected as follows: Adolph Goldberg, for one year; Stephen W. Dodge, Lester B. Pope, and Robert F. Schirmer, for two years.

The A.I.A. 1932 convention delegates include: Charles C. Wagner, William P. Bannister, William A. Sanders, J. Monroe Hewlett, and John B. Slee; the alternates: Alexander Mackintosh, Herbert C. Bowman, Daniel D. Streeter, John P. Voelker, and George Francis Kiess.

James C. Beaudreau, director of Pratt Institute, and H. R. Dowswell of Shreve, Lamb & Harmon, architects of the Empire State Building, were the speakers.

LONG BEACH CLUB GIVES HONOR AWARDS

The Long Beach [California] Architectural Club, desiring to encourage the appreciation of Architecture in Long Beach, by publicly recognizing exceptional architectural merit in any building executed by a Long Beach Architect, has established a series of awards to those by whose ability, skill and cooperation such works were created. The awards shall be known as the Honor Awards of the Long Beach Architectural Club and will be classified as follows: Section 1. Dwellings; Section 2. Apartments and Hotels; Section 3. Public Buildings; Section 4. Commercial Buildings; Section 5. Miscellaneous Buildings; Section 6. Landscape Work.

At the time we go to press the awards have not been announced, but the information will be made public the first part of this month. Anyone interested further may write to Natt Piper, Chairman of the Award Committee, 441 East First Street, Long Beach, California.

ALLEN H. STEM

1856—1931

Allen H. Stem died on May 19th, at St. Paul, Minn., after an illness of three weeks.

Mr. Stem's best known work was his part in the designing of the Grand Central Terminal in New York. He also designed the St. Paul Auditorium, the Hotel St. Paul, the St. Paul Athletic Club, the medical buildings at the University of Minnesota, the Denver Auditorium and the Michigan City (Ind.) Library. He designed the important passenger terminals of other railroad lines and monuments of his work extend from New York to Seattle.

Mr. Stem lived at Dellwood, White Bear Lake. He was a member of the Minnesota, the Town and Country and White Bear Yacht Clubs. He was born in Van Wert, Ohio, and attended the public schools there. Later he studied at the Indianapolis Art School. He formed a partnership with J. H. Stern in Indianapolis in 1880, which lasted four years until Mr. Stem moved to St. Paul.

For thirty years Allen H. Stem was a partner of the late Charles A. Reed in the architectural firm of Reed & Stem. Mr. Reed died in 1911, before the completion of the Grand Central Terminal, in the designing of which Reed & Stem collaborated with Warren & Wetmore. The firms also collaborated in the design of the Hotel Biltmore.

Mr. Reed was executive head of the New York Central & Hudson River Railroad Company Architects, which designed the station. At the opening of the station in 1913 Warren & Wetmore were given credit for the broad outlines of design and general æsthetic treatment and Reed & Stem for the "engineer-architect" feature of the vast work.

More than 100 railroad stations were designed by Reed & Stem, including stations in Norfolk, Va., Detroit, and Utica, N. Y. Among the roads for which they designed stations were the Great Northern, the Northern Pacific, Great Western, Michigan Central and Norfolk & Western.

A LETTER FROM H. L. WITHINGTON

Editor's Note:—*Mr. Withington is the Manager of Sales Promotion of the Armstrong Cork Co. Architects and builders wishing to comment on Mr. Withington's letter may address him in care of* PENCIL POINTS *or at his company's office at Lancaster, Pennsylvania.*

"The writer has just finished reading with great interest in your current issue the symposium in which architects and building material producers discuss their mutual problems. It was noted that only one contributor mentioned the permanent architectural and building material exhibits which are now organized and in operation in many of the larger cities; in particular the Architects' Samples Corporation of New York, 'The Home in the Sky' Exhibit in Cleveland, and the Architects' Building Material Exhibit in Indianapolis.

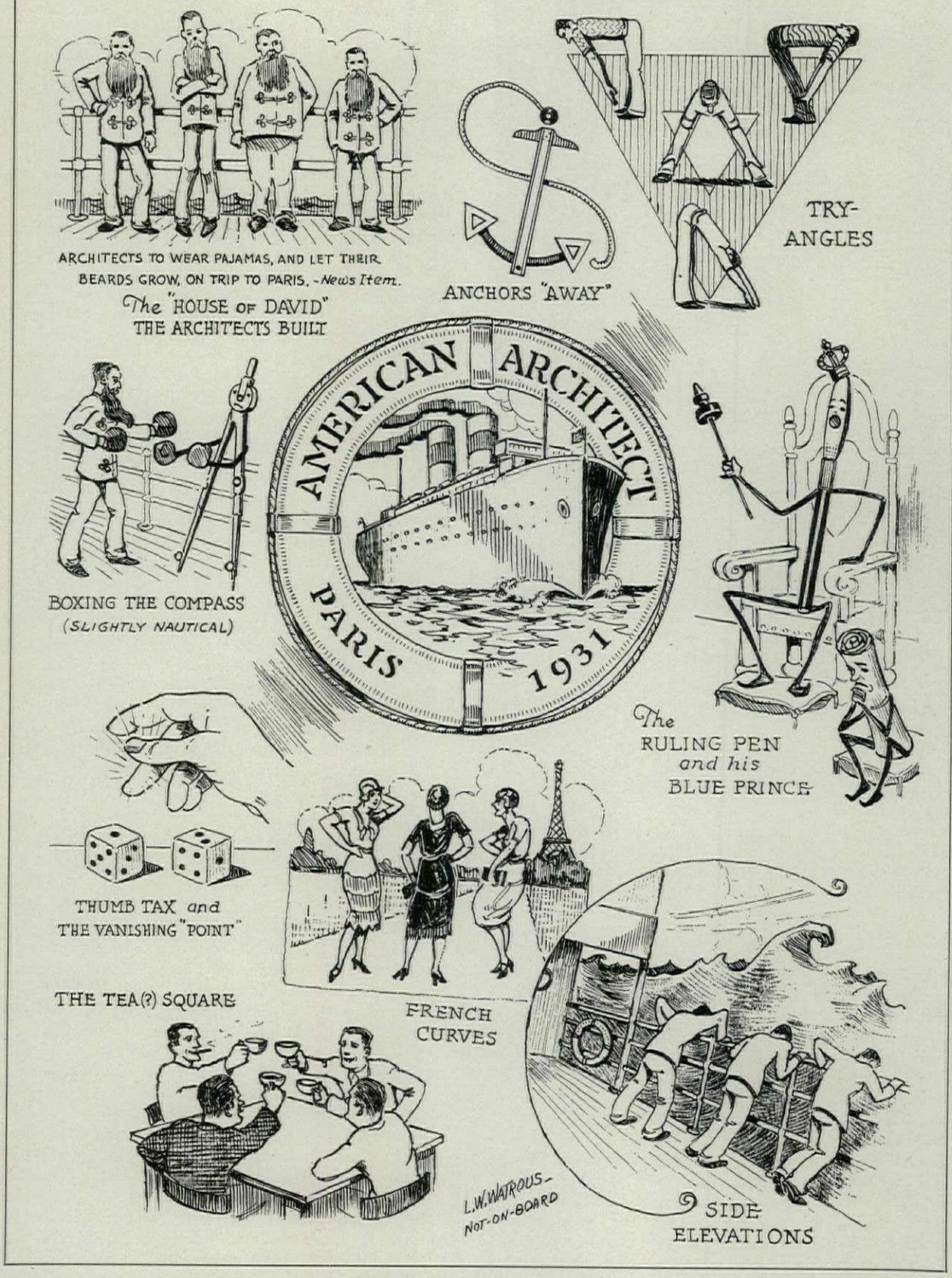
"We believe that a great many manufacturers of building material would like to know just what the attitude of architects and builders is toward these permanent exhibits. In particular, we would find it helpful to know to what extent the average architect attends—with or without a client—such a building material exhibit, whether he prefers such an exhibit to regular promotion calls by the manufacturers' salesmen, and whether or not the architect learns enough about the manufacture, installation and uses of the products from his attendance at such exhibits to make the time he spends there worth while.

"Since these building material exhibits are being developed and put into operation in more and more cities throughout the country, we believe that an answer to these questions would be extremely helpful to all building material producers in their desires and efforts to render the right kind of service to the architectural profession. Whatever action you wish to take upon this suggestion and whatever information your publication can secure on this subject will be greatly appreciated."

TAU SIGMA DELTA HONORARY FRATERNITY INSTALLS NEW CHAPTERS

The Lambda Chapter of Tau Sigma Delta Honorary Fraternity in Architecture and Allied Arts was installed on June 3rd, 1931, at the School of Architecture at University of Southern California, Los Angeles, California. The Charter membership consists of three Honorary Faculty Members, Professors Arthur Clason Weatherhead, Dean; Verle Lincoln Annis; Charles Raimond Johnson; and Five Senior Members: Thornton Montaigne Abell, Christian Eberle Choate, John Francis Meehan, Stanley Leroy Melone, and Walter Harry Tyler; and four Junior Members: Boris Robert Leven, Richard Nye Merrill, Jr., Albert Nozaki, and Edward Suyemitsu Okubo. The installation took place at the Student Union and several alumni members of the Fraternity from other universities assisted Past-Grand Master Gilbert Stanley Underwood, Architect, in carrying out the ceremony.

The Mu Chapter of Tau Sigma Delta Honorary Fraternity in Architecture and Allied Arts was installed at the Department of Architecture at the University of Texas, Austin, Texas, on May the 29th, 1931. The Charter membership consists of the Professors, Goldwin Goldsmith, Chairman, Department of Architecture, and Walter Thomas Rolfe; and Four Senior Members: Robert Logan Knapp, Richard S. Rowe, Lily Rush Walker, Walter Harris, Jr.; and five Junior Members: Miriam E. Storrs, Joe C. Lair, Wilburn Wm. Rheinlander, Nancye Tacquard, and Arthur Mathis, Jr. The installation ceremony was carried out by Ernest H. Trysell, Grand Chapter Recorder, who came from Detroit purposely for the installation.



A Few Chips from the Log of the Good Ship "American Architect,"
Drawn by L. W. Watrous, N.O.B. (not on board)

Some impressions of the Beaux-Arts Architects en route to the Ecole in Paris to present a flagpole to their Alma Mater. After much debating the name of the boat, the "S.S. American Banker," was changed for the voyage to the "American Architect," and not the "American Tanker," which was the first thought of the voyageurs.

HERE AND THERE AND THIS AND THAT

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—A. D. Roberts, Bell, California.
Class II—Benjamin Bailyn, West New York, N. J.
Class III—William F. Smith, III, Rochester, N. Y.
Class IV—Dave Chapman, Evanston, Illinois.
Good Wrinkle—Frank W. Bentley, Jr., Missouri Valley, Ia.

Your Conductor is going on a vacation and had all sorts of ideas about putting this most important section of the magazine together a week ahead of time. Just as we were on the verge of doing so our telephone bell rang. It was our old friend Salvadore Gloop. Mr. Gloop has just returned from his swimming in Venice, where he informs us he was presented with numerous cups and medals. He jumped at the idea of conducting our department for August. We understand he has some brilliant thoughts for your entertainment, so don't forget to read what he has to say in the next issue!

AMBITION

By Benj. Bailyn, West New York, N. J.

(PRIZE—*Class Two, June Competition*)

All architects are human,
After all it's not a sin,
They rest their feet upon a seat,
And dreaming they begin.

It is a quite accepted fact,
You needn't smile or laugh,
We dream of things we sometimes lack,
And what we cannot have.

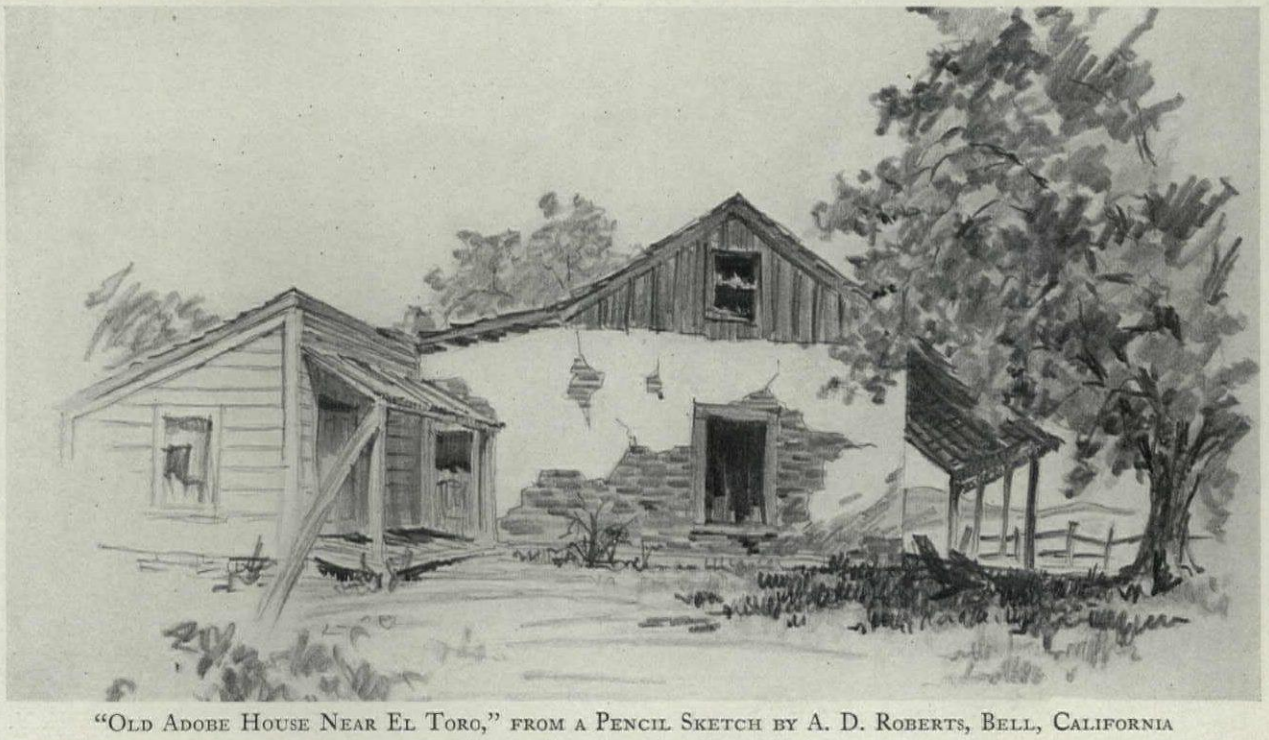
So let us not too hastily,
Condemn this architect,
For dreaming things that surely are
His pleasure to erect.

Vague thoughts of massive castles,
And of Churches large and fine,
Even those of great memorials
Pass through his sleeping mind.

The Empire State is but a tent,
Compared with what he sees.
It rises up into the clouds
It's towers often freeze.

But day dreams, it's a pity,
Do not last so very long.
And he roughly is awakened,
By a file clerk's plaintive song.

He looks around him as if lost,
The place does not seem large,
His pencil starts to work once more,
On a puny tin garage.



"OLD ADOBE HOUSE NEAR EL TORO," FROM A PENCIL SKETCH BY A. D. ROBERTS, BELL, CALIFORNIA
(PRIZE—*Class One—June Competition*)

THIS REMARKABLE portrait study of Dave Chapman was taken in the drafting rooms at good ole Armour Tech and is shown herewith for the edification of the 125 souls, 125, who comprise the department of architecture of that institution. The sly photographer snuk up on Mr. Chapman while he was hard at work on his rendering of the First National Gamboge Plant for Wearnuts. Note the dynamic symmetry of the composition! There is no question but that Mr. Chapman will be heard from again as we are sending him the prize in Class IV.

FRED H. ELSWICK, of Louisville, Ky., says:

"It isn't necessary to be queer to be an architect, but it helps."

"A lot of good draftsmen who used to draw good plans can hardly draw a good breath now."

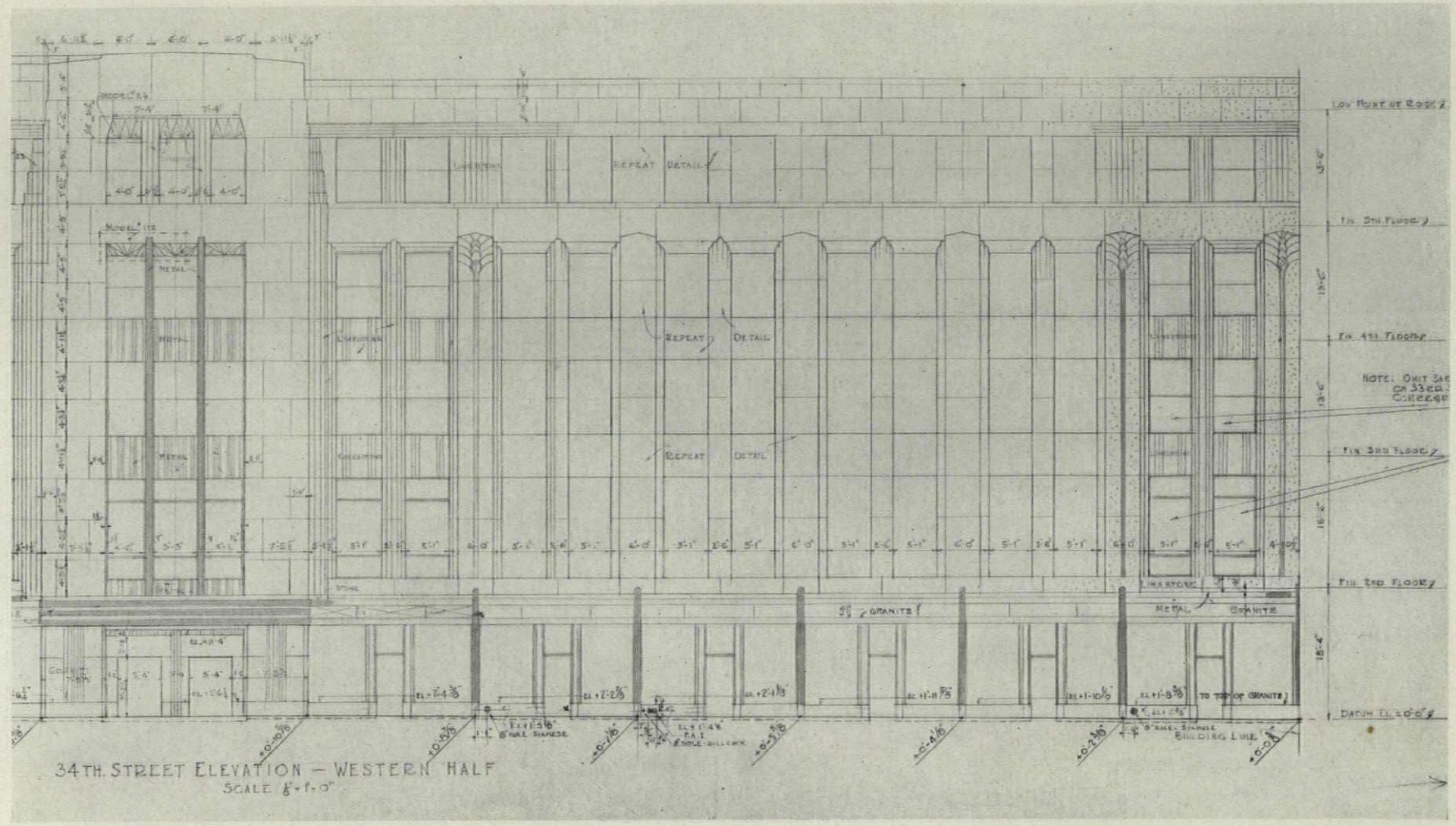
"If our present prosperity continues it won't be long before the only draftsmen who have jobs will be those who open and close windows in government office buildings."

We might call the above "cracks" the Optimist's Ever Looking for the Sunshine Corner!

A HANDY METHOD of holding end of rolled print or drawing is suggested by Frank W. Bentley, Jr., of Missouri Valley, Iowa:

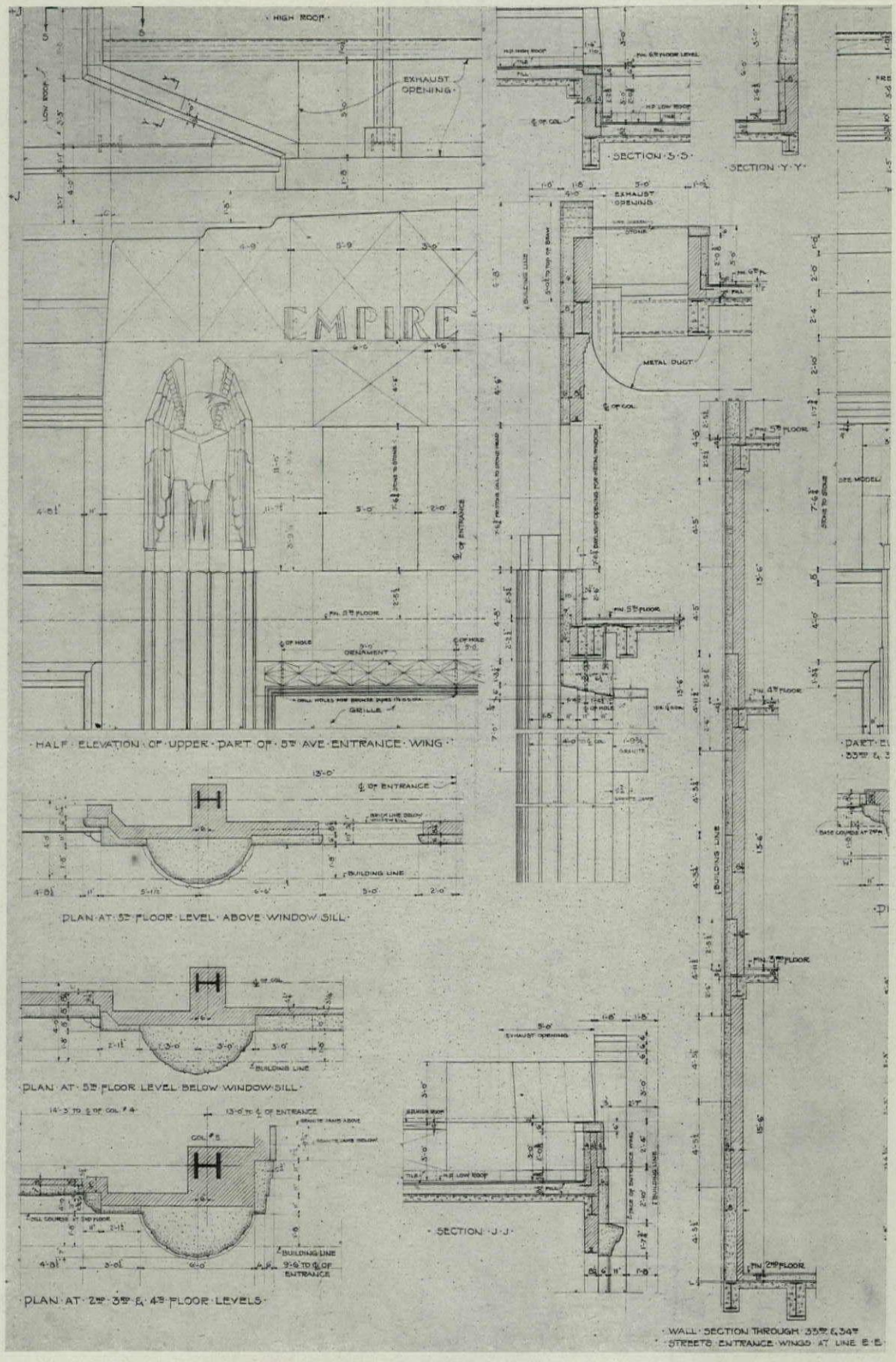
"Long prints or drawings which have been rolled and are necessarily kept rolled for convenience or preservation are often a mean thing to handle alone when inspecting them. Back rolling the drawing or print can be done of course, but this is frequently very damaging to the cloth or paper. If one cannot find something handy and convenient to lay on one end to hold it down, the photograph above shows a quick and ready method. Open the first half of the two-foot rule to a wide angle. Open the next two sections a bit and slip the end of the drawing into the flat vise like affair thus formed. Do not close them entirely as some rules of this type have small brass dowels which may scratch the paper. Just close them lightly. It will nicely and securely keep the end of the paper or cloth from rolling or curling up again, leaving the right hand free to write, sketch, or follow details of the drawing with the point of the pencil."

The Fellow Who Erected the World's Tallest Building Pitches His Tent—By William F. Smith III, Rochester, N. Y.
(PRIZE—*Class Three—June Competition*)



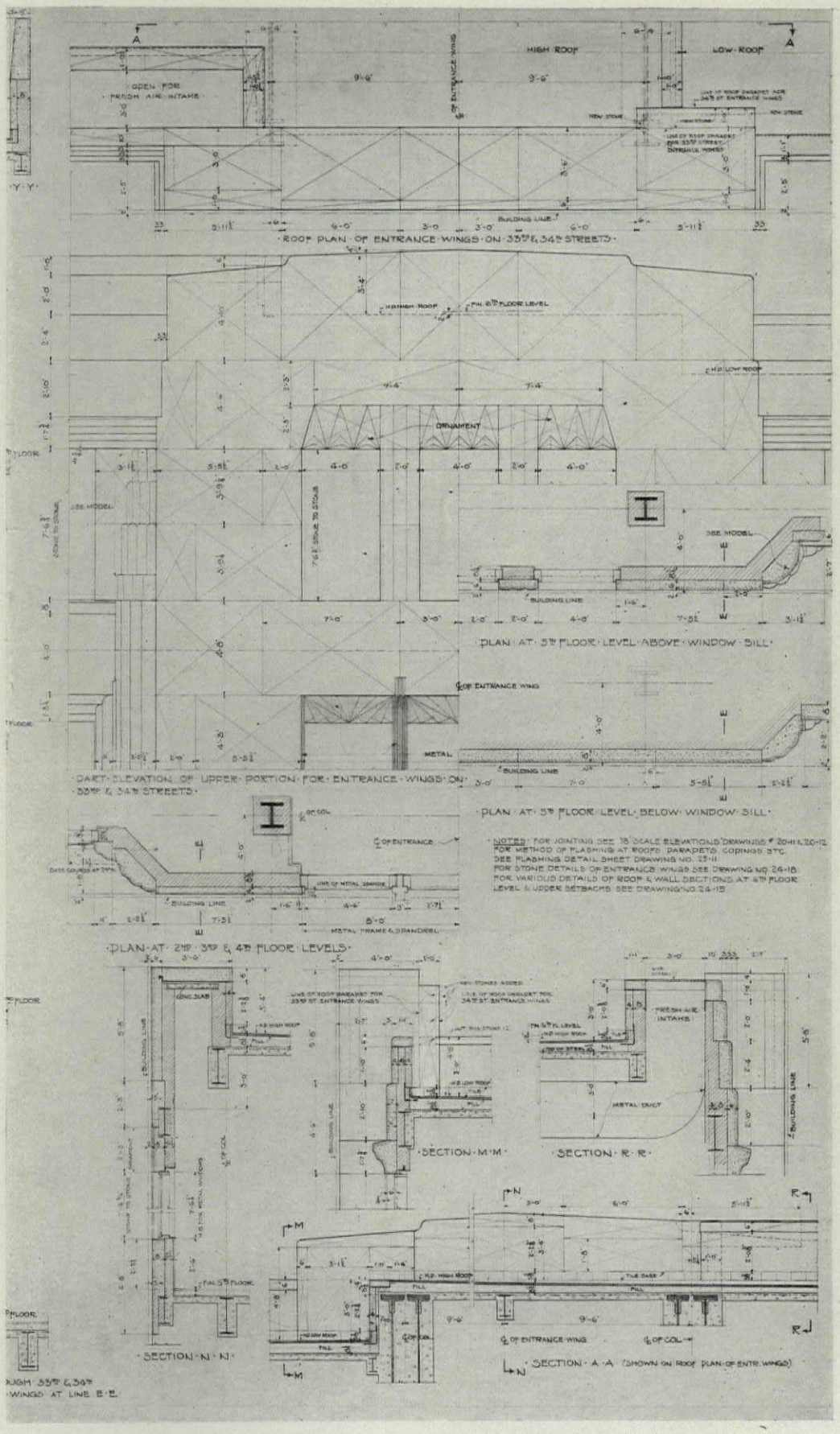
EMPIRE STATE BUILDING, NEW YORK—PORTION OF 34TH STREET ELEVATION, FIRST FIVE STORIES

SHREVE, LAMB, AND HARMON, ARCHITECTS



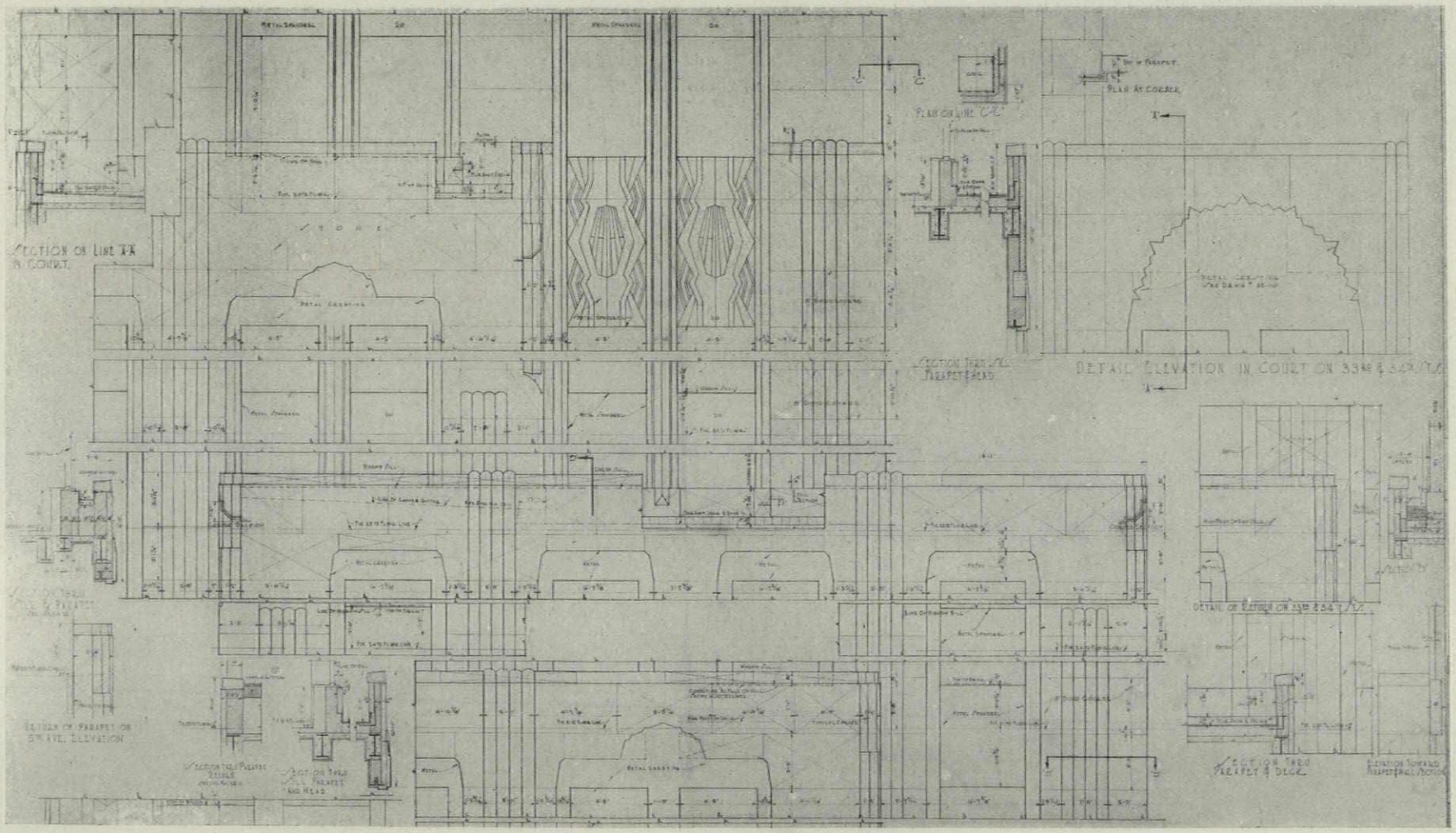
EMPIRE STATE BUILDING, NEW YORK—DETAILS OF LOWER STORIES

SHREVE, LAMB, AND HARMON, ARCHITECTS



EMPIRE STATE BUILDING, NEW YORK—PORTION OF SHEET ON FACING PAGE

SHREVE, LAMB, AND HARMON, ARCHITECTS



EMPIRE STATE BUILDING, NEW YORK—ELEVATION DETAILS OF STONE AND METAL, LOWER STORIES

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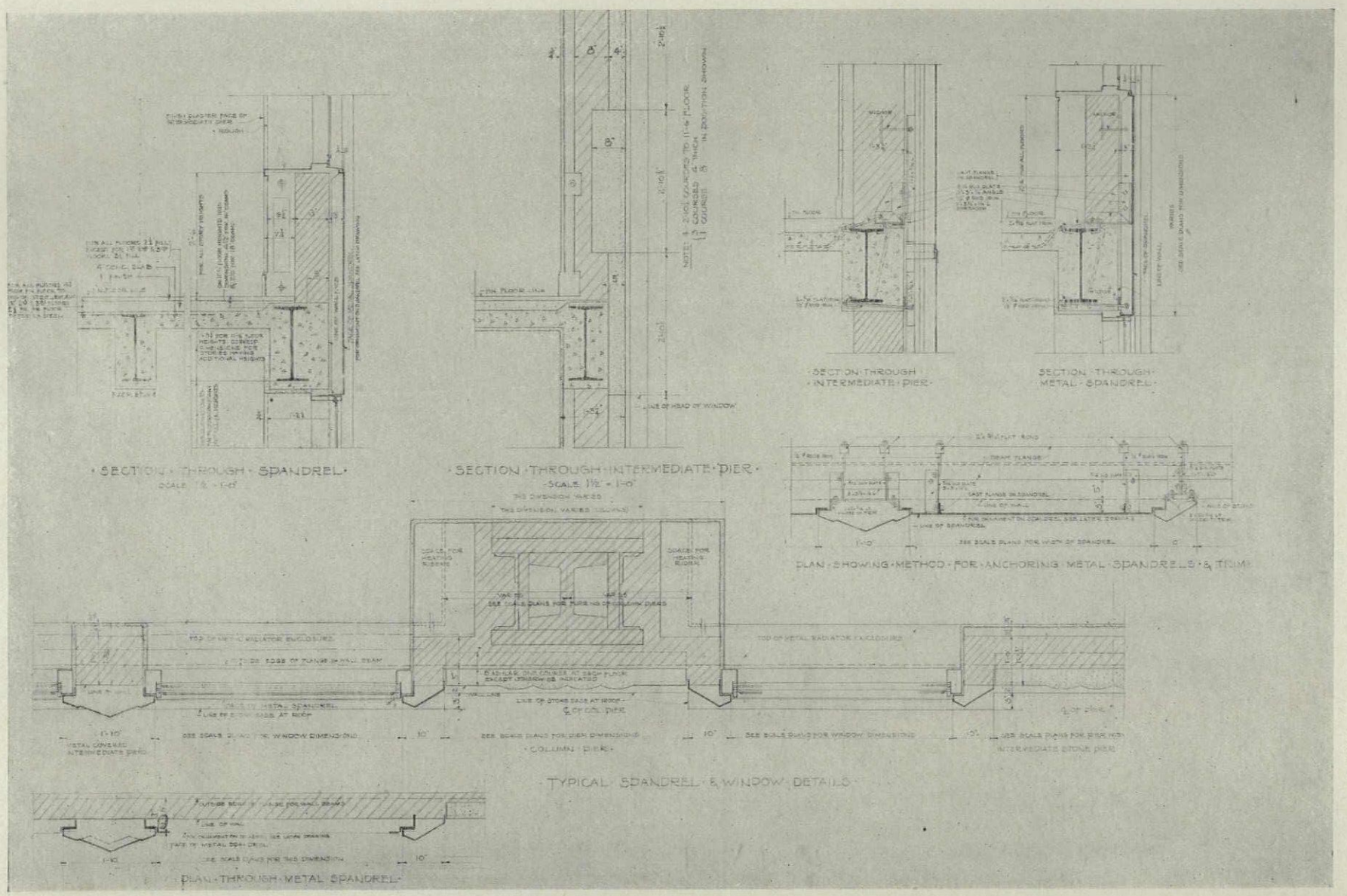
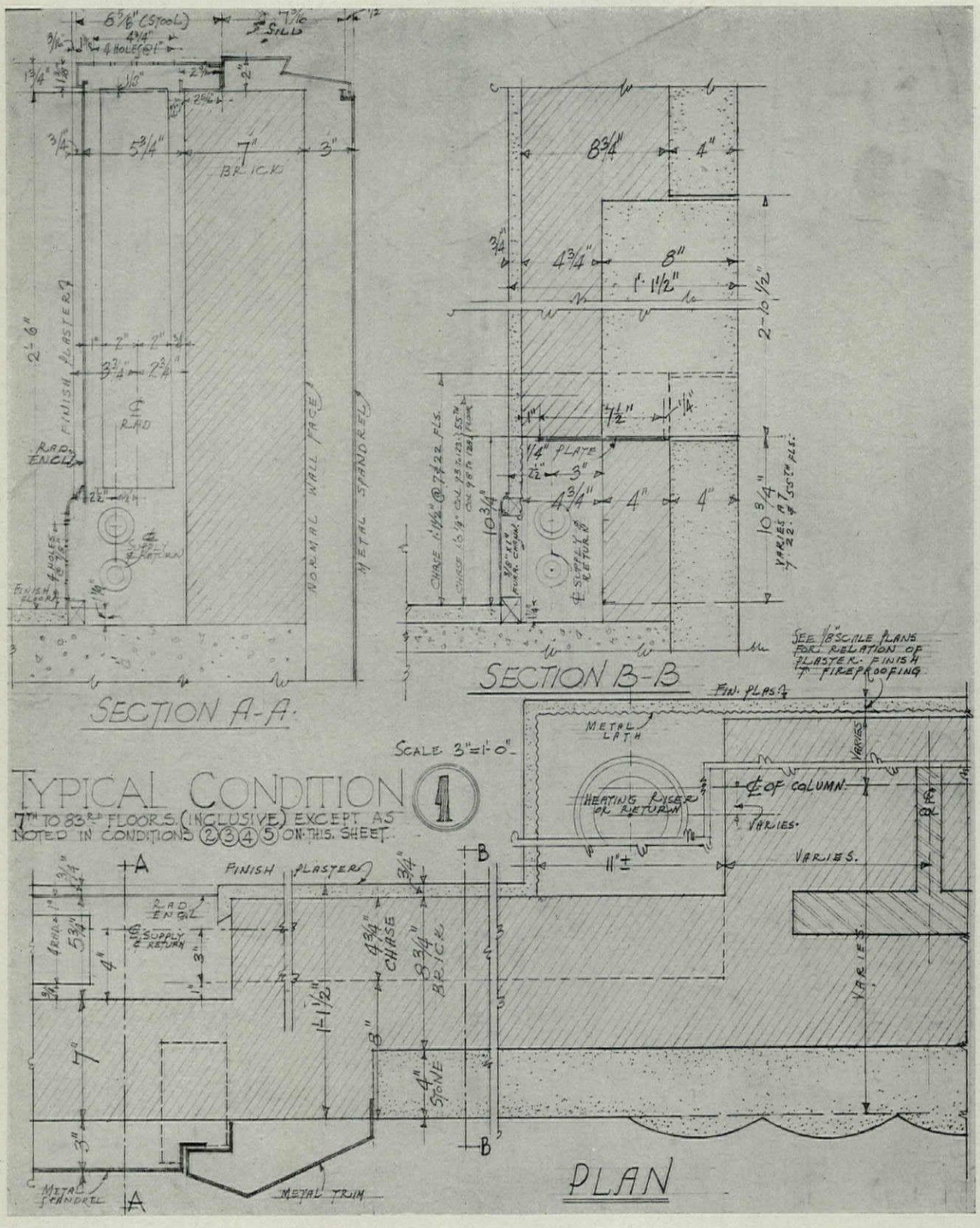


DETAILS OF CONSTRUCTION, EMPIRE STATE BUILDING, NEW YORK—SECTIONS SHOWING METAL SPANDRELS

SHREVE, LAMB, AND HARMON, ARCHITECTS



EMPIRE STATE BUILDING, NEW YORK—TYPICAL SPANDREL SHOWING RADIATORS

SHREVE, LAMB, AND HARMON, ARCHITECTS

THE SPECIFICATION DESK

Whys and Wherefores of the Specification

9—Carpentry, 2

By Philip G. Knobloch

Wall Sheathing

Wall Sheathing shall consist of materials as specified. Where wood sheathing is specified, the boards shall be dressed to an even thickness, not less than 25/32 inch thick, laid diagonally with close joints and nailed at every bearing with at least two nails. All joints, except where end-matched sheathing is used, shall be made over bearings.

Very often wall sheathing is laid horizontally. This is a less expensive method of laying sheathing but does not produce as rigid a bracing as does the diagonal. The diagonal method of sheathing is about twice as strong as the horizontal. Sheathing should not be wider than 8". Wider boards will warp or cup. A usual width is 6". (See Figure 5.)

Grounds

Permanent grounds shall be provided wherever required to afford proper nailing of all finished Carpentry for the securing of metal-covered wood or hollow metal trim.

All grounds shall be dressed to sizes required on details, and shall be secured in position in a manner absolutely rigid, straight, level, even, and plumb, so that the surfaces of the finished coat of plastering shall be flush with the face or edge of all grounds.

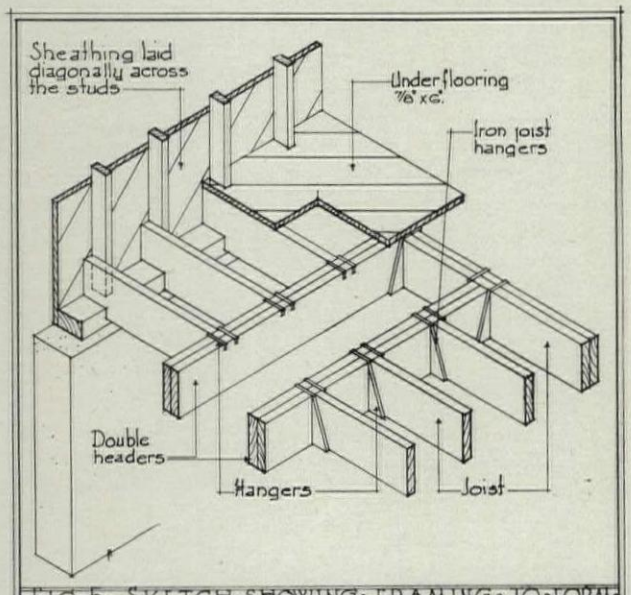


FIG. 5. SKETCH SHOWING FRAMING TO FORM AN OPENING IN THE FLOOR FOR STAIRS.

Grounds generally shall be 5/8" x 2" in size, where same are applied to block work, and 3/4" x 2" where applied to lath work. Grounds shall be in as many lines as required to set trim properly.

Nailing Strips or Blocking

Bolt 2" x 6" planks to bottom flanges of all beams where indicated to provide base for hanging partition hardware. 5/8" holes will be punched in beams' flanges under another contract. (See Figure 6.)

In Figure 6, No. 1, is shown method of detail through the head of a sliding door partition. The hardware for this partition is secured to the continuous blocking which in turn has been bolted to the steel. On the steel drawing, the particular I beam was noted to have 5/8" diameter holes punched through the bottom flange, staggered 2'0" o.c. which provided a method of fastening the blocking.

Figure 6, No. 2, shows the nailer strip on top of the beam now acting as a nailing base for a plank floor or wood joists. This time the holes have been punched through the top flange for the bolts, to fasten the nailer to the steel beam. Care must be taken that details such as these are covered either in the specifications or on the drawings or both. Drilling holes for bolting in the field is very much more expensive than shop punching.

Floor Sleepers

Where sleepers are called for on the plans they shall be 2" x 4" Y. P. scantlings secured to the floor construction by metal clips or the wire supplied and installed by this contractor. (See Figure 7.) *Unless otherwise noted on plans they shall be set at sixteen (16") centers except where special conditions require closer spacing. They shall be carefully leveled and blocked, special attention being paid to see that there will be no sagging at ends or anywhere throughout their length. Where underfloor is specified to be laid diagonally, header shall be installed where necessary to provide a continuous bearing. One line of sleepers shall be set around wall to form base for flooring ends.*

Form transverse runs, where directed, to accommodate pockets for electric conduits, steam piping, plumbing, and other service piping.

The use of cinder fill between sleepers is optional unless required by local ordinances. Sleepers may be held in place with cinder fill. The sleeper is beveled, the wide face laid on the concrete flooring to form a key for the cinders to hold the sleeper in place. Sleepers buried in cinder fill should be coated with water-resisting material such as creosote, tar, or penetrating oil to prevent dry rot from dampness. (See Figure 8, on page 559.)

The patented anchor clips for sleepers we believe are

preferable. They are spaced 16" o.c. and set in alignment after the concrete base has been screeded or leveled off and still soft enough to insert the clips. After the concrete has set the upper part of the clip or tab is raised to a vertical position and the sleeper inserted. The anchor clips are secured to the sleeper with nails through holes in the tabs making a rigid and strong anchorage. All the leveling is accomplished while installing the sleeper. (See Fig. 7.)

The anchor clip method is preferable to the cinder fill method, for it provides an air space that prevents rotting of the sleepers and underfloor. If cinder fill is used, it must be absolutely dry before the subfloor is installed. If the fill is damp, the sleeper and subfloor will rot quickly.

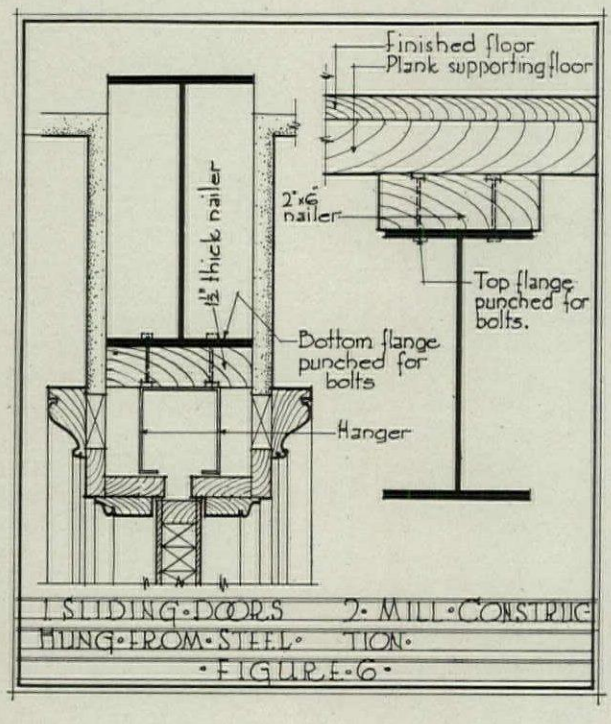
UNDERFLOORING

Underflooring shall consist of square edged or tongued and grooved boards 7/8" x 6" hemlock dressed to an even thickness face nailed with at least 2 nails at each bearing.

Unless otherwise specified, underflooring shall be laid at right angles to joists or sleepers. End joints, except where end-matched boards are used, shall be made over bearings. Joints between boards shall be open maximum of 1/8".

The under or subfloor is usually placed soon after the joists or sleepers have been installed. Therefore it is exposed to the weather and wear, practically throughout the job. (See Figures 5 and 7 for subfloor.) This will cause the floor to swell and expand, therefore it is desirable to provide for this condition. By laying the boards about 1/8" apart and nailing them well, warping and cupping will be held to a minimum and will cause no concern.

Where subfloors abut masonry walls, it is well to have a clearance of 1/2" between the wall and floor. This space provides space for possible swelling from water or dampness. A tightly laid subfloor will expand sufficiently to push out a newly laid masonry wall. We have had this experience on a job where the contractor had been cautioned and then considered the advice an unimportant detail. Had the wall set up sufficiently hard to withstand this expansion pressure then the subfloor itself would have buckled seriously. In either case, it required replacements at this contractor's expense. To the uninitiated, the power developed by this expansion would be indeed surprising.



1. SLIDING DOORS HUNG FROM STEEL
2. MILL CONSTRUCTION

FIGURE 6

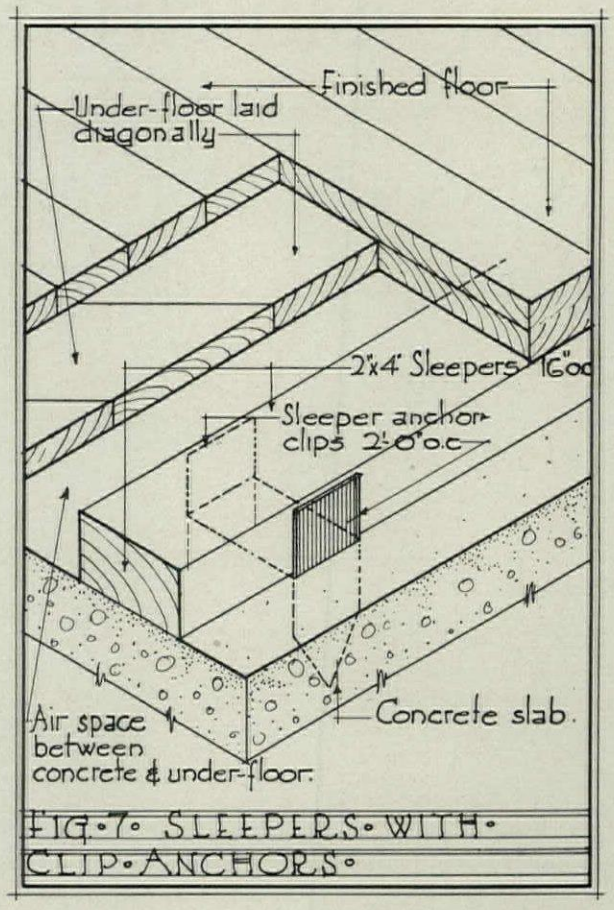


FIG. 7. SLEEPERS WITH CLIP ANCHORS.

Wood furring shall consist of 3/4" x 2" spruce or other soft wood, dressed to an even thickness, spaced twelve inches (12") o.c.

Where wood furring is specified to be applied to masonry surfaces, a secure nailing shall be provided by drilling and plugging, except where metal nailing plugs are specified.

Where metal nailing plugs are specified, they shall be furnished by this Contractor before masonry is built and will be built in by the Contractor for Masonry at this Contractor's direction.

Where wood furring is to be secured to wood framing, it shall be firmly nailed at every bearing.

All ceilings shall be furred with 3/4" x 2" spruce furring 12 o.c. to form base for the lath. (See Figure 9.)

The custom of furring exterior walls is sound and good practice. Where an asphalt preparation is sprayed under pressure on exterior walls with a final spraying of fine grit to form a plaster bond the necessity of furring is eliminated. This does not include any dampproofing paints or preparations that are applied with a brush. If these are used, it should be in conjunction with the furring. Furring is primarily an effort to create an air space between the exterior masonry wall and the plaster, and to prevent any dampness or water in the wall from getting at the plaster. No matter how well a wall may be built, it will absorb a certain amount of water, which will affect any finish applied directly to the wall without any protection in between. The practice of plastering directly to an untreated exterior wall is bad. It may succeed at times but in the majority of instances water trouble results. The furring is placed against the wall and fastened to either lath strips or clips previously built into the wall for this specific purpose. The lath and plaster is placed on the furring. This space protects the lath and plaster. The omission of

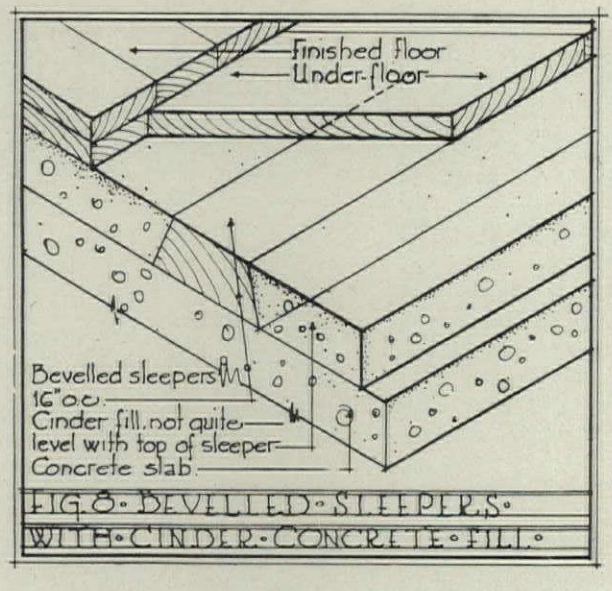


FIG. 8. BEVELLED SLEEPERS WITH CINDER CONCRETE FILL.

furring affects a small saving in money for the time being, but will be the cause of added expense and trouble later, when because of wet walls, the plaster falls away and the costly finishes such as wallpaper, paint, etc., are ruined.

BUCKS

Where wood bucks are called for, they shall be of the plain type of materials and sizes as shown on drawings. Legs shall be dadoed into heads and heads pointed at both ends. Where rebated bucks are specified, they shall be the full width of the partition plus the thickness of plaster on each side and shall be rebated ½" to receive partition blocks.

Bucks shall foot upon the floor arches or on top of concrete fill, as may be necessary, but shall be of sufficient length to permit either form of construction and shall have continuous footing piece ⅞" thick by the width of the buck. All bucks shall extend in one piece, the full height of the openings, and shall be provided with No. 16-gauge galvanized iron crimped anchors, 1½" wide, at least three to each jamb.

Bucks shall be accurately set, plumb, and true and properly stayed until built in.

FORMS

Concrete shall be placed in T. & G. wood forms (furnished, set and removed by this Contractor). The forms shall be substantial, unyielding, and so constructed that the concrete will conform to the designed dimensions and contours, and shall also be tight to prevent mortar leakage.

The forms for walls and floors shall be of sufficient strength and rigidity to prevent spreading and the uprights shall be held together by heavy galvanized wire, which shall be clipped at the wall line at completion. Forms for walls and floors shall not be removed for at least five (5) days. (See Figure 10.)

Forms were specified under the concrete division for the purpose of advising that contractor that the Carpenter would furnish, erect and remove the forms. This cross specifying prevents any duplication of costs in the bids.

The forms must be built of tongued and grooved boards, substantially erected and sufficiently tight to prevent the leakage of water and consequent loss of cement. The form must be strongly braced and rigid so as to maintain its position and shape and prevent spreading while the concrete is being placed. Liberal use of heavy cross wiring from the upright supports is specified. After the forms are removed these wires are clipped off. We permit form lumber to be used again for subfloors if the boards are in good condition and reasonably clean.

The forms must be continuous for the average small job and not built in sections, poured, and then removed and replaced further along the wall. This is poor practice and slow erection. Neither should permission be granted to pour a wall using the earth bank as one side of the form. (See Figure 11.) This practice produces poor and bad concrete walls. Excessive seepage of water into the earth bank carries away the cement particles and weakens the concrete by changing the proportion of cement. This practice is strongly condemned and under no circumstances should it be permitted.

CENTERS

Build all centers for Mason and Stone Work Contractors as required for their work.

SCAFFOLDS

This Contractor shall furnish, build, and remove all outside scaffold for the mason and stone contractors. The stone shall be laid from an outside scaffold; the backing up from an inside scaffold furnished, erected and removed by the Mason Contractor. The changing of scaffold planks shall be done by the various contractors using the scaffold. This Contractor to furnish scaffold planks.

The scaffolds shall be built in a strong and substantial manner sufficient to take safely the loads imposed on them and shall not be built less than the following standard: The uprights of scaffolds shall be 4" x 4" spruce (no other wood). The uprights shall be spaced not to exceed 6'0" apart and ledger boards and planking shall be 2" stock (not less than 2" x 6"). The scaffolds shall be diagonally braced and tied into building at proper intervals.

If local ordinances govern the sizes of scaffold members they are to be followed.

Under the Concrete Division that contractor was advised that the scaffold would be furnished and erected under this Division. This definitely establishes responsibility for the work and banishes all doubt beyond question. Each contractor using the scaffold is responsible for the changing of the plank to suit his needs. The lumber from the scaffold may be used in the building if it is in a satisfactory condition. Runways necessary for the masons and plasterers are not included in scaffolding and must be furnished by the respective trades using them.

RUNWAYS AND SCAFFOLDING

Required for pouring concrete shall be furnished and placed by Concrete Contractor.

DOOR ENCLOSURES

All exterior door openings shall be closed with substantial ⅞" board enclosures fitted with battened doors hung

(Continued on page 62, Advertising Section)

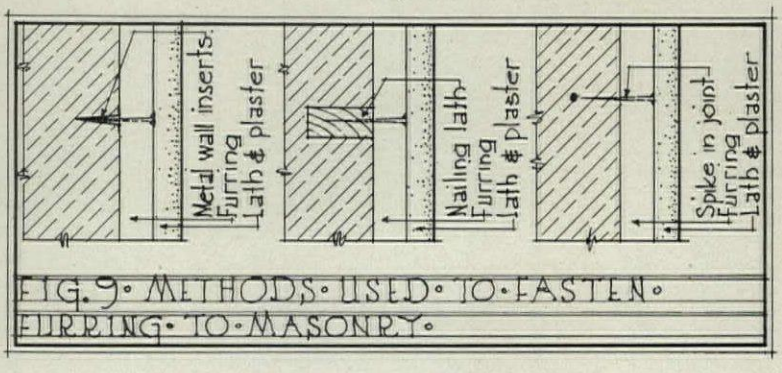


FIG. 9. METHODS USED TO FASTEN FURRING TO MASONRY.

SERVICE DEPARTMENTS

THE MART. In this department we will print, free of charge, notices from readers (dealers excepted) having for sale, or desiring to purchase books, drawing instruments, and other property pertaining directly to the profession or business in which most of us are engaged. Such notices will be inserted in one issue only, but there is no limit to the number of different notices pertaining to different things which any subscriber may insert.

PERSONAL NOTICES. Announcements concerning the opening of new offices for the practice of architecture, changes in architectural firms, changes of address and items of personal interest will be printed free of charge.

FREE EMPLOYMENT SERVICE. In this department we shall continue to print, free of charge, notices from architects or others requiring designers, draftsmen, specification writers, or superintendents, as well as from those seeking similar positions. Such notices will also be posted on the job bulletin board at our main office, which is accessible to all.

SPECIAL NOTICE TO ARCHITECTS LOCATED OUTSIDE OF THE UNITED STATES: Should you be interested in any building material or equipment manufactured in America, we will gladly procure and send, without charge, any information you may desire concerning it.

Notices submitted for publication in these Service Departments must reach us before the fifth of each month if they are to be inserted in the next issue. Address all communications to 419 Fourth Avenue, New York, N. Y.

THE MART

Clarence A. Tantau, 210 Post Street, San Francisco, Calif., would like to obtain the following copies of the *White Pine Series of Architectural Monographs:* Vol. II, Nos. 1, 3, 4, and 6; Vol. III, Nos. 1 and 4.

John W. Knobel, c/o Delano & Aldrich, 126 East 38th Street, New York, would like to have the following copies of the *White Pine Series of Architectural Monographs:* Vol. II, Nos. 1, 3, 4, and 6; Vol. III, Nos. 1 and 4.

Raymond Hill Wilcox, 807 Fox Bldg., Detroit, Michigan, is anxious to procure the following copies of *Landscape Architecture:* October, 1910; April, 1915; January and October, 1917.

R. F. Jackson, 9 Cornhill, Boston, Mass., has for sale copies of original new matter on *Perspective.* Sets equal in size to 24 sheets of text and plates suitable for filing, colored, $2.00; single sheets, 20c.; 4 different sheets (text or drawings), 50c. Three methods—direct, semi-direct, and indirect. Progressive steps, easy to understand.

George A. Hegewald, 450 Grant Avenue, Brooklyn, N. Y., has the following copies of PENCIL POINTS for sale: December, 1928; 1929 and 1930, complete. $3.00 for the lot.

Office to sublet to architect or engineer: Light private office 10′ by 16′, furnished or unfurnished with telephone and stenographic services. $100.00 per month. Thompson & Churchill, 19 West 44th Street, New York. Phone, VAnderbilt 3-2350.

Office space to rent to another architect. $50.00 per month with telephone and stenographic services. E. Washburn, 101 Park Avenue, New York.

Space available now, suitable for architect, in architects' office, with use of reception room and service. Inquire Room 1018, 247 Park Avenue, New York. Telephone, WIckersham 2-0569.

Stanley Grand, 1436 Ocean Ave., Brooklyn, N. Y., has the following copies of PENCIL POINTS for sale: August, 1920; April and December, 1921; January, March (2 copies), April and October, 1922. Also a few recent 1930-1931 issues.

Mr. Herzog, 6 East 45th Street, New York, wishes to purchase an architect's drawing table (or board) about six feet long, and a T-square. Telephone, VAnderbilt 3-2140.

Leonard C. Gordon, 74 Ward Street, Norwalk, Conn., has all issues of PENCIL POINTS from August, 1928, to present date, for sale wholly or in part, or will exchange for instruction books on art or lettering.

PERSONALS

GORDON F. STREET, ARCHITECT, has opened an office for the practice of architecture at 127 East Water Street, Santa Fé, New Mexico.

RAYMOND HOOD, GODLEY & FOUILHOUX, ARCHITECTS, have dissolved their partnership. Raymond M. Hood and J. Andre Fouilhoux will continue the practice of architecture under the name of Hood & Fouilhoux, at the same address, 40 West 40th Street, New York.

JOHN P. BROWN, ARCHITECT, has opened an office for the practice of architecture at 33 Pine Street, Exeter, N. H.

EICKENROHT & COCKE, ARCHITECTS, San Antonio, Texas, have dissolved partnership. Bartlett Cocke continues the practice of architecture at 615 Maverick Building.

RAYMOND HILL WILCOX, LANDSCAPE ARCHITECT, formerly of Pinner & Wilcox, is now practicing at 807 Fox Building, Detroit, Michigan.

P. L. DRAGON AND C. R. SCHMIDTS, ARCHITECTS, have opened offices for the practice of architecture in the Mercantile Bank Building, Berkeley, Calif.

JOHN LOUIS WILSON, ARCHITECT, has opened an office for the practice of architecture at 261 West 125th Street, New York.

JULES F. REITHER, ARCHITECT, has opened an office for the practice of architecture at 628 Independence Street, Cape Girardeau, Mo.

HENRY & MURPHY, ARCHITECTS, have moved their offices from the Second National Bank Bldg. to 247 East Exchange Street, Akron, Ohio.

WILLIAM H. REID, JR., has opened an office for the general practice of architecture at 1106 Union & Peoples National Bank Bldg., Jackson, Michigan.

CLARKSON & WRIGHT, ARCHITECTS, have opened an office for the practice of architecture, in Room 20, 42 Weybosset Street, Providence, R. I.

H. I. OSER AND J. LEWIS, ARCHITECTS AND ENGINEERS, have moved their offices from 1440 Broadway to 110 West 40th Street, New York.

E. C. LANDBERG, REGISTERED ARCHITECT, has consolidated his Newport, Kentucky, office with that in Cincinnati, Ohio. The new address is 114 Garfield Place, Cincinnati.

FRED H. ELSWICK, ARCHITECT, has moved his office from the Starks Building to 2128 Speed Avenue, Louisville, Ky.

EMPLOYMENT SERVICE ITEMS WILL BE FOUND ON PAGES 66 AND 68, ADVERTISING SECTION

WHYS AND WHEREFORES OF THE SPECIFICATION

(Continued from page 559, Editorial Section)

on strap hinges and secured by padlocks. Each door shall bear a wood sign with the words "Danger—No Admittance" in black letters on white ground.

PROTECTION OF STONE

This Contractor shall erect the necessary protection for sills and other projecting pieces of Stone. No lumber or any other material shall be used which would in any way stain or deface the Stone work.

All projecting courses such as belt courses, sills for doors and windows, bases, steps, cups, etc., located where the stone is liable to damage, should be protected with wood covering. This is called boxing. The wood for this protecting covering should be clean, strong pine wood boxing so that there is no possibility of staining or soiling the stone. While it may seem that this protection should be handled by the stone contractor, it is a simpler matter to have it included in this Division, inasmuch as there is not a great amount of stone on the job.

MATERIALS

Materials for finished carpentry, which includes interior and exterior woodwork, shall be of the species and dimensions specified or indicated on the Contract drawings and shall conform to the following requirements:

Wood throughout to be best grade red oak, vertical grain, except wood paneling around First Floor of Assembly Room, which shall be quartered oak sawed veneering 1/4" thick with small flakes. This panel to be veneered on back with a balancing veneering of any suitable veneer. Paneling to be 1-3/8" total thickness, including core.

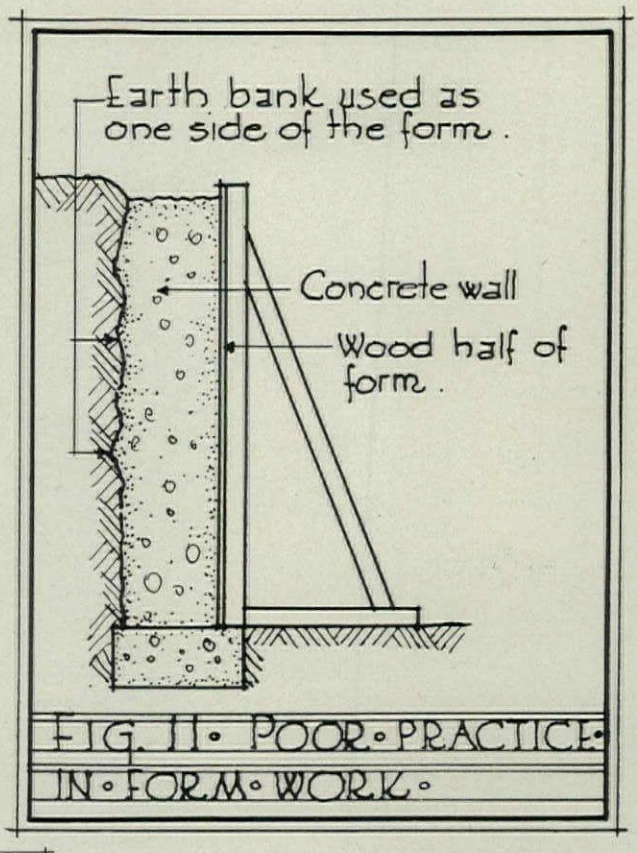


FIG. 11. POOR PRACTICE IN FORM WORK.

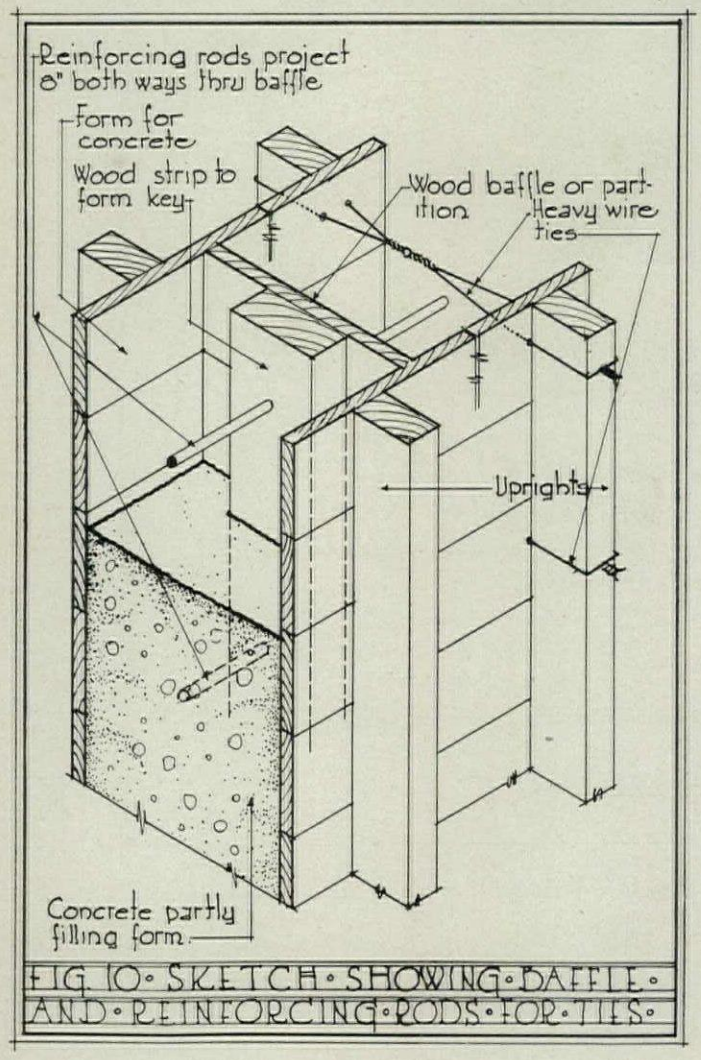


FIG. 10. SKETCH SHOWING BAFFLE AND REINFORCING RODS FOR TIES.

Material for natural, stained, varnished, lacquered or waxed finish shall be free from knots, shakes, sap, stain, worm holes or other defects impairing either durability or appearance.

Materials having marked difference in color shall be selected to obtain uniform color.

Where vertical grain is specified, the material shall be free from coarse pores.

Where panels or other portions of the work are specified to be selected for figure and grain, the material shall be carefully matched for figure and color.

This building is to be of oak trim throughout. For other wood desired, include fully the kind and grade required.

FINISHED CARPENTRY

In general, all finished carpentry shall be finished and assembled at the mill, as far as practicable, and delivered at the building ready to set in place. The material shall be worked in the best manner known to the trade; mortised, tenoned, doweled, blocked and glued together so as to avoid the use of nails as much as possible; mouldings cleanly cut, sharply defined and mitres accurately made. Plain butt joints without an approved device for preventing separation at joints will not be accepted. Where nails and screws are necessary they shall be concealed. All surfaces shall have a smooth machine finish.

(This discussion of Finished Carpentry specifications will be continued in the August issue.)

Publications on Materials & Equipment

Of Interest to Architects, Draftsmen 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.

A Portfolio on Modern Window Shading.—A.I.A. File No. 28-e. New publication with descriptive and technical information on the subject of shading for all types of windows. Specification data, drawings, illustrations. Samples of Tontine shade cloth are attached. 44 pp. Standard filing size. E. I. duPont de Nemours & Co., Inc., Fabrikoid Division, Newburgh, N. Y.

Carved Mouldings for Modern Interiors.—A.I.A. File No. 19-e-3. Illustrated catalog showing numerous designs of carved wood architectural mouldings for interiors. Drawings, price list. 10 pp. 7¾ x 10¾. Waddell Manufacturing Co., 1125 Taylor Ave., N. W., Grand Rapids, Mich.

Johns-Manville Insulating Board.—A.I.A. File No. 37-a-1. New monograph dealing with this type of insulating board, suitable for sheathing, interior finish, plaster base and roof insulation. Application details, descriptive and complete specification data. 12 pp. 8½ x 11. Johns-Manville Corp., 292 Madison Ave., New York, N. Y.

U. S. Ventilating Registers and Grilles.—A.I.A. File No. 30-e. Catalog No. 22 lists and illustrates a wide range of ventilating registers, grilles of perforated steel, brass, and bronze, wire screens and guards, lock type registers and chain operated ventilating registers. Dimension tables, specification data, etc. 32 pp. 8½ x 11. United States Register Co., Battle Creek, Mich.

Hydrogen Sulfide Generator.—Bulletin P illustrates and describes this new type of acid-proof chemical stoneware equipment especially adaptable for use in schools, colleges and industrial plants. 8½ x 11. General Ceramics Co., 71 W. 35th St., New York, N. Y.

Published by the same firm, "General Ceramics Improved Suction Filter." Bulletin T supplement covers a new type of suction filter for filtering corrosive materials under vacuum. 8½ x 11.

Conkling-Armstrong Terra Cotta.—A.I.A. File No. 9. Attractive looseleaf brochure with series of photographs and color plates showing examples of different types of buildings in which this kind of terra cotta in standard, mottled or polychrome finishes was used. Included is color chart showing a variety of pulsichrome finishes, also typical sections of terra cotta blocks for corridors, wainscoting, partitions, interior facing, etc. 28 pp. 8½ x 11. Conkling-Armstrong Terra Cotta Co., 1600 Arch St., Philadelphia, Pa.

Bryant Duplex Receptacles.—A.I.A. File No. 31-c-72. Bulletin No. XYR531 describes duplex receptacles, each outlet of which can be wired independently. Wiring diagrams and application illustrations. 4 pp. 8½ x 11. The Bryant Electric Co., Bridgeport, Conn.

Correct Woodwork for English and Norman French Homes.—A.I.A. File No. 19-e. Handsome brochure discussing the characteristics of English and Norman French home architecture and woodwork and illustrating authentic reproductions of a complete assortment of exterior and interior woodwork to meet the requirements of these forms of architecture. 28 pp. 8½ x 11. Morgan Woodwork Organization, 2287 Blue Island Ave., Chicago, Ill.

The Aero Convector.—Illustrated folder announcing and describing the Aero convector, a new concealed cast iron heating unit designed to heat by convection, sized to fit in standard walls and for use with steam, vapor and hot water systems. Tables of sizes and ratings, drawings, etc. 4 pp. 8½ x 11. National Radiator Corp., Johnston, Pa.

Steel Storage Equipment for the Modern School Shop.—A.I.A. File No. 28-a-1. New looseleaf publication presents many useful suggestions for solving school-shop storage problems and shows a wide range of equipment especially designed for the modern school shop. Specifications. 14 pp. 8½ x 11. Durabilt Steel Locker Co., Aurora, Ill.

Apex Perm-Brite.—Bulletin No. 1 describes the mechanical and physical properties of this new aluminum alloy suitable for spandrels and other architectural applications. 4 pp. 8½ x 11. Apex Smelting Co., 2554 Fillmore St., Chicago, Ill.

Kane All Metal Lift-Fold Screens.—A.I.A. File No. 35-p-1. Standard filing size folder with descriptive data, specifications and detail drawings showing the application of this kind of screen to various types of standard windows. Kane Manufacturing Co., Kane, Pa.

Southern Oak Flooring Industries Research Data Sheets for Architects.—Data sheet No. 22, under the title of Architectural Style-Schedule, shows how to specify oak flooring according to style of the building. Southern Oak Flooring Industries, Boyle Bldg., Little Rock, Ark.

Published by the same firm, "Oak Flooring Quality-Schedule." Data sheet No. 23 shows how to specify this type of flooring for various classes of buildings.

"Oak Flooring Work Sheet." Data sheet No. 24 contains precise specifications for laying, nailing and sanding or scraping.

"New Finishes for Oak Flooring." Data sheet No. 25 contains specifications for applying modern durable finishes. Southern Oak Flooring Industries.

Fenestra Casements with Built-In Windguards.—Illustrated folder setting forth the advantages of this new casement window equipped with built-in windguard at the sill. Detroit Steel Products Co., 2250 East Grand Boulevard, Detroit, Mich.

Published by the same firm, "Steel Curbing." Descriptive data folder with installation details devoted to this new landscaping material for use in making flower beds, grass plots, gravel walks, drives, courts, gardens, etc.

Protection for Wood Against Rot and Wood-Eating Insects.—A.I.A. File No. 19-a-31 and 34. New brochure presents a technical report giving known facts about Bruce preservatives and the Bruce preserving process. Included is a discussion of the fundamental and general characteristics of the various formulations accompanied by illustrations and schedule of recommended uses. 16 pp. 8½ x 11. E. L. Bruce Co., Memphis, Tenn.

Now—Sinks of Greater Usefulness.—Illustrated folder announcing and describing the features of two new designs of kitchen sinks equipped with duostrainers. Kohler Co., Kohler, Wis.

Trane Modern Heating.—Valuable reference manual for architects, specification writers and heating engineers, consisting of binder with collection of bulletins covering completely Trane concealed heating, unit heaters, blast heating and drying, heating specialties and pumps. Descriptive and engineering data, typical installations, roughing-in dimensions, capacity tables, etc. Standard filing size. The Trane Co., LaCrosse, Wis.

Calibron Perspective Paper.—Illustrated folder presenting instructions for using Calibron perspective paper type 1, together with a brief explanation of the basic principles of perspective. 4 pp. Calibron Products, Inc., 380 Main St., East Orange, N. J.

Samson Columns and Porch Work.—A.I.A. File No. 19-e-8. Attractively illustrated brochure covering this line of wooden columns and porch work suitable for homes, apartment houses and public buildings. Construction data, sizes, specifications, etc. 20 pp. 8½ x 11. Washington Manufacturing Co., Tacoma, Wash.

Piping Continuity.—Folder giving detailed information, sizes and specifications covering Weldells, a new line of welding elbows. 4 pp. 8½ x 11. The Locomotive Terminal Improvement Co., Railway Exchange, Chicago, Ill.

Carrier B-K Cold Diffusing System.—A.I.A. File No. 32. Bulletin No. 510 deals with the subject of cold diffusion, a unit evaporation system which eliminates bunker and wall coils and presents a new refrigeration application. Profusely illustrated. 16 pp. 8½ x 11. Brunswick-Kroeschell Co., New Brunswick, N. J.

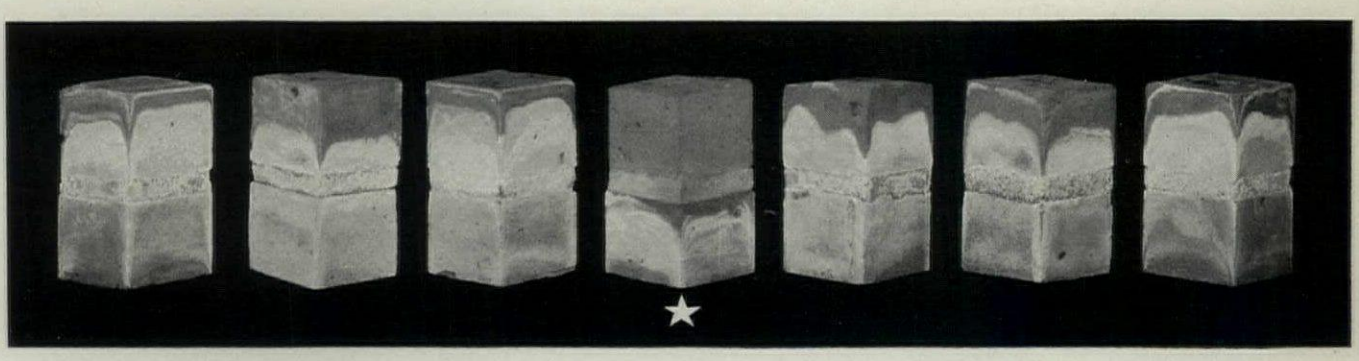
Sheet Iron—A Primer.—Fourth edition of this publication on the subject of sheet iron has been revised to take account of changes in manufacturing methods in sheet iron production, as well as to show recent progress in the efforts of science to make sheet iron more durable. 64 pp. 5½ x 7¾. Republic Steel Corporation, Youngstown, Ohio.

Medusa Stoneset.—A.I.A. File No. 3-a-2. Descriptive and specification data folder announcing this recently developed non-staining waterproofed mortar cement for the setting, pargeting and pointing of cut stone. 4 pp. 8½ x 11. Medusa Portland Cement Co., 1002 Engineers Bldg., Cleveland, Ohio.

Marsh Lanterns.—Filing folder with collection of plates showing numerous designs of oxidized brass lanterns. Descriptive data and dimensions. 8½ x 11. James R. Marsh & Co., Essex Fells, N. J.

(Continued on page 72, Advertising Section)

This TEST



HAS THE ENTIRE BUILDING FRATERNITY TALKING *about*—

CARNEY CEMENT MORTAR!

FOR two solid years the laboratories of the Carney Cement Company were engaged in the difficult task of finding the answer to the control of efflorescence and water absorption through mortar joints. The test above illustrates how completely these enemies of perfect masonry have been mastered.

The specimen laid up in New Carney Cement, which is marked by the star, together with six specimens of other manufacturers were made. The mortar for all was mixed, one part cement to three parts sand by volume. The same quality bricks were used, in all cases. The sand and water were identical and all specimens were exactly the same age. They were immersed in sodium sulphate solution (a common cause of efflorescence) to a depth of one-half inch. They all stood in this solution for 48 hours. In every case excepting in the Carney specimen, the sodium sulphate solution was drawn up by capillary attraction through the mortar joints into the top bricks. In the Carney specimen, the action was fully checked at the joint—which emphatically demonstrates two things—the effective resistance of this new material to the spread of efflorescence and the complete water-tightness of Carney Cement.

Furthermore, the new Carney Cement has been thoroughly tested with mortar colors of all leading producers and found to carry any color perfectly. On the job the mortar is ready for use the moment it is mixed and possesses even better working qualities than the old material, which was regarded as the smoothest mortar on the market.

THE CARNEY CEMENT COMPANY

DISTRICT SALES OFFICES: CHICAGO CINCINNATI DETROIT ST. LOUIS MINNEAPOLIS

Mills: Mankato and Carney, Minn.

Cement Makers Since 1883

CARNEY CEMENT
for Brick and Tile Mortar

A Free Employment Service for Readers of Pencil Points

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

Position Wanted: Architectural draftsman thoroughly experienced in all phases of office routine, structural as well as architectural design, young man of good appearance and capable of high class business solicitations. Salary moderate. Would consider partnership. Box No. 700, care of PENCIL POINTS.

Position Wanted: Good draftsman, three and one-half years at New York University day school of architecture, four and a half years of actual experience; good in water colors and pencil sketching. Brooklyn or New York. Will also consider part time or home work. Box No. 701, care of PENCIL POINTS.

Position Wanted: In architect's office or with a building material manufacturer. Young man and a graduate of a vocational high school. Two years' experience as junior draftsman with prominent Southern firm of architects. Will take position anywhere. Box No. 702, care of PENCIL POINTS.

Position Wanted: Graduate architectural engineer available. Four years of varied experience in the following: architectural working drawings, architectural details, structural design and structural details.. Age 26. Married. Reasonable salary expected. East or Mid-West preferred. Box No. 703, care of PENCIL POINTS.

Position Wanted: Young woman wishes full or part time position with decorator in Los Angeles or vicinity. Has had practical experience in building and remodeling as well as university and art school training. References. Box No. 704, care of PENCIL POINTS.

Position Wanted: Specification writer, 20 years' experience. Last 12 years with designers and builders of bank buildings and commercial buildings. Previous work on apartment houses and other types of buildings. Charles L. Hartmann, 82 Wadsworth Terrace, New York, N. Y. Telephone, Washington Heights 7-0551.

Position Wanted: Junior architectural draftsman, age 16, willing to work for any amount. Thomas Setti, 37-39—95th Street, L. I., N. Y.

Position Wanted: Young man, 17, desires position as junior draftsman or tracer. Neat worker, two years' practical experience at a local High School, also one year American School. Can furnish good references. M. Striger, 74 Varet Street, Brooklyn, N. Y.

Position Wanted: Young man desires position as field representative for architect or owner. Five years' experience with a prominent New York builder. Best of references as to character and ability. Box No. 705, care of PENCIL POINTS.

Position Wanted: Graduate architectural engineer, registered architect in North Carolina, 8 years' architectural and construction experience. Salary about $60.00 per week. Box No. 706, care of PENCIL POINTS.

Position Wanted: Young man, 25, desires position as junior draftsman or tracer in architect's office, graduate of recognized southern architectural school. Three years' training in architecture at University of Penn. Has had some office experience. Will go anywhere but prefers southern or western states. Salary secondary. Can furnish good references and samples of work. Box No. 707, care of PENCIL POINTS.

Position Wanted: Architectural student would like position during July and August in office. Will have completed three and a half years of High School work by July. Has had over four years of carpentry and building experience. Can furnish best of references. Would like position in or near Philadelphia, Pa. Edward Moss, 1331 Bleigh Street, Philadelphia, Pa.

Position Wanted: Architectural draftsman of fourteen years' experience on working drawings for practically every type of building wants position of any duration, anywhere in U. S. at moderate salary. Thirty-eight years old, married. Excellent references. Last six years in Philadelphia. Frederick H. Stahl, 5225 North 5th Street, Philadelphia, Pa.

Position Wanted: Squad leader and draftsman with 19 years' versatile experience on all classes of work desires position with New York City architect. Last engaged for six years on $25,000,000 State Group of Building by well known architect. Nine years of training, Pratt Institute, Beaux Arts Institute of Design, Harvard Architectural School, travels abroad. Will also consider position with possibility of future partnership. Box No. 709, care of PENCIL POINTS.

Position Wanted: Young man, 20 years old, wishes position in architect's office. Successfully completed first year of architectural course at Newark Tech. One year's experience in drafting room. Box No. 708, care of PENCIL POINTS.

Position Wanted: As architectural draftsman. Have had 20 years' all-round experience in designing, detailing, working up drawings, etc. Can take a set of drawings and work them up from beginning to completion. Eastern or southern location preferred. Box No. 710, care of PENCIL POINTS.

Free Lance Work Wanted: By expert architectural draftsman. Box No. 711, care of PENCIL POINTS.

Position Wanted: Architectural designer, draftsman and supervisor, age 26, eight years' practical experience on fine residences, theatres, hospitals, hotels, schools, alterations, etc. Designing and carrying work through to completion, including scale and full size details, designing steel and reinforced concrete, making perspective renderings and supervising at job. Graduate of Texas Agricultural and Mechanical College. Location and salary secondary. Box No. 712, care of PENCIL POINTS.

Position Wanted: Young lady, M.I.T. graduate, with experience wishes position as draftsman. Good tracer, neat letterer, efficient and willing to adapt herself to any line of business. Box No. 713, care of PENCIL POINTS.

Position Wanted: Draftsman — designer — renderer — modern studies. Free lance or otherwise. Box No. 714, care of PENCIL POINTS.

Position Wanted: Draftsman, age 32, married, 15 years' experience, desires employment with reputable architect or architectural firm in New York. Formerly connected with Messrs. Voorhees, Gmelin and Walker, architects. Samples of work and recommendatons furnished if requested. Frank A. Riviello, 1575 Theiriot Avenue, New York, N. Y.

Position Wanted: Boy, 16, desires office boy's position in architect's office. Graduated from Indianapolis High School. Taking up architectural drafting. References. Eugene J. Grassie, 48 Wyckoff Ave., Brooklyn, N. Y.

Position Wanted: Secretary to architect or builder. Young lady, educated, executive ability, with tack and pleasing personality, ten years' experience in bookkeeping and stenography, can read plans and take off quantities for estimating, desires position. Goodwin, 1936 Loring Place, New York. N. Y.

Position Wanted: Young man, 17, graduating from High School, desires to enter architectural firm as office boy to work up. Has knowledge of architectural drawing. Edmund K. Pabrasska, 3812—6th Avenue, Kenosha, Wis.

Position Wanted: Young man, 17, with some knowledge of architectural drawing. Willing to work at anything. Salary no object. Michael Solto, 48 East 10th Street, New York, N. Y.

Position Wanted: Man identified with building for over twenty years during which time has acted as superintendent, written specifications, made quantity surveys, done estimating. Very excellent draftsman. Work has covered theatres, banks and schools. Had complete charge of the erection of the Benjamin Franklin Junior High School in Norwalk, Connecticut. Would like to connect with good architect or builder specializing in large country homes who is particular about having work executed in the best possible manner. Box No. 717, care of PENCIL POINTS.

Position Wanted: Middle-aged man wishes position in architect's office or with construction firm. Graduate of Mechanics Institute. Willing to start at low salary and able to do a variety of duties. Box No. 724, care of PENCIL POINTS.

Position Wanted: Designer-draftsman, thoroughly familiar with all styles and modern architecture. Sketching, designing, detailing, working drawings, perspectives and renderings in all mediums. Box No. 715, care of PENCIL POINTS.

Position Wanted: Architectural draftsman, 8 years' experience, planning, detailing, designing and rendering of apartments, residences, and country houses. Neat worker and capable of making working drawings from sketches to full size details. Box No. 716, care of PENCIL POINTS.

Position Wanted: Architectural tracer and junior draftsman, 19, desires permanent position in Chicago assuring opportunities for advancement. Salary secondary. Is neat, honest, ambitious and above the average in ability. Some experience on residences. Graduate of Chicago Technical College. Walter Wischstadt, Itasca, Ill.

A Free Employment Service for Readers of Pencil Points

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

Position Wanted: Registered architect, designer and draftsman, twenty years' practical experience on residential, commercial and public work. Can handle work from preliminary sketch to completion and take full charge of office. Also experienced in soliciting work and conferring with clients. Married. References. Box No. 719, care of PENCIL POINTS.

Position Wanted: Competent college trained architectural draftsman, six and one-half years' wide experience, 30 years old, married, desires permanent or temporary work in city or northern New Jersey. Able to design, detail full size and render in pencil, ink or wash. Box No. 720, care of PENCIL POINTS.

Position Wanted: Young man wishes to secure position in architect's office. Graduate of Mechanics Institute, two years' office experience. Good letterer and tracer, also experienced in apartment house layouts. Salary secondary. Lindsey S. Reed, Jr., 31-45—102nd Street, Corona, L. I., N. Y.

Position Wanted: Tracer, few years at College of the City of New York studying civil engineering, past few years student of the International Correspondence Schools in architecture. Desires permanent position with public utility in New York City or vicinity. Seven years' experience as draftsman and tracer. Age 30. Salary $180.00 per month. J. S. Levine, 2845 West 30th Street, Brooklyn, N. Y.

Position Wanted: Draftsman desires position with architect or construction concern in Greater New York or New Jersey. Five years' experience on residence and apartment house work. Augustus L. Oppel, Basking Ridge, N. J.

Wanted: Salesman, experienced in landscape contracting or nursery stock. An excellent opportunity for a man of character and ability to form a permanent and profitable connection. Give full information in your first letter. Box No. 721, care of PENCIL POINTS.

Free Lance Work Wanted: Eight years' experience—speed—accuracy—well recommended—creative ability. Max L. Mutchnik, 16 Third Street, Oceanside, N. Y.

Position Wanted: Engineer with 15 years' specialized building construction experience as structural engineer, architect's superintendent, estimator and contractor's manager on steel skeleton, reinforced concrete and heavy timber-framed industrial, commercial and monumental buildings. Seeks association with reputable architect. Licensed, graduate, C. E. M. A. S. C. E. American. Single. Age 35. Box No. 722, care of PENCIL POINTS.

Position Wanted: Man who has devoted his entire life to the construction industry including twelve years as architectural and mechanical draftsman, superintendent of construction and chief draftsman. Has sold building materials, estimated cut stone, etc. Forty-one years of age, married, Catholic and an A.I.A. member. Experience covers all class of buildings but mostly educational and ecclesiastical buildings. Willing to locate mostly anywhere. Box No. 723, care of PENCIL POINTS.

Free Lance Work Wanted: Architectural drafting and rendering done by practical draftsman in your office or mine. Call Longacre 5-3353 or write to J. Krendel, 110 West 40th Street, New York, N. Y.

Position Wanted: Architectural draftsman, 28 years of age, 11 years' experience on buildings of all types. Have worked for some of the most well known architects. Drawings and letters by appointment. Married. Salary open. Box No. 725, care of PENCIL POINTS.

Position Wanted: Architectural designer with extensive experience in prominent offices. Qualified by training and ability for composition in plan and elevation. Long familiar with the styles and their application to monumental, ecclesiastical, residential and commercial structures. Graduate of accredited school. Competent on working drawings, making and rendering perspectives and preliminary sketches. No preference in location. Box No. 726, care of PENCIL POINTS.

Position Wanted: Young man, Technical High School graduate, four years' attendance at Columbia University Extension classes (Architectural School). Employed three years in an engineering company's drafting room. Experienced tracer and detailer. Box No. 727, care of PENCIL POINTS.

Position Wanted: Draftsman, six years' training at Columbia University Extension. Five years' experience on country houses and commercial buildings. Salary $50.00. Box No. 728, care of PENCIL POINTS.

Position Wanted: Young man, 21, architectural student, draftsman, with 5 years' general architectural experience desires position in architect's or builder's office. Salary secondary. Howard E. Fay, 703 West 178th Street, New York, N. Y.

Position Wanted: Specification writer and superintendent. Man with twenty years' practical experience in architectural trade specification writing for all classes of construction, both private and Government, also building construction, supervision. Box No. 729, care of PENCIL POINTS.

Position Wanted: Supervisor, age 29, nine and one-half years' experience on residences, stores and apartments, ramp garages, office buildings, etc., both in drafting room and in field, with approximately three and one-half years in field. Registration in Ohio. Location immaterial. Salary $60.00 a week. Box No. 730, care of PENCIL POINTS.

Position Wanted: Young man wants a position as junior draftsman. Prefer architect's office. Willing to start as a blueprint tracer. Can also do pencil and ink drawing. Have completed one school. Will start night school. Aim is advancement. Harry Shapiro, 570 Gates Avenue, New York, N. Y.

Position Wanted: Draftsman, 9 years' general drafting experience. Capable making sketches, working drawings, scale and full size detailing, structural steel plans and details. Knowledge of plumbing, heating and electrical layouts. Checking all shop drawings, estimates and following of correspondence. Salary $75. per week. Stephen Bednar, 313 Munson Avenue, McKees Rocks, Pa. (Pittsburgh vicinity).

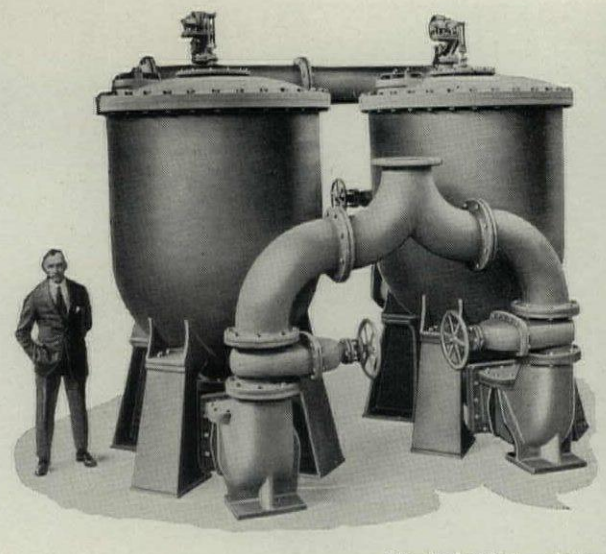
Position Wanted: Mr. Architect: Can you use in your organization an architectural draftsman whose training and experience qualifies him to take complete charge of an architectural office? Drafting, specification writing, superintending, checking, and concrete and steel designing. Adrian F. Scovil, 1483 Lee Place, Apt. 8, Detroit, Michigan.

Position Wanted: Architectural student, 18 years old, would like position with architect in Chicago. Have completed one-year course at Chicago Technical College, and also had two years at the Crane Technical High School. Neat letterer and tracer. Willing to start at the bottom. Carl Y. Falzone, 915 So. Winchester Ave., Chicago, Ill.

Position Wanted: What have you to offer a man who has had his own office and has east, west, south and north experience and can handle every position in either the office or field? Age 39. Married. Will go anywhere. Salary secondary. Box No. 731, care of PENCIL POINTS.

Position Wanted: Designer, draftsman, age 26, nine years' practical experience on fine residences, theatres, schools, hospitals, country clubs, alterations, etc. Experience has involved designing and carrying work through to completion, including working drawings, details, steel and reinforced concrete, perspective renderings and supervision. Graduated from Harvard Architectural School. Box No. 732, care of PENCIL POINTS.

Delineation: Architect specializes in finished renderings and rough sketches. Work includes exteriors, interiors, furnishings and landscape. Mediums: pencil, crayon, water color, tempera, colored pastels, charcoal, ink. Volunteer 5-2489.



The duplex Shone ejectors in the new Waldorf-Astoria have a capacity of 250 G. P. M. each. They are similar in type to those pictured above. Schultze & Weaver, Architects.

SHONE Ejectors in the Waldorf-Astoria Hotel

For twelve years before the old Waldorf Hotel received the first of its many distinguished guests, Shone sewage ejectors were laying the foundation for their present world-wide use.

For the new Waldorf-Astoria, where the traditional hospitality and luxury of this famous hostelry will be perpetuated, Shone ejectors have been selected to handle the sewage and drainage requirements.

In this case, as in others, the choice of Yeomans equipment was guided by their established record for dependability and long, low-cost service. Completely automatic and trouble-free, Shone sewage ejectors are a source of permanent satisfaction to the owner and a testimonial to the sound judgment of the architect and engineer.

Catalogs and detailed information on the money-saving advantages of Yeomans pumps and sewage ejectors will be gladly supplied on request. Write today; there is no obligation.

YEOMANS PUMPS · GIVE YEOMAN SERVICE ·

YEOMANS BROTHERS COMPANY
1448 Dayton Street, Chicago, Illinois

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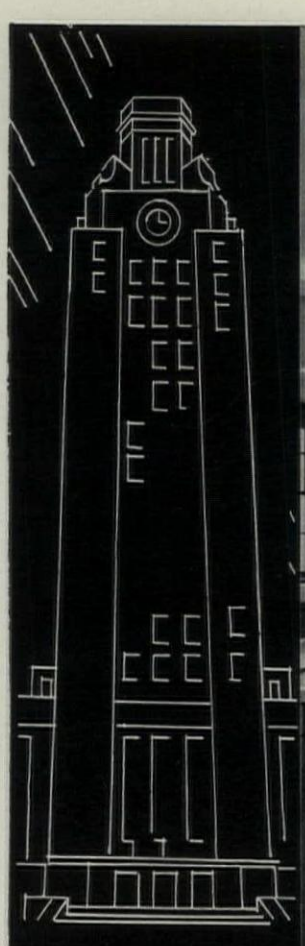


Floors in this splendid building installed by J. B. Van Sciver Co., Camden, N. J., General Contractor: F. W. Mark Construction Co.

Another public building goes Sealex

Now add to the long list the new Camden County Court House and Municipal Building, Camden, N. J., in which Edwards & Green, Architects, specified 144,000 square feet of Sealex Floors. This is one of several hundred city halls, libraries, hospitals, schools and gymnasiums in which Sealex Floors are rendering a public service.

Sealex Battleship Linoleum is the ideal heavy-duty floor for any institution. The "Battleship" in the name of this floor means that it conforms to rigid U. S. Government specifications. Where more decorative effects are in order, we recommend Sealex Treadlite Tile. The photograph above shows a typical installation of this material in the Register of Deeds Office at Camden.

In practically any city in the country we can put you in touch with firms that have the skill and experience to give you a top-notch installation of Sealex materials. Our floor contractors are exceptionally well equipped to handle large-scale installations.

When Sealex materials are installed by an Authorized Contractor of Bonded Floors, we back them with a Guaranty Bond, issued by U. S. Fidelity and Guaranty Co. Address inquiries to our Contract Department.

CONGOLEUM-NAIRN INC., KEARNY, N. J.

SEALEX
LINOLEUM FLOORS

PUBLICATIONS
OF INTEREST TO THE SPECIFICATION WRITER

(Continued from page 64, Advertising Section)

Yeomans Water Supply for Buildings.—A.I.A. File No. 29-d-5. Engineering data bulletin No. 1 contains useful information on the selection of water supply pumps for buildings and other related data on the subject. 4 pp. 8½ x 11. Yeomans Brothers Co., 1433 Dayton St., Chicago, Illinois.

Macoustic 47-W — A New Washable Acoustical Plaster.—A.I.A. File No. 39-b. Bulletin giving detailed information covering this new plastic acoustical material particularly adapted for use in hospitals, radio studios, offices, swimming pools, theatres, schools, etc. Specifications. 8 pp. 8½ x 11. Macoustic Engineering Co., Inc., Cleveland, Ohio.

TMB Acoustic Tile.—A.I.A. File No. 39. Sound correction Bulletin No. 2. Descriptive and specification data covering this type of acoustic tile for use in churches, schools, hospitals, gymnasiums and auditoriums. 4 pp. 8½ x 11. Thos. Moulding Acoustical Engineering Co., 165 W. Wacker Drive, Chicago, Ill.

Expansion Loops Made with Tube-Turns and Straight Pipe.—Bulletin 106 presents useful design data and chart offering a rapid and accurate calculation of expansion loops made up with Tube-Turns and straight runs of pipe. 4 pp. 8½ x 11. Tube-Turns, Inc., Shelby St. and Goss Ave., Louisville, Ky.

Prefinished Uplyco Flooring.—Useful document for architects and specification writers describing in detail the construction and advantages of prefinished plywood flooring suitable for homes, offices and wherever hardwood flooring can be used. Included are standard designs, specifications and data covering its use for parquetry, strip and plank floors. Tables of grades and sizes. 12 pp. 8½ x 11. United Plywood Sales Corp., Flooring Division, Portsmouth, Ohio.

Sturtevant Humidifilter—An Air Conditioning Unit.—Catalog 383 illustrates and describes in detail this new type of humidifier suitable for a wide range of industrial applications. Tabular matter, typical sections. 8 pp. 8½ x 11. B. F. Sturtevant Co., Hyde Park, Boston, Mass.

Published by the same firm, "Sturtevant Air Conditioning Units—Suspended Type." Bulletin No. 384 presents descriptive and engineering data covering the Sturtevant suspended type unit cooler and unit humidifier particularly applicable to printing, textile and other industrial plants. 6 pp. 8½ x 11.

Andersen Noiseless Sash Pulley.—A.I.A. File No. 27-a-1. Illustrated folder covering this type of sash pulley. Specifications and sizes. Andersen Foundry Co., Bayport, Minn.

Crampton-Farley Backwater Trap Floor Drains.—A.I.A. File No. 29-c-3. Detail sheet covering the Gateway open type floor drain equipped with submerged brass valves. 8½ x 11. Crampton-Farley Brass Co., Kansas City, Mo.

The Quiet May Automatic Oil Burner.—Attractive publication with color plates dealing with this type of oil burner shows graphically its installation and operation. 32 pp. 8½ x 11. May Oil Burner Corporation, Baltimore, Md.

Boca Pivoted Windows and Steel Doors.—A.I.A. File No. 16-e-1. Catalog M-31, just issued, presents complete information, specifications, details, etc., covering this line of steel center-pivoted windows and steel doors. 16 pp. 8½ x 11. The Bogert & Carlough Co., Paterson, N. J.

The Boiler-Burner Book.—Useful reference manual for architects and heating engineers announces and describes in detail a special line of boilers for oil burning. Complete engineering data and descriptions of various specialties are included in separate document accompanying manual. Standard filing size. The H. B. Smith Co., Westfield, Mass.

Cast Stone.—Attractive publication on the subject of cast stone contains a discussion of the characteristics and advantages of this material and an explanation of the various factors involved in its production. Included are illustrations of many interesting applications. 28 pp. Standard filing size. The Cast Stone Institute, 33 West Grand Ave., Chicago, Ill.

Published by the same firm, "Architectural Specification for Cast Stone." A.I.A. File No. 8-c. Document containing a complete architectural specification for cast stone. 8½ x 11. 12 pp.

Heat by Wire.—New illustrated publication giving a complete description of the advantages and the economic application of Hallmark electric heating. 16 pp. 8½ x 11. Hall Electric Heating Co., Inc., 1429 Walnut St., Philadelphia, Pa.

USS Stainless and Heat Resisting Steels.—A valuable new treatise for architects dealing with this comprehensive line of chromium alloy steels and chromium-nickel alloy steels suitable for a wide range of architectural applications. Included are discussions of the composition and physical properties, corrosion resistance data and recommended procedures for uses of each type of steel. Profusely illustrated. 36 pp. 8½ x 11. Subsidiary Manufacturing Companies of the United States Steel Corporation, Frick Bldg., Pittsburgh, Pa.

"PIPE PRESCRIPTION"

★ is practiced in these ★ beautiful Washington homes!

Wesley Heights residence of Senor Luis O. de Abelli, Washington, D.C. Erected by W. C. and A. N. Miller

WASHINGTON, the capital city, is famous for its beautiful homes. Among these is the recently completed residence of Senor Luis O. de Abelli, in Wesley Heights.

One of the distinguishing features of this architectural achievement—and 275 other high-class residences sponsored by W. C. and A. N. Miller—is "pipe prescription," designation of specific types of pipe to meet and solve specific pipe problems. In this particular instance Byers Genuine Wrought-Iron Pipe was a standard specification for hot and cold water lines.

Performance records of various pipe materials as observed by architects in various sections of the country are vitally important in the formulation of a "pipe prescription." Nothing can, or should, change an architect's experience; for he knows each pipe specification demands individual consideration. Architects themselves have established the wisdom of "pipe prescription."

"Pipe prescription" is the established practice of selecting a certain type of pipe for a certain type of service. Practical economy and other important features considered, there is no single kind of pipe material that will blanket a job. We do not even claim that Byers Genuine Wrought-Iron Pipe is ideal for all uses. What we do claim—and all claims for Byers Pipe are based on actual performance records—is that in the places where its superiority is based on use, there is no competitor in maximum service.

Since 1864, Byers has been the standard of wrought-iron quality. It is identified by a Spiral Stripe. As further assurance of the genuine, the name "Byers" is also imprinted in the metal. A. M. Byers Company, Pittsburgh, Pa. Established 1864.

BYERS GENUINE WROUGHT-IRON PIPE

AN INVESTMENT • NOT AN OUTLAY

THE LOS ANGELES BILTMORE

Architects—Schultze & Weaver; Engineer—H. G. Balcom; Contractor—Scofield Engineering & Construction Company . . . Addition to the Building: Architects—Schultze & Weaver; Engineer—Paul Jeffers; Contractor—Scofield Engineering & Construction Company.

FRAMEWORK OF BETHLEHEM SECTIONS

BETHLEHEM STEEL COMPANY
General Offices: Bethlehem, Pa.

District Offices: New York, Boston, Philadelphia, Baltimore, Washington, Atlanta, Pittsburgh, Buffalo, Cleveland, Cincinnati, Detroit, Chicago, St. Louis.

Pacific Coast Distributor: Pacific Coast Steel Corporation, San Francisco, Los Angeles, Seattle, Portland, Honolulu.

Export Distributor: Bethlehem Steel Export Corporation, 25 Broadway, New York City.

BETHLEHEM STEEL

BETHLEHEM

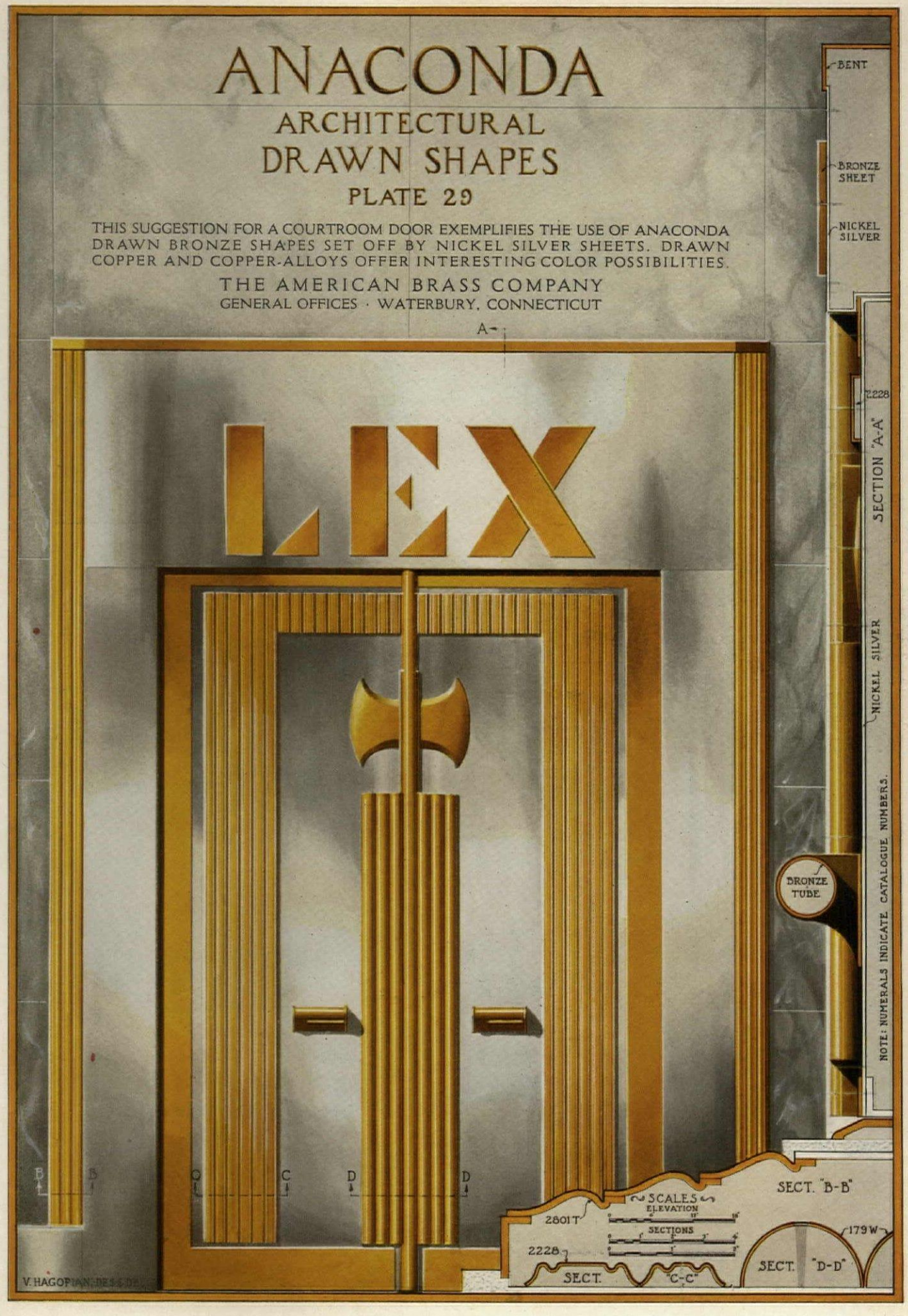
ANACONDA

ARCHITECTURAL DRAWN SHAPES

PLATE 29

THIS SUGGESTION FOR A COURTROOM DOOR EXEMPLIFIES THE USE OF ANACONDA DRAWN BRONZE SHAPES SET OFF BY NICKEL SILVER SHEETS. DRAWN COPPER AND COPPER-ALLOYS OFFER INTERESTING COLOR POSSIBILITIES.

THE AMERICAN BRASS COMPANY
GENERAL OFFICES · WATERBURY, CONNECTICUT



THE HERMAN NELSON CORPORATION

HERMAN NELSON *Invisible* RADIATOR

When you specify the Herman Nelson Invisible Radiator you are performing a two-fold service for your client.

You are assuring him, first, of a heating method in key with modern trends, because this compact heating unit fits within the wall—occupies no space in the room.

You are assuring him, second, of proper heating results because the Herman Nelson Invisible Radiator incorporates engineering principles proved correct by years of successful heating experience.

The Herman Nelson Invisible Radiator comes completely equipped with a sturdy, correctly designed steel case, graduating damper and choice of six authentic grilles. For larger and taller buildings, where access to control valves is required, a special removable panel is provided.

If you are planning any type of building that will have a steam, hot water, vapor or vacuum heating system, specify Herman Nelson Invisible Radiators for client satisfaction. Do you have our catalogue? A request will bring it to you.

The Herman Nelson Corporation are makers of the *Univent System of Ventilation*, the *Her-Nel-Co System of Ventilation*, the *Herman Nelson Invisible Radiator*, the *Herman Nelson hiJet Heater*, and other heating and ventilating equipment.

A HERMAN NELSON PRODUCT

Factory at Moline, Illinois · *Sales and Service Offices in all Principal Cities*

BELFAST, ME.	SCRANTON	GRAND RAPIDS	DES MOINES	MIAMI	SAN FRANCISCO
BOSTON	KINGSTON, PA.	SAGINAW, MICH.	MILWAUKEE	DALLAS	LOS ANGELES
SPRINGFIELD, MASS.	HARRISBURG	DETROIT	APPLETON, WIS.	OMAHA	VANCOUVER, B. C.
PROVIDENCE, R. I.	PITTSBURGH	CLEVELAND	MINNEAPOLIS	EMPORIA, KAN.	TORONTO, ONT.
HARTFORD, CONN.	JOHNSTOWN, PA.	COLUMBUS	DULUTH	KANSAS CITY	WINNIPEG, MAN.
NEW YORK CITY	ALLENTOWN, PA.	CINCINNATI	ST. LOUIS	DENVER	CALGARY, ALTA.
SYRACUSE	ERIE, PA.	TOLEDO	BIRMINGHAM	SALT LAKE CITY	LONDON
ALBANY	WHEELING, W. VA.	INDIANAPOLIS	NASHVILLE	BUTTE, MONT.	OSLO
ROCHESTER	WASHINGTON, D. C.	EVANSVILLE, IND.	CHATTANOOGA	SPOKANE	MELBOURNE
BUFFALO	BALTIMORE, MD.	CHICAGO	MEMPHIS	PORTLAND, ORE.	TOKIO, OSAKA
PHILADELPHIA	CHARLOTTE, N. C.	PEORIA, ILL.	NEW ORLEANS	SEATTLE	BUENOS AIRES

If Time Means Money . . .

TE-PE-CO URINAL STALL PARTITIONS

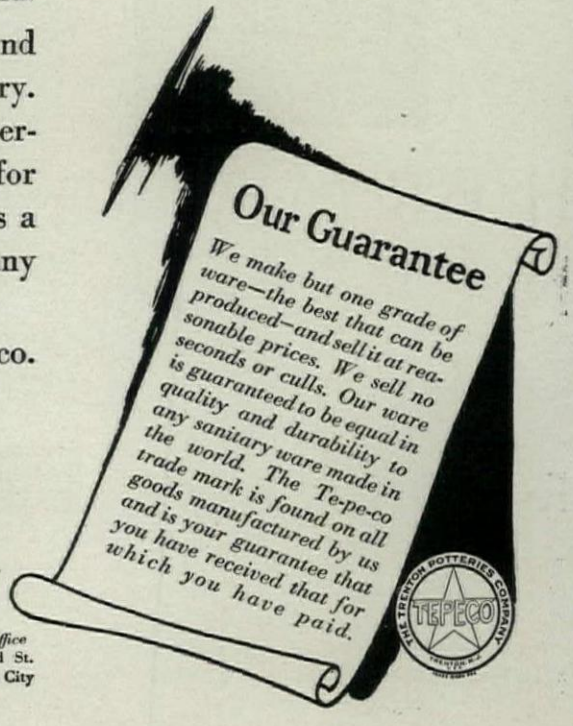
. . . Save the Plumber Many Hours of Installation Costs

ASIDE from the sanitary advantages of Te-pe-co Vitreous China Urinal Stalls, the Te-pe-co design affords an easier and much quicker installation of stalls than is possible with any other kind.

Every battery of Te-pe-co stalls is set up and cut to a perfect fit before leaving the factory. This careful fitting together with the ample overlap of the seam cover to allow adjustment for slight variations in roughing, not only insures a most satisfactory installation but eliminates many hours of the workman's time.

If time means money to you, insist upon Te-pe-co.

Circular on Request

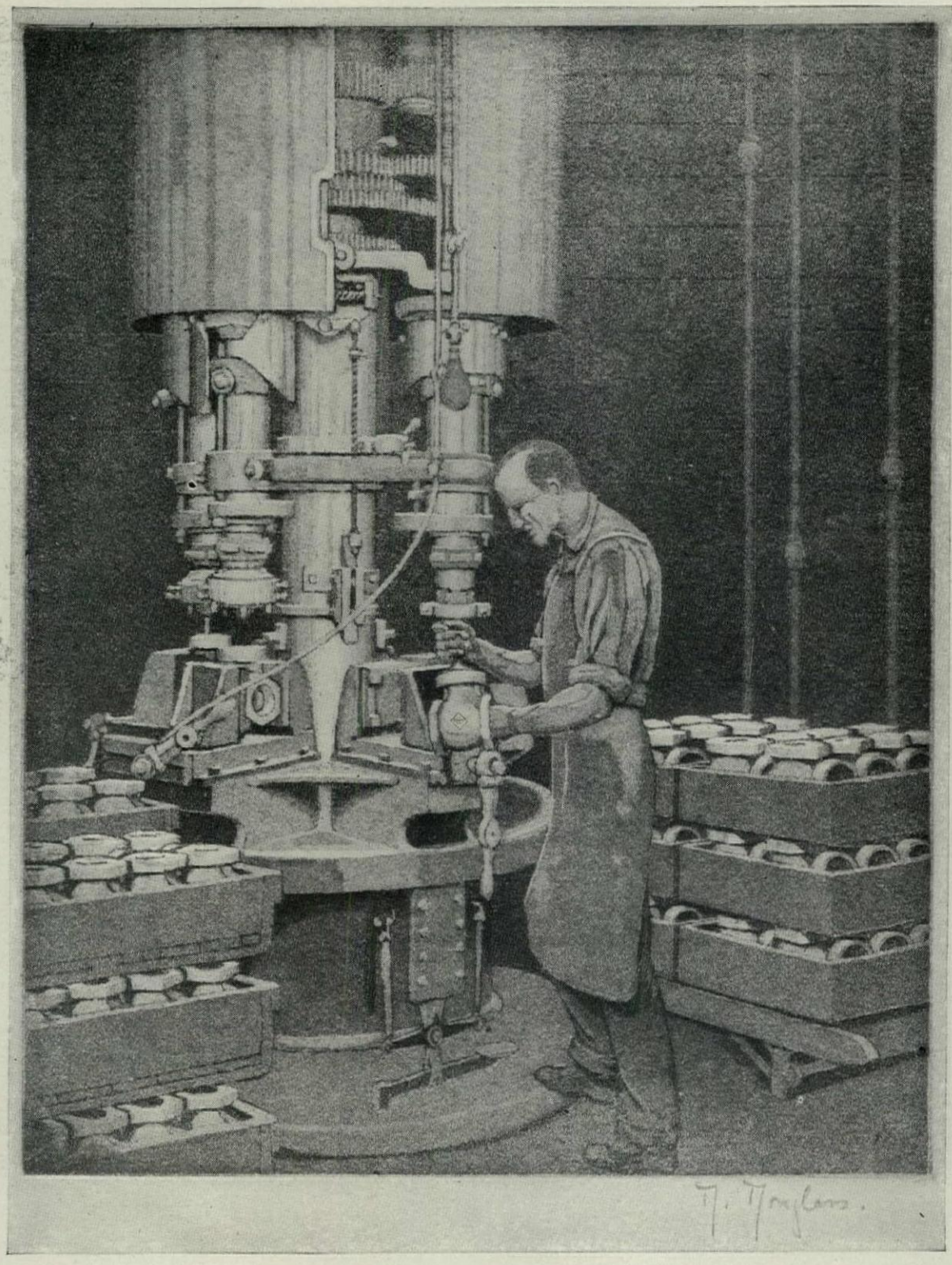


TE-PE-CO

THE TRENTON POTTERIES COMPANY

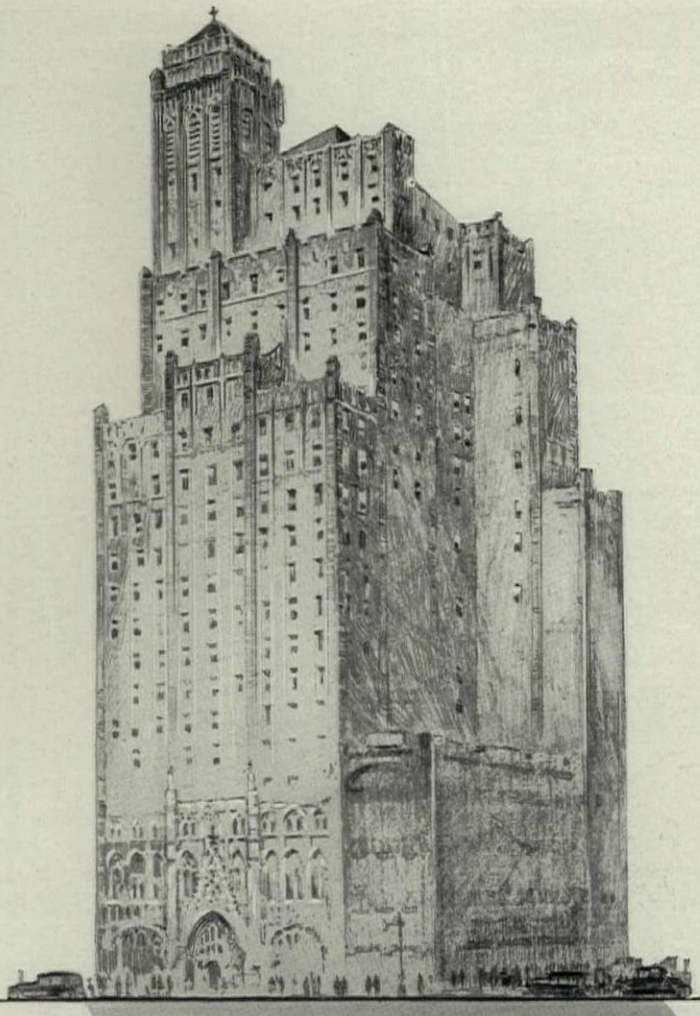
TRENTON, N. J., U. S. A.

National Showrooms		*Branch Offices*	*Export Office*
New York City—101 Park Ave. Entrance on 41st St.	Philadelphia Architects' Bldg. 17th & Sansom Sts.	Boston and San Francisco	115 Broad St. New York City



GAUGING . . . ACCURACY IS THE WATCHWORD

A Jenkins Valve is machined to a standard of accuracy that permits complete interchangeability. Continual, systematic gauging assures perfect fit of every part. The assembled valve is a strong, leak-tight unit that gives long-term performance...Jenkins valves are made in standard, medium and extra heavy patterns for practically every valve requirement. Jenkins Bros., 80 White St., New York; 524 Atlantic Ave., Boston; 133 No. 7th St., Philadelphia; 646 Washington Blvd., Chicago; 1121 No. San Jacinto, Houston, Texas; Jenkins Bros., Ltd., Montreal, London.



MANHATTAN TOWERS
NEW YORK CITY

Tillion & Tillion, *Architects*
Gilbert D. Fish, *Structural Engineer*
Easton Structural Steel Company, *Fabricators*
Barr & Lane. Inc., *General Contractors*

Foreshadowing THE MODERN CITY CHURCH

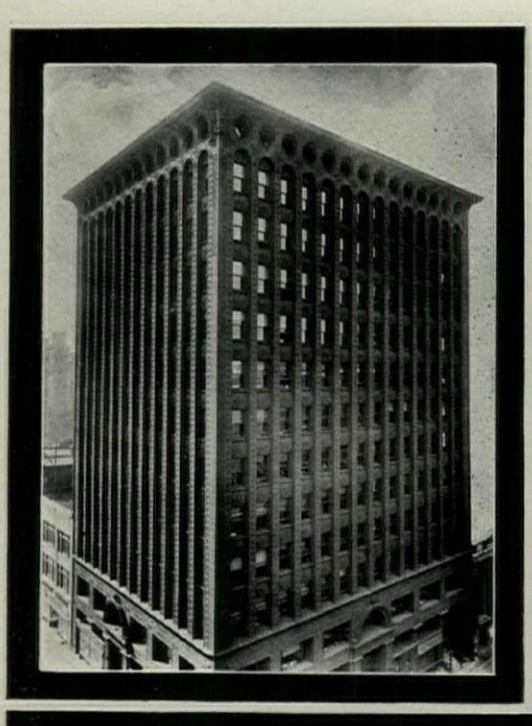
Efficient management demands an adequate return on real estate. The fact that ownership of valuable city property may be vested in a church organization should not discountenance the use of this property in such a manner as to earn an income commensurate with its value. The Manhattan Congregational Church, owning property at 2166 Broadway, New York City, has successfully applied this theory in the erection of Manhattan Towers which combines under one roof a church and hotel.

Manhattan Towers is just as modern in construction as in conception. C B Sections, representing the latest innovation in structural steel, were used in the framework of this modern city church. The popular demand for C B Sections, for all types of construction involving the use of structural steel, indicates their exceptional adaptability to the needs of architects and engineers.

CARNEGIE STEEL COMPANY - PITTSBURGH
Subsidiary of United States Steel Corporation

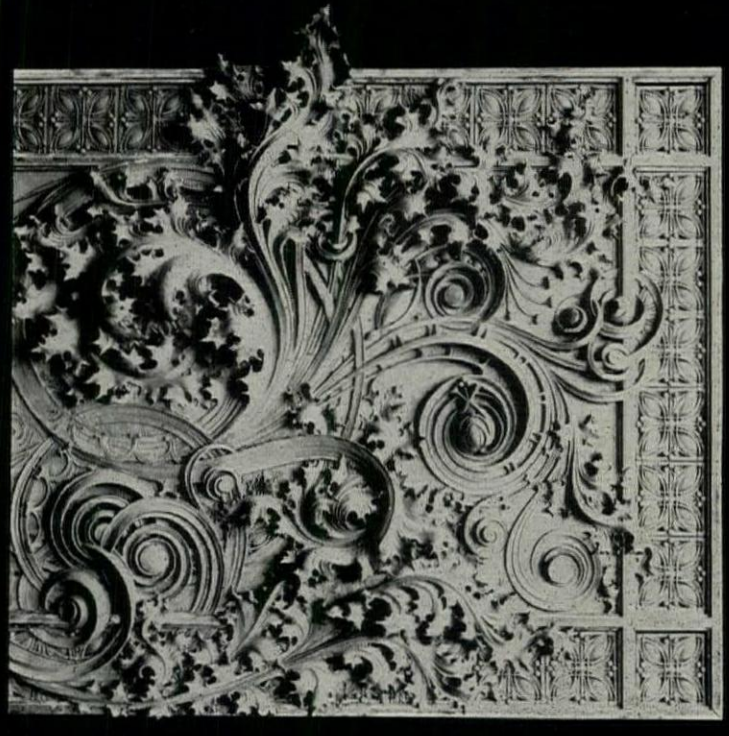
144

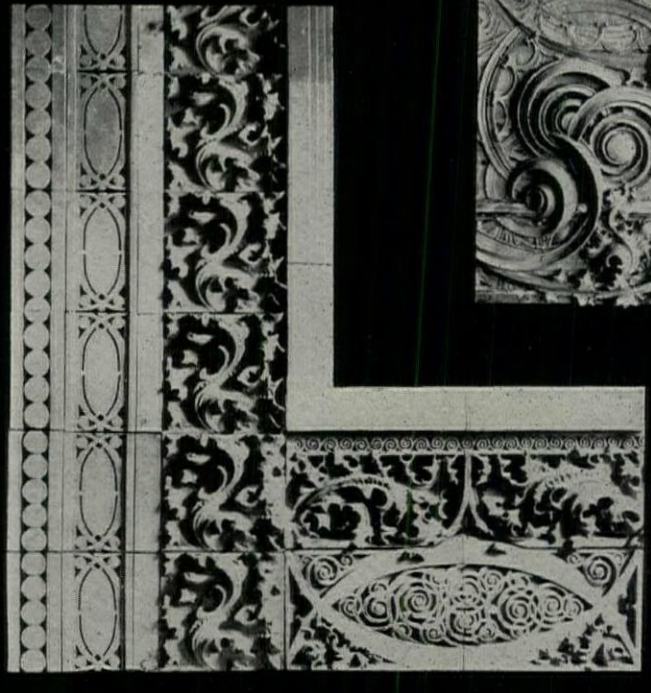
CB SECTIONS

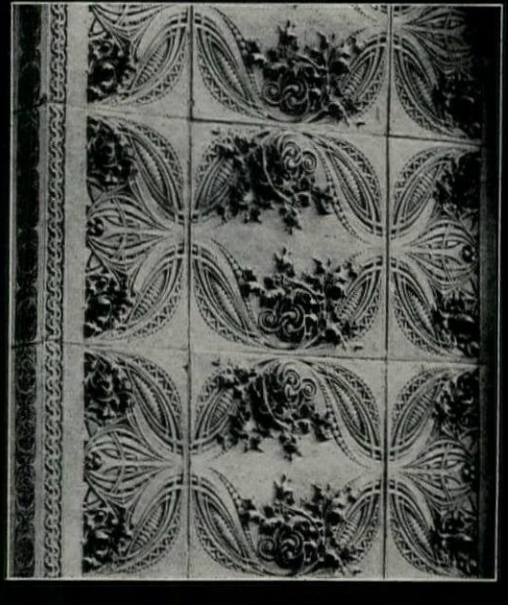


THE PRUDENTIAL BUILDING . BUFFALO, N.Y. (Erected 1895)
ADLER & SULLIVAN . . Architects
Faced with NORTHWESTERN TERRA COTTA
Style: "MODERN" Ornament: SULLIVANESQUE

"A proud and soaring thing rising in sheer exaltation from bottom to top without a dissenting line." *(Sullivan)*





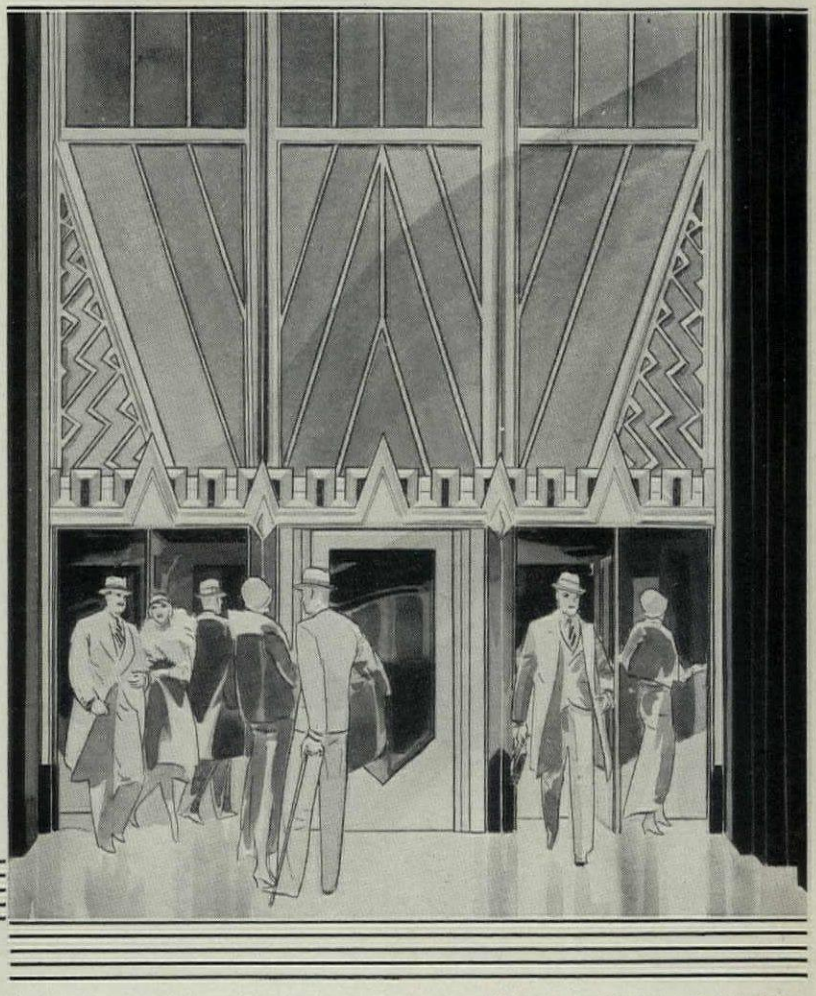


"It is my belief" wrote Sullivan, *"that it is of the very essence of every problem that it contains its own solution"* and having stated the problem of the tall office building in winged words, he solved it in steel and terra cotta, even going so far as to invent an altogether new style of ornament appropriate to the nature of baked clay (Mr. Claude Bragdon . Skyscrapers American Mercury_ March 1931)

THE NORTHWESTERN TERRA COTTA COMPANY

DENVER · CHICAGO · ST. LOUIS

Make ASSOCIATED Your Research Division in the Stainless Steel Field



Close up of entrance to the Chrysler Building—Nirosta KA2 used throughout

NEVASTAIN
CORROSION HEAT & WEAR RESISTING ALLOY STEELS

Associated Alloy Steel Co. is the sole sales division for Corrosion, Heat and Wear Resistance Alloy Steels for

LUDLUM STEEL COMPANY
SHARON STEEL HOOP CO.
TIMKEN STEEL & TUBE CO.

"Licensed under the Armstrong, Fry, Krupp Nirosta, American Stainless Steel Company and Chemical Foundation patents."

STAINLESS STEEL for decorative purposes has come into great prominence in the architectural field within the last two or three years.

What are the merits of each of the various alloy steels for individual purposes?

These are questions that at times, perhaps perplex you. But here is a consulting service offered without charge that will place the entire facts before you and aid in the solution of your problems.

Associated Alloy Steel Company specializes exclusively in the stainless steel field and so is in position to offer a thoroughly unbiased opinion. And as a source of supply the affiliated mills of Associated Alloy are the one place from which you can secure stainless alloy steels in every conceivable form — sheets, bars — tubing — castings, etc. Write the nearest office for complete information.

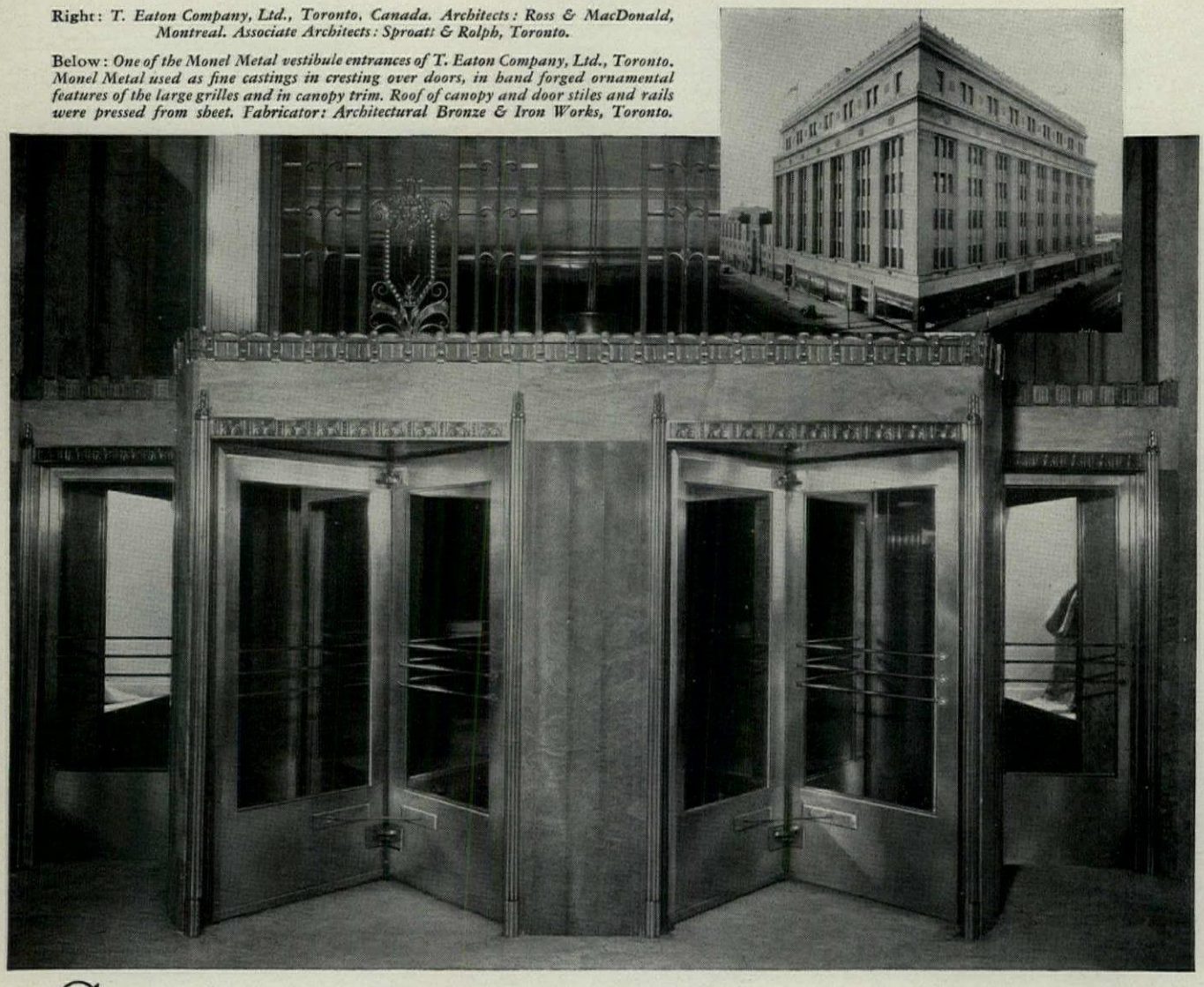
Associated Alloy Steel Co. Inc.

General Office—Union Trust Building, CLEVELAND, OHIO

Branch Offices; NEW YORK · PHILADELPHIA · NEW HAVEN, CONN.
SAN FRANCISCO · DETROIT · CINCINNATI · CHICAGO · LOS ANGELES

Right: *T. Eaton Company, Ltd., Toronto, Canada. Architects: Ross & MacDonald, Montreal. Associate Architects: Sproatt & Rolph, Toronto.*

Below: *One of the Monel Metal vestibule entrances of T. Eaton Company, Ltd., Toronto. Monel Metal used as fine castings in cresting over doors, in hand forged ornamental features of the large grilles and in canopy trim. Roof of canopy and door stiles and rails were pressed from sheet. Fabricator: Architectural Bronze & Iron Works, Toronto.*



Silvery MONEL METAL

used for all interior ornamental work on the new* T. EATON *Store, Toronto

THE new store of T. Eaton Company, Ltd., Toronto, affords a striking example of Monel Metal's ready adaptability to modern design.

Monel Metal was used for all interior ornamental work throughout this beautiful store. Revolving doors...swing doors...grilles...stair and hand railings...elevator doors...elevator cab trim...switch plates...directory boards—all gleam with the modern, platinum-like beauty of Monel Metal. Some of the ornamental features were cast, some were hand forged, others pressed from sheet—demonstrating how Monel Metal lends itself to a variety of fabricating operations.

The choice of Monel Metal for all ornamental metal work in this modern store was dictated by this silvery Nickel alloy's rare combination of rust-immunity, corrosion-resistance, cleanability and enduring attractiveness. Monel Metal always retains its lustrous beauty despite hard wear and repeated cleaning. It is strong as steel and has no coating to chip, crack or wear off.

The ornamental uses of Monel Metal and their economical design are interestingly discussed in a new booklet—"Practical Design in Monel Metal."

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

A HIGH NICKEL ALLOY

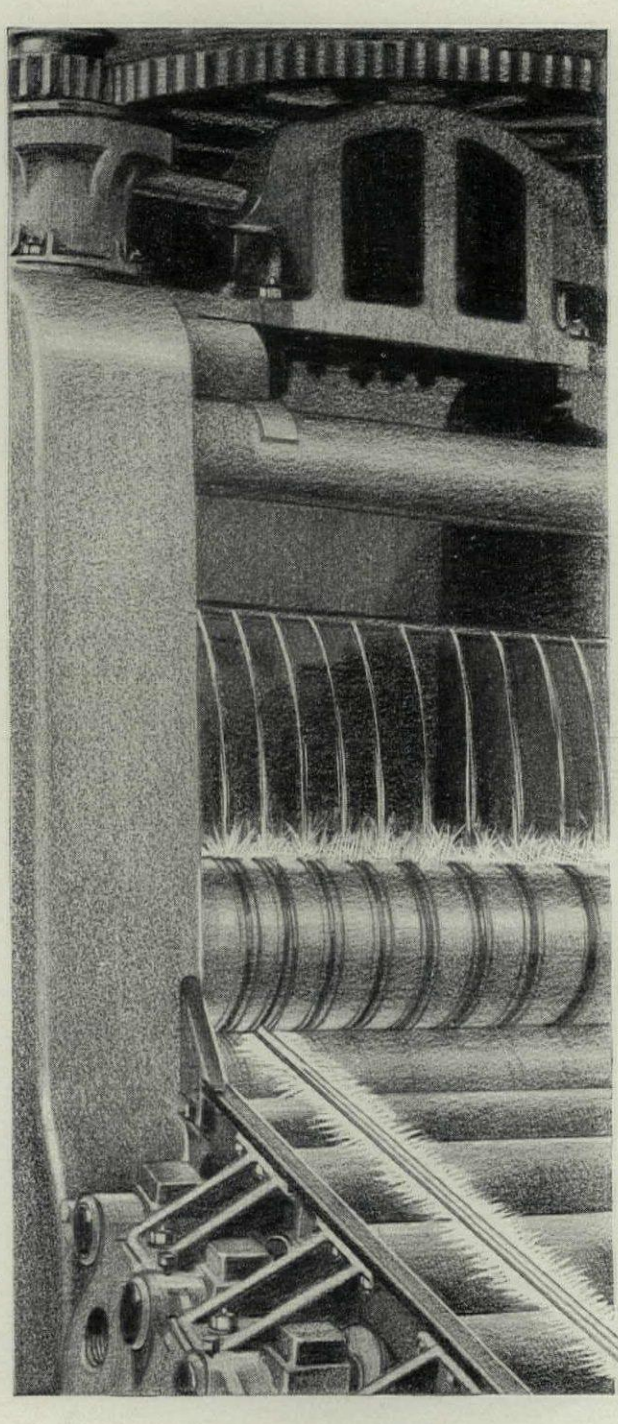
MONEL METAL

NICKEL ALLOYS LOOK BETTER LONGER

Monel Metal is a registered trade mark applied to a technically controlled nickel-copper alloy of high nickel content. Monel Metal is mined, smelted, refined, rolled and marketed solely by International Nickel.

INCO MONEL METAL TRADE MARK

INCOMPARABLE



..Wrought Iron Windows Bayley Built..

DESIGNERS and builders of wrought iron products for architectural use ever since the early eighties, Bayley craftsmen are entirely at home with wrought iron . . . and because Bayley Built Wrought Iron Windows embody the matured skill resulting from fifty years of achieving, they are not to be compared with windows lacking this rich background of knowledge and experience. In design and workmanship, they are truly incomparable, a new conception of quality.

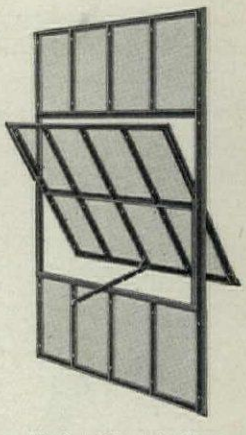
Only "Genuine Wrought Iron," tough and durable, is used . . . unaffected by steam, fumes, salt water and salt air . . . unimpaired after long and hard usage. Add to Bayley proven quality the finest wrought iron obtainable, and you have windows worthy of enthusiastic recommendation for the most important projects. Complete information on request. The William Bayley Company, 134 North St., Springfield, Ohio.

• • •

District Offices

New York, 67 W. 44th St.
Boston, 5 Park St.
Chicago, 75 E. Wacker Drive
Cleveland, 449 Terminal Tower
Washington, 1427 I St., N. W.
Atlanta, 808 Norris Bldg.
Springfield, O., North St.

Sales Agencies also in Principal Cities



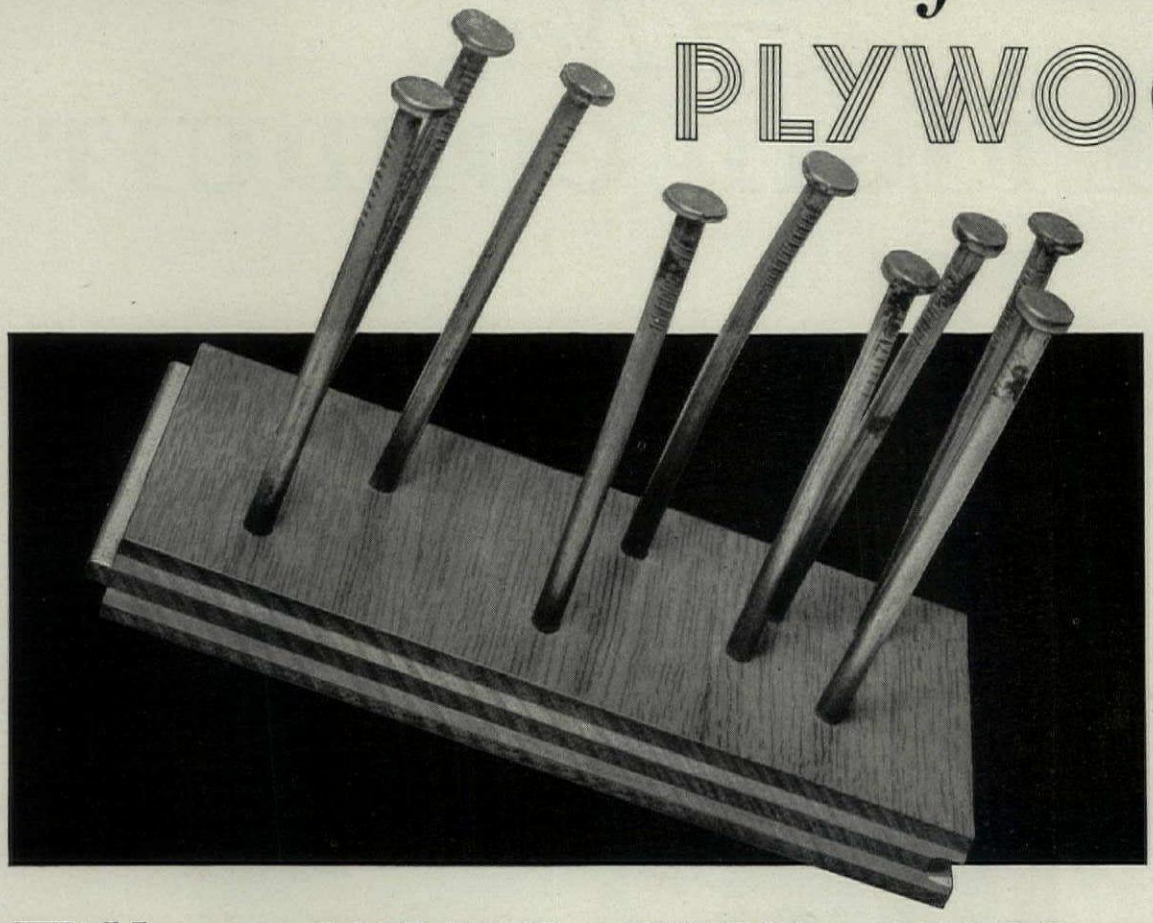
Bayley Wrought Iron Pivoted Windows are particularly adapted for railroad terminals, docks, chemical plants, and all places where service conditions are severe.

BAYLEY

WINDOWS & DOORS

STEEL..WROUGHT IRON..BRONZE..ALUMINUM

FLOORING *from* PLYWOOD



Will not SHRINK · SWELL · WARP *or* SPLIT

NO other flooring will stand such a test as that shown above. Nearly half a pound of large spikes driven into a piece of Uplyco plywood flooring six inches wide and two and one-half inches long. There is no sign of splitting, warping or swelling. The most careful measurements fail to disclose any expansion in this piece of flooring. This is not a special laboratory test but one which you may make yourself at any time, with a piece of our flooring, hammer and nails. It illustrates the inherent strength and durability of Uplyco plywood flooring.

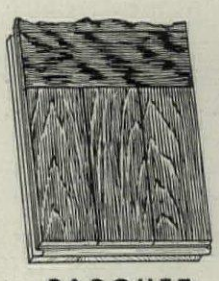
With these advantages you have also beauty such as was never before possible in hardwood flooring due to scientific factory pre-finishing when desired, and to the use of carefully selected and sawn hardwood facing.

Send for our A. I. A. catalog giving complete information about this new and better flooring.

UNITED PLYWOOD SALES CORP.

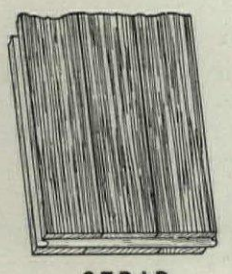
Main Office . . New Albany, Ind.

Address inquiries to Flooring Division, Portsmouth, Ohio



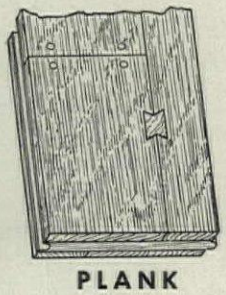
PARQUET

6'0" lengths, 4 and 6" widths.



STRIP

6'8" lengths, 6" widths; white oak, red oak and rock maple.



PLANK

Random widths and lengths in three styles, modern, homestead, period.

UNITED PLYWOOD CORP. 1930

UPLYCO

BREECE GAUSE-BEARD UNITED VENEER NEW ALBANY VENEERING

TRADE MARK—REGISTERED U.S. PATENT OFFICE

106 "SILENTS" *in a* SINGLE MILE

...*on this street in* "SILENT TOWN"

All Silent Automatic models listed as standard by Underwriters' Laboratories

For Warm Air, Steam and Hot Water Heating Systems —Old or New Homes

STARTING from a single installation in a single home in 1925, Silent Automatic oil burners have so closely paralleled the development of the Detroit Golf Club district, that today there are over 300 "Silents" on three adjoining streets within a single mile.

The growing demand for Silent Automatic oil heat in exclusive residential sections of this type could result only from overwhelming owner satisfaction based on dependable, economical performance.

Only "Silent" can point to such user-communities as these, which have invariably sprung up around single installations, through the simple process of neighbor-to-neighbor advertising.

Homes in these miniature Silent Towns represent the best in architecture and construction. They are the type of homes whose owners, nowadays, are *demanding* the comfort and convenience so positively assured by Silent Automatic oil heat.

SILENT AUTOMATIC CORPORATION
12001 E. Jefferson Ave., Detroit, Michigan

SILENT AUTOMATIC

THE NOISELESS OIL BURNER

(407)

Made by the World's Largest Producer of Domestic Oil Burners

The public is responsible

but WHO gets the blame ?

You can't control the slam-bang abuse which the vandal public inflicts on toilet seats in public washrooms. But you can control your specifications and see to it that the seats installed are beyond the public's ability to destroy.

• Clients will thank you for specifying Whale-bone-ite Seats. Guaranteed for the life of the building, they are tagged with no future replacement expense. They defy time and abuse. They make a perpetual fact of the ideal you had in your specifications of beauty and cleanliness for this important fixture. Yet they cost no more than ordinary seats.

• It's easy to give your clients the advantages of Whale-bone-ite. Glance through every specification written in your office. See that Whale-bone-ite Seats are specified wherever service and sanitary requirements are severe. Through the cooperation of Architects, many of America's finest buildings are already equipped.

Send Coupon for New Book
"Install Them Once They Last Forever"

Get the complete story of Whale-bone-ite Seats as told in this new book. No cost or obligation. Send coupon today. Address, The Brunswick-Balke-Collender Company, Dept. EE-3, 623-633 So. Wabash Avenue, Chicago, Ill.

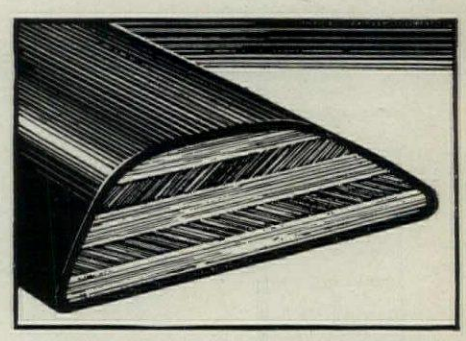
When Specifying, please refer to "Sweet's" Volume D, pages 4912-4917.

Brunswick
LAMINATED
WHALE-BONE-ITE
TOILET SEATS

• It takes a whale of a seat to stand public toilet abuse

In this cross-section note the cross-grain, laminated construction, exclusive with Brunswick, that gives Whale-bone-ite a super-strength that defies time and abuse. It is the only construction that combines unbreakable strength with necessary lightness and sanitary qualities.

Jet-black, glass-smooth and diamond-hard, Whale-bone-ite beauty never wears off seat or hinge. No exposed metal hinges to corrode, to collect dirt or need polishing. No cracks to harbor dirt and germs. Easy to keep clean and sanitary with minimum effort. Non-inflammable. With all these advantages Whale-bone-ite costs no more than the cheapest moulded composition seat made.



WHALE-BONE-ITE CROSS-SECTION

The Brunswick-Balke-Collender Co.
Dept. EE-3, 623-633 So. Wabash Ave., Chicago

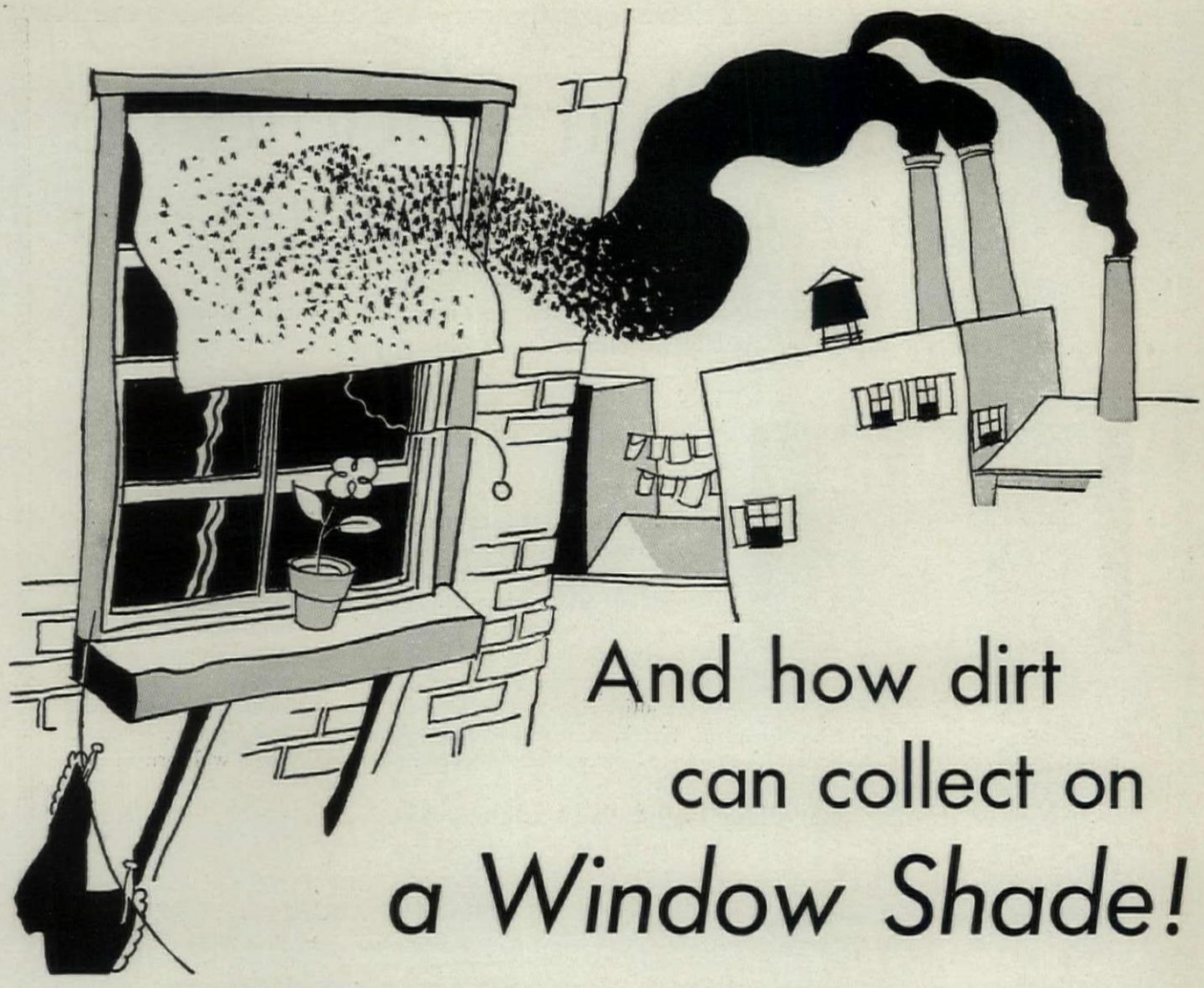
Gentlemen: Please send me without cost or obligation a copy of your new book on Whale-bone-ite Toilet Seats.

Name.....

Name of Firm .....

Street .....

City..... *State*.....



And how dirt can collect on a *Window Shade!*

IT blows in from the street. Drifts up from the floor. Sifts down from the ceiling. And shortly, an ordinary window shade is but a soiled, bedraggled affair that must be replaced by a new shade.

But not so with Tontine Shades. They're washable. When they get soiled, have them scrubbed. They bob up looking good as new again. Think of the money that saves you in replacements.

Tontine Shades are extra durable, too. They last for years. They're impregnated with pyroxylin, the same basic material used in the famous Duco finishes. That's why they're so strong. Why they're washable. Why they won't crack, or fray, or pinhole.

No wonder Tontine Window Shades are found from coast to coast in hotels, schools, office buildings, apartment houses, hospitals and other large buildings.

For complete window shade satisfaction, have your TONTINE Shades mounted on TONTINE Rollers.

We'll gladly send you samples of Tontine Shades. Your name on the coupon below will bring them to you by return mail.

IRVING TRUST COMPANY—NEW YORK

This new and impressive New York business building has a Tontine Shade in every one of its hundreds of windows. Selected, of course, because Tontine Shades can be scrubbed clean when they get soiled, and because Tontine Shades can be counted on for years of wear.

DU PONT TONTINE
REG. U.S. PAT. OFF.
(PRONOUNCED TON-TEEN)

THE *WASHABLE* WINDOW SHADE

E. I. DU PONT DE NEMOURS & CO., INC.
Desk P. 5, Newburgh, N. Y.

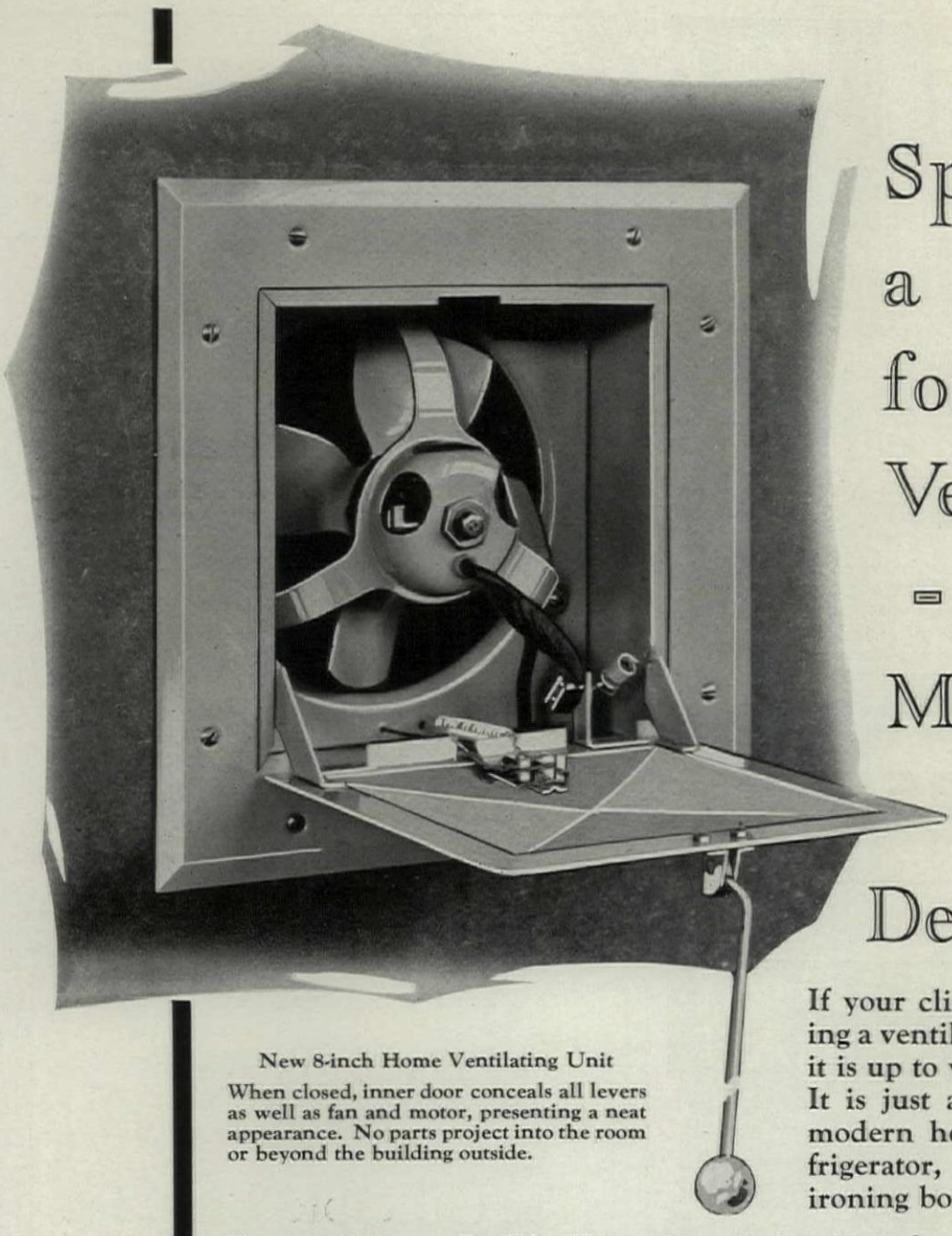
Please send me samples of Tontine Washable Window Shades and complete information about them.

Name_____

Address_____

Canadian subscribers address: Canadian Industries Limited, Fabrikoid Division, New Toronto, Ont., Can.

Consult the Classified Business Directory of your telephone book for the authorized TONTINE *dealer in your city, selected for his reliability*



New 8-inch Home Ventilating Unit

When closed, inner door conceals all levers as well as fan and motor, presenting a neat appearance. No parts project into the room or beyond the building outside.

Specify a Fan for Home Ventilation

Modern Homes Demand It

If your client overlooks mentioning a ventilating fan for his home, it is up to you to recommend one. It is just as much a part of the modern home as the built-in refrigerator, shower, disappearing ironing board, etc.

By specifying a Buffalo Home Ventilating Unit for the home or apartment kitchen, you are assuring the occupants permanent comfort throughout the year. With this fan in operation, cooking odors, greasy smoke and steam are drawn out of the house, and a positive circulation of air is provided through the living rooms.

Write or wire us today for complete details, specification card and prices on our line of Home Ventilating Units.

BUFFALO FORGE COMPANY

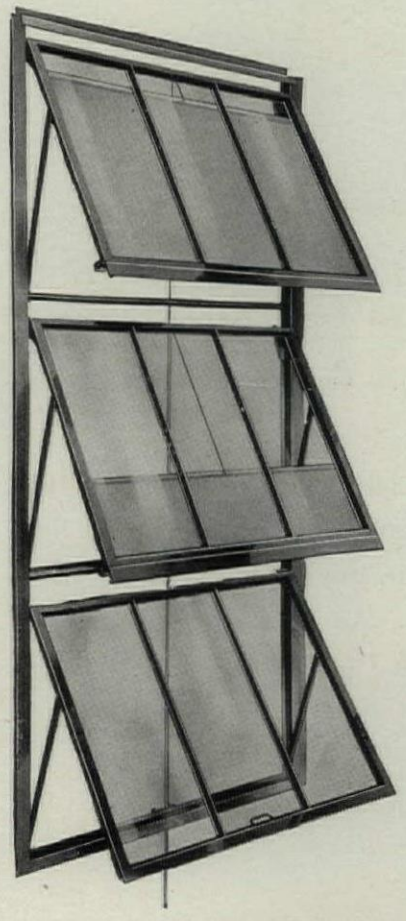
442 Broadway - - - - - Buffalo, New York

In Canada: Canadian Blower & Forge Co., Limited, Kitchener, Ontario

"Buffalo"

8- and 12-inch Units for Home Ventilation

Modern Types of Projected Steel Windows



Donovan Awning Type Steel Windows. Movement of lower sash operates upper sash. All windows may be left open, or upper or lower sash closed. Shades on sash act as awnings. Draughtless ventilation and diffused daylight.

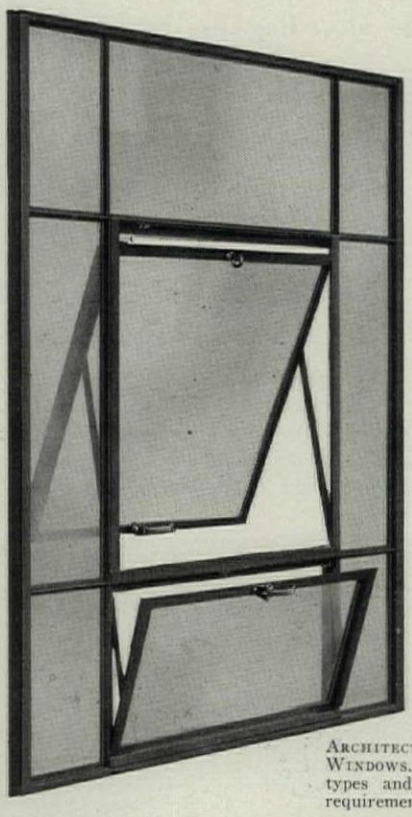
Truscon has carried the development of Projected Steel Windows far in advance of the original commercial type. In Donovan Awning Type, Monumental Projected and Architectural Projected Steel Windows Truscon offers ideal solutions for the window problems in many diversified types of buildings.

Truscon manufactures all types of Steel Windows and welcomes the opportunity of cooperating with architects in selecting the window which will give the most satisfactory results. Your inquiry will have thorough attention.

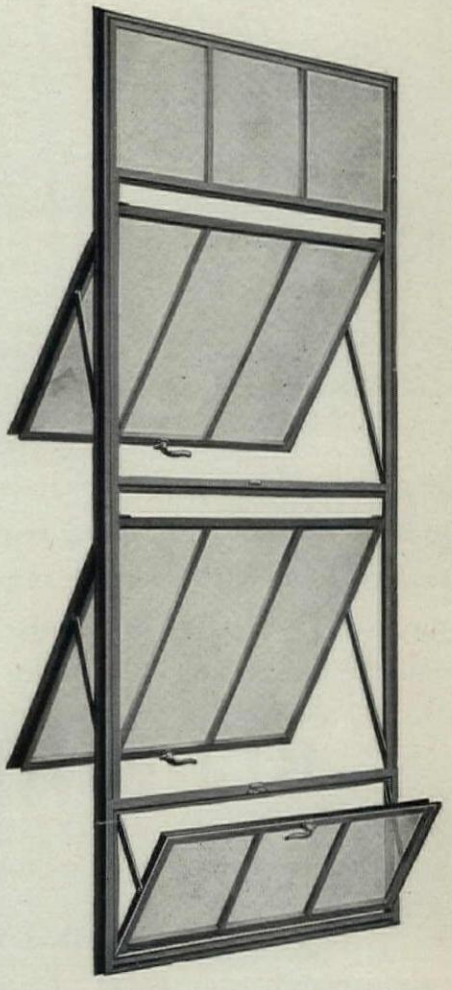
TRUSCON STEEL COMPANY

Youngstown, Ohio

Sales and Service Offices in all Principal Cities



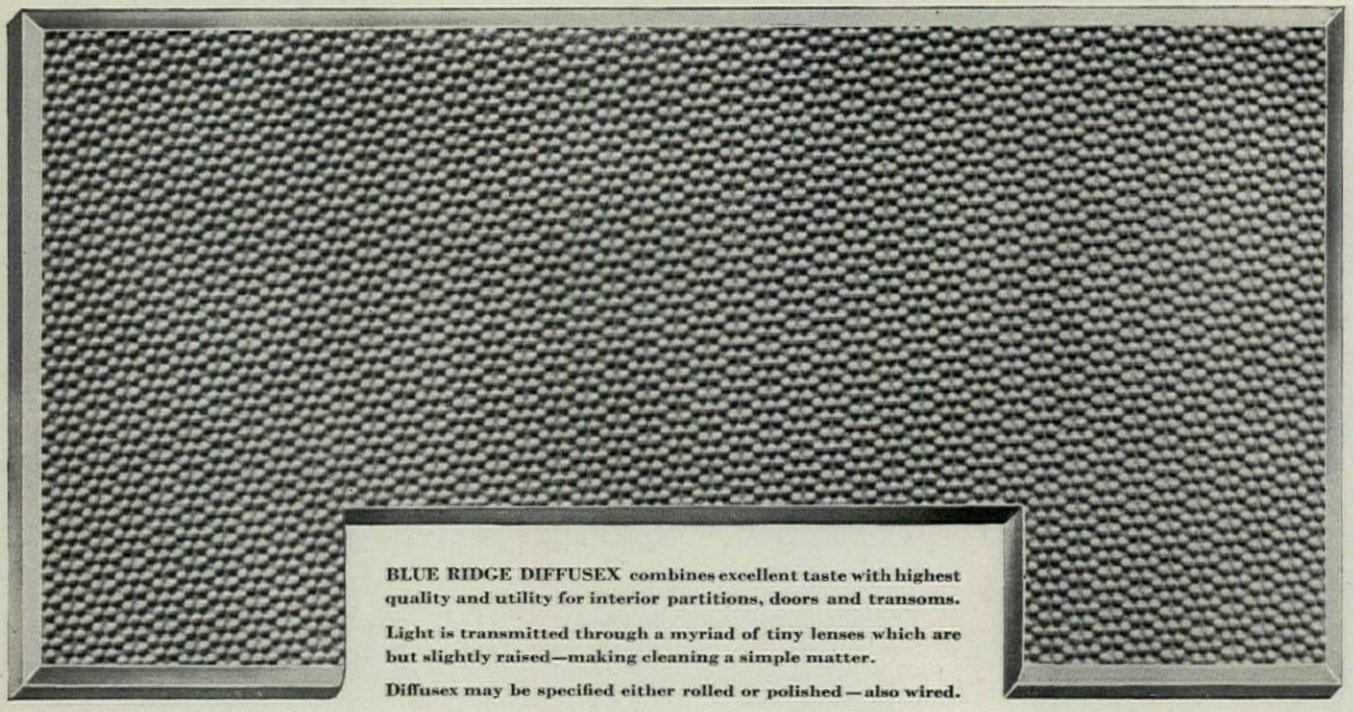
Architectural Projected Steel Windows. Furnished in numerous types and sizes to meet individual requirements.



Monumental Projected Steel Windows. A quality steel window for office and monumental buildings. Superior in design, materials, construction and workmanship. Furnished in numerous standard units with or without hopper vents.

TRUSCON

STEEL WINDOWS » STEEL DOORS » STEEL JOISTS » METAL LATHS » STEELDECK ROOFS » REINFORCING STEEL



BLUE RIDGE DIFFUSEX combines excellent taste with highest quality and utility for interior partitions, doors and transoms.

Light is transmitted through a myriad of tiny lenses which are but slightly raised—making cleaning a simple matter.

Diffusex may be specified either rolled or polished—also wired.

Blue Ridge figured and wire glass, either rough rolled or polished, has been scientifically developed to meet specialized building requirements. All figured glass is designed for the maximum light transmission and ease of cleaning. Blue Ridge wire glass is free from the bubble clusters about the wire which so often mar the beauty of this type of glass. An exclusive method of manufacture centers the wire, thus affording the maximum in fire protection and strength.

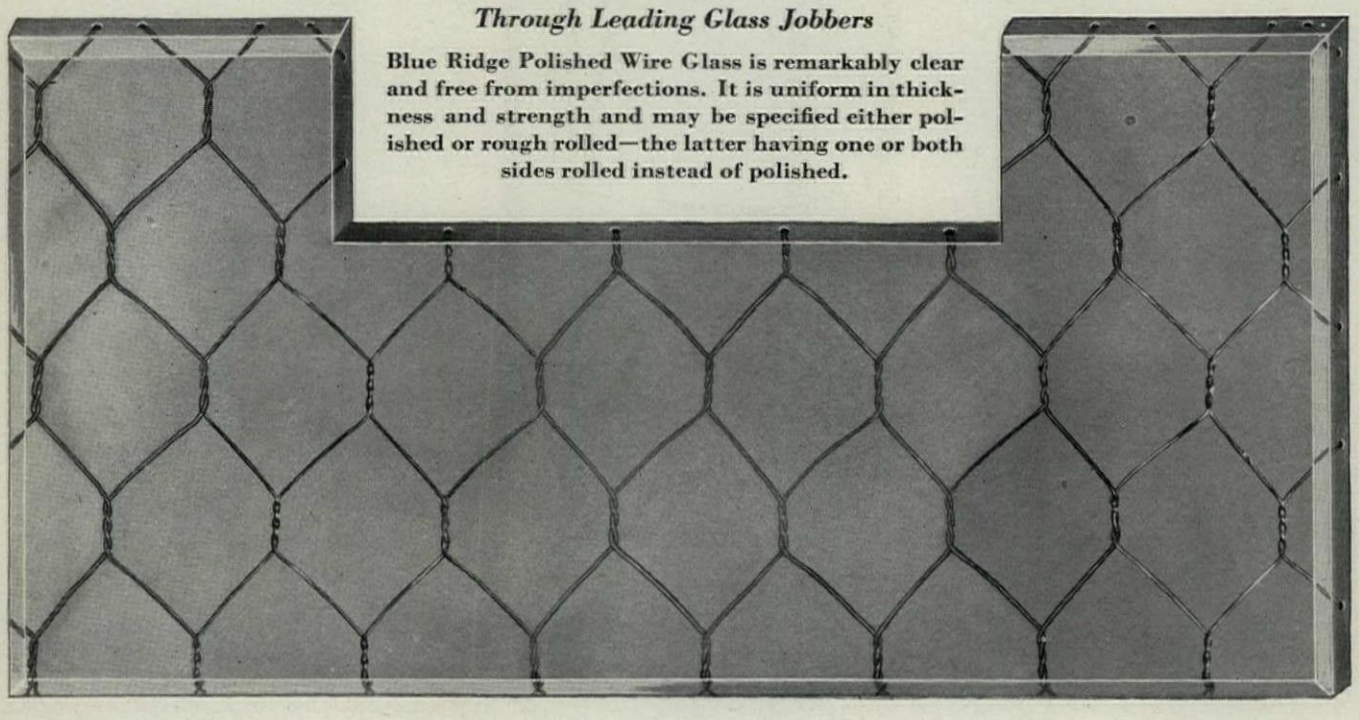
BLUE RIDGE GLASS CORP.

KINGSPORT, TENNESSEE

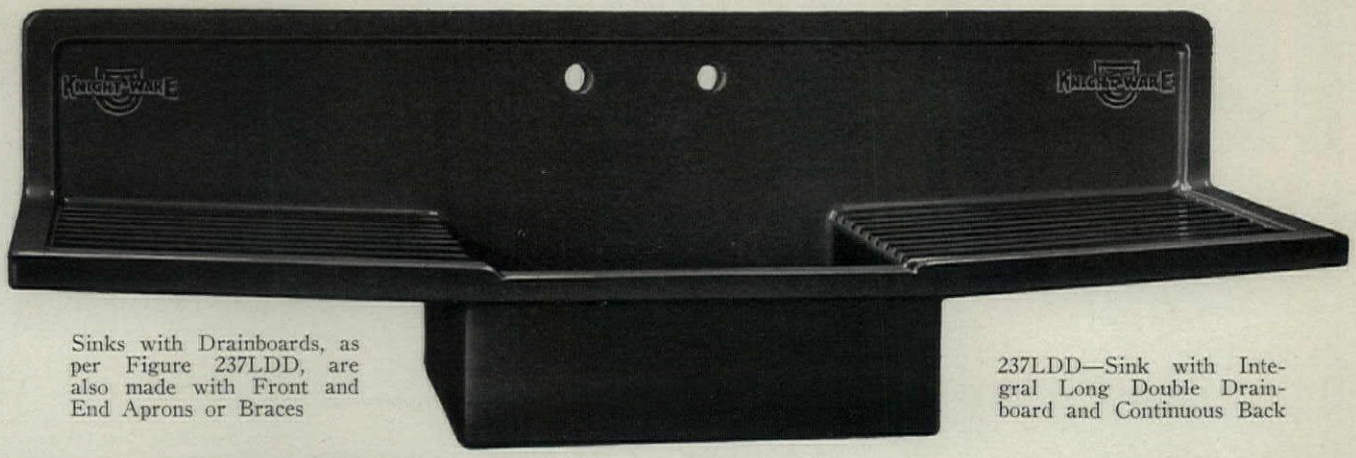
Sold by the

LIBBEY·OWENS·FORD GLASS CO., TOLEDO, OHIO

Through Leading Glass Jobbers



Blue Ridge Polished Wire Glass is remarkably clear and free from imperfections. It is uniform in thickness and strength and may be specified either polished or rough rolled—the latter having one or both sides rolled instead of polished.



Sinks with Drainboards, as per Figure 237LDD, are also made with Front and End Aprons or Braces

237LDD—Sink with Integral Long Double Drainboard and Continuous Back

Knight-Ware Laboratory Sinks

best suited for your laboratory because

Fig. 238—Laboratory Sink with Back cut out for Trough

they're positively acid proof

The Knight body texture is absolutely impervious to the action of acids, alkalies, chemicals and corrosive solutions. It will not *chip, flake* or *peel.*

they're easy to clean

No slime will adhere to the smooth, well glazed surfaces. Rounded corners also facilitate cleaning.

they're made in one piece

No joints, no seams to pull apart and leak. Outlets or tailpieces supplied as an integral part of the Sink saves cost of metal outlet and labor of installing.

they're permanent

Will *never* be attacked by corrosives, *never* disintegrate, will last the life of the building.

We supply Acid-Proof Pipe and Fittings for Waste and Ventilating Lines in all bores from 1" up to 60". We are also prepared to serve you with KNIGHT-WARE Laboratory Sinks, Sumps and Catch Basins, Ventilating Flue Caps, etc., in fact, any acid-proof laboratory equipment that you may need.

for* Economy, Security, Permanency *Specify

KNIGHT-WARE

Drain Lines : Laboratory Sinks
Ventilating Ducts : Acid Dilution Basins : Ventilating Duct Caps

Our new 48-page catalog on KNIGHT-WARE LABORATORY EQUIPMENT containing complete details and fully illustrated will be mailed upon request. Send for your copy.

MAURICE A. KNIGHT

147 Settlement Street **Akron, Ohio**

GUARANTEED SATISFACTORY — MAURICE A. KNIGHT AKRON OHIO — ACID-PROOF CHEMICAL STONEWARE

KNIGHT-WARE

"IT IS THE BODY ITSELF"

Offices

New York City 804 World Building *Beekman 1657*	**Philadelphia** 1600 Arch Street *Rittenhouse 6300-6301*	**Chicago** 230 N. Canal Street *Franklin 4658*	**St. Louis** 1st National Life Bldg. *Main 1784*
San Francisco Merchants' Exchange Building *Douglas 375*	**Niagara Falls** 309 United Office Bldg. *Niagara Falls 507*	**Montreal, Que.** 1307 Notre Dame Street, West *Main 2625*	

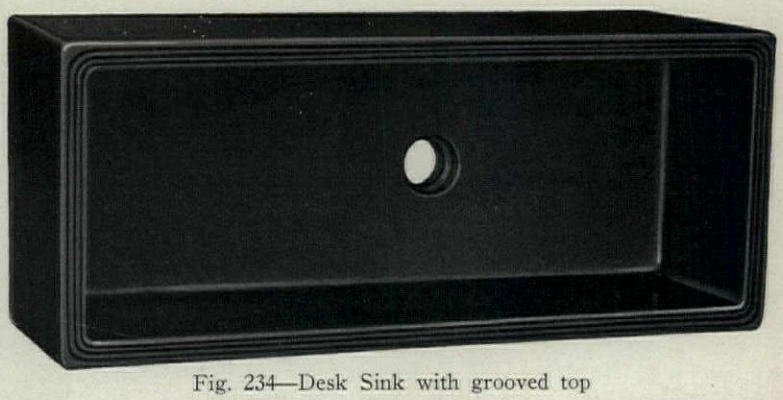


Fig. 234—Desk Sink with grooved top

WITH AND FOR OUR ADVERTISERS

ADVERTISING OFFICE, 419 FOURTH AVE., NEW YORK, N. Y., PHILIP H. HUBBARD, *Advertising Manager*
District Offices: 1050 Straus Building, Chicago; 953 Leader Building, Cleveland; 381 Bush St., San Francisco.

A. C. Deming has established an office in the Union Savings Bank Building at 216 Tremont Street, Boston, and will represent Gillis & Geoghegan, Inc., manufacturers of ash, garbage and rubbish removal equipment and G & G Atlas Systems, Inc., manufacturers of pneumatic tubes. In his previous connection Mr. Deming sold these lines among others but will now devote himself exclusively to sales and engineering for Gillis & Geoghegan and G & G Atlas Systems in Massachusetts and northern New England.

A joint announcement has been made by The Locomotive Terminal Improvement Company of Chicago and A. M. Byers Company, wrought iron manufacturers, covering the introduction of a new line of wrought iron welding elbows. These new elbows known as "Weldells" range in size from 2" to 12" and are manufactured with the same radius and center to face measurements as standard radius fittings. In the forging, a tangent is formed on each end, making "Weldells" interchangeable with standard fittings and the ends are beveled 45 degrees for welding. Stock sizes include both standard and light weight (10-gauge) sections. "Weldells" are forged from wrought iron plate with a smooth, uniform internal diameter and a reinforcing rib along both the outer and inner curvature of radius. The process permits "Weldells" to be made from the same material as the balance of the piping system.

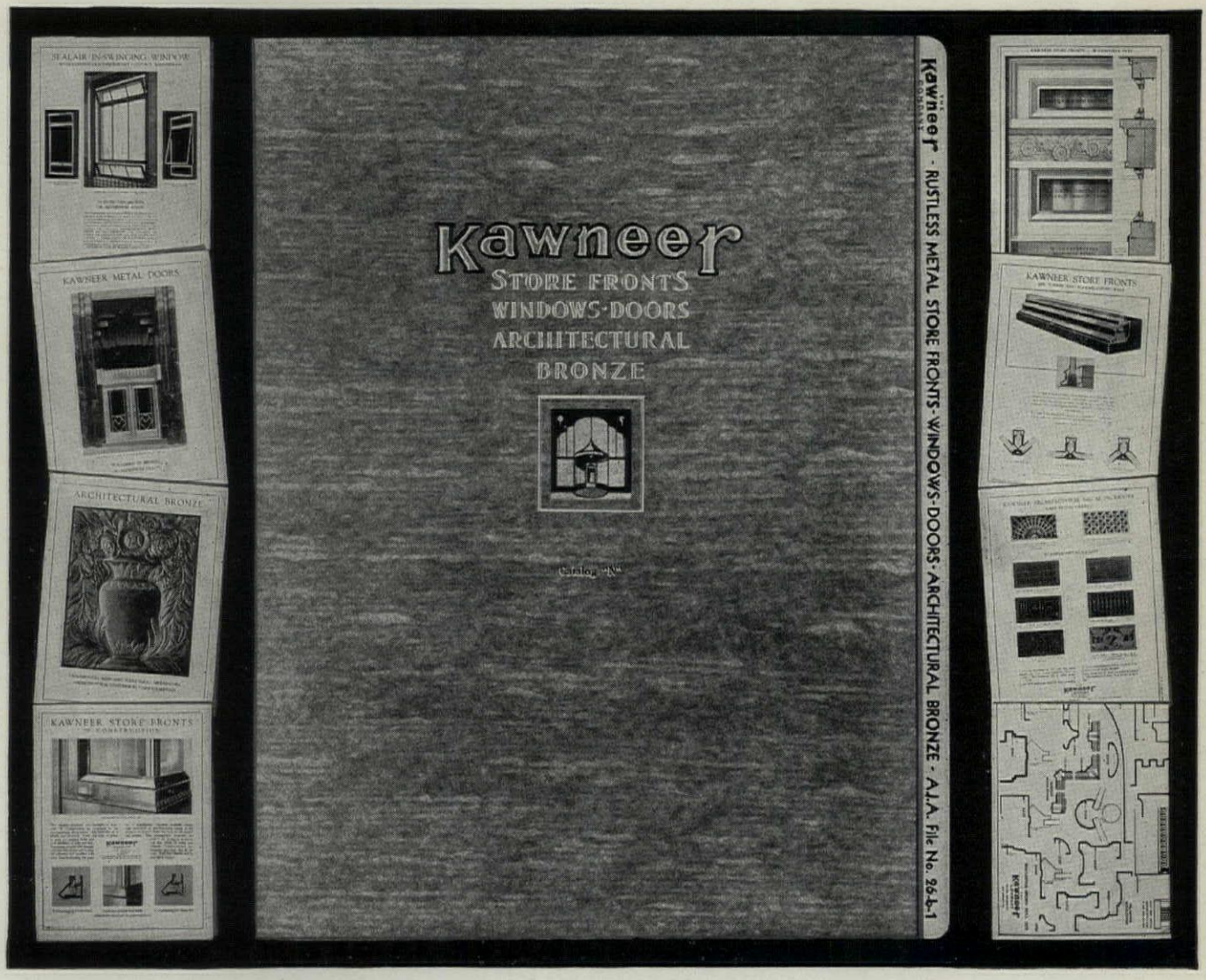
At a recent meeting of the board of directors of the Westinghouse Electric & Manufacturing Company, J. S. Tritle was elected vice-president and general manager in charge of manufacturing, sales and engineering operations of the company, reporting to the president, F. A. Merrick. In his new position as vice-president and general manager, Mr. Tritle will retain his headquarters in the Westinghouse Company's main works at East Pittsburgh, Pa. Effective June 1, 1931, J. C. McQuiston retired as general advertising manager of the company after serving in that capacity for 29 years. Mr. McQuiston was formerly president of the Association of National Advertisers and for many years a leader in associational work in the electrical and allied industries. Frank Thorton, Jr., manager of residence engineering, general engineering department, has been appointed manager of association activities of the company to succeed R. W. E. Moore, resigned.

One of the more recent developments in the oil burner field is the draft stabilizer that has been introduced by the Silent Automatic Corp., of Detroit. The purpose of it is to automatically control the intensity of the natural draft, an important factor, especially when starting an oil burner. The draft stabilizer is attached to the vertical or horizontal smoke pipes of any domestic type of heater. It has a mechanically counterbalanced damper that swings free on a lever arm in the smoke pipe. It can be adjusted to a fine setting for the most efficient flame and assure its stability. When set for the most efficient oil burner operating conditions it adjusts itself to compensate for varying draft conditions.

The General Electric Company announces a standard Thyratron reactor control equipment type CR7502A1 for use in governing the operation of mobile color lighting and designed for numerous applications, including exterior floodlighting, show window lighting, etc. Heretofore equipments for use in these various applications have been designed more or less specially for each individual case, whereas this new design allows the control for the majority of installations to be built up of standard equipment.

OUR NEW CATALOG PORTFOLIO HAS BEEN MAILED

IF YOUR COPY HAS NOT ARRIVED,
SEND US YOUR NAME AND ADDRESS



CONTAINS FULL DESCRIPTION OF OUR
SEALAIR WINDOWS, ARCHITECTURAL CASTINGS, DOORS AND STORE FRONTS OF RUSTLESS METAL

THE
Kawneer
COMPANY
NILES, MICHIGAN
AND SUBSIDIARIES

ARCHITECTS DESIGN »« KAWNEER BUILDS

". . . since steam generates only as needed . . . you save fuel"

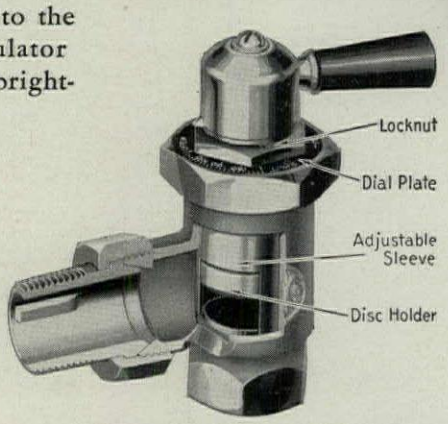
WHEN you and your client discuss heating methods, quite naturally you will want to recommend a system that gives maximum comfort with a minimum operating expense.

These facts about Hoffman Controlled Heat will enable you to show him just why this system is a *profitable investment* for any builder.

In the first place, *room-by-room* temperature control! By turning the handle of the Modulating Valve, the occupant of any room can regulate the radiator's heat output to suit. Full heat, three quarters, one-half, or none at all. Without affecting other rooms.

Demands made for more or less heat are instantly transmitted to the super-sensitive Damper Regulator which automatically checks or brightens the fire. *Thus steam generates only as called for and fuel is saved!*

Since Hoffman Controlled Heat is a vacuum system, it operates on low pressure steam. Again economy! Obviously, less fuel is required to produce ounces of pressure than pounds.



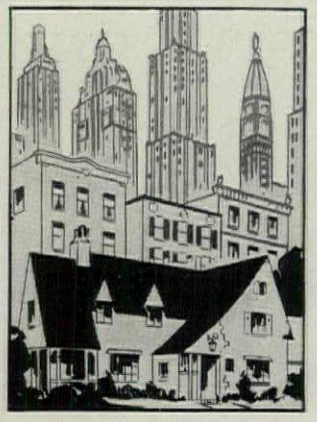
Simply turning the dial of a No. 7 Hoffman Modulating Valve externally adjusts the port to suit any sized radiator. The system may be balanced without guesswork—every radiator, regardless of size or distance from the boiler, heats quickly and evenly.

And no matter how inexperienced the owner, he can operate this dependable system with perfect satisfaction. The Hoffman Differential Loop positively prevents water from leaving the boiler, should an abnormally high pressure be built up.

This vapor-vacuum system is far from being complicated or costly. Only five units are involved—a Modulating Valve and Trap for each radiator; a Kompo Gage, Damper Regulator and Differential Loop in the boiler room. Any good contractor can install them without the slightest difficulty.

All this you can explain to prospective builders of homes, apartments, or industrial buildings, with the surety that Hoffman Controlled Heat will contribute to complete satisfaction. This modern heating equipment may be added to any boiler or radiators, whether fired by oil, gas or coal. When properly installed, it will be unqualifiedly guaranteed by its maker.

Reference to our 44-page insert in Sweet's catalog will give you full information about Hoffman Controlled Heat, Hoffman Venting Valves and Hoffman-Economy Pumps. Or write for our latest booklet. Hoffman Specialty Company, Inc., Dept. PP-16, Waterbury, Conn.



In homes, apartments, hotels or office buildings, the comfort and economy of Hoffman Controlled Heat may be included.

HOFFMAN *Controlled Heat*

now ready

Armstrong Offers a New Low-Cost Building Insulation That Saves Fuel . . . Insures Comfort

ARMSTRONG'S Temlok, introduced to architects and the building industry in 1930 for roof insulation, now is available for general applications.

Here is a fibreboard building insulation *gratifyingly low in cost* and with improved physical properties which mean *greater fuel saving* and *permanent home comfort.* Temlok is made by Armstrong, famous for fine linoleum and long known as a leading manufacturer of corkboard.

Armstrong's Temlok is a definite improvement in fibreboard insulation. It materially reduces fuel bills and gives greater comfort inside the home. It has high resistance to moisture and so does not lose its insulating efficiency. Temlok is made from the heartwood fibres of Southern pine, the fibres of which are impregnated with natural resin. This makes them practically moisture proof. When the fibres are fabricated into strong, sturdy boards, a high resistance to moisture is retained. So Temlok retains its insulating efficiency in actual service.

Temlok is a golden tan board of pleasing texture, one full inch or full half-inch in thickness. It is made as Temlok Insulating Board, 4′ wide, 6′ to 12′ long, and as Temlok Insulating Lath, 18″ wide, 48″ long, long edges shiplapped. It assures lifetime insulation as a plaster base, as sheathing, or as wall board.

We'll gladly send you the Temlok specifications book and samples of these new Temlok products. There's a branch office near you. Or, if you prefer, write for special information to the Armstrong Cork & Insulation Co., 902 Concord St., Lancaster, Pa.

Armstrong's (A) Product

Armstrong's TEMLOK BUILDING INSULATION

Printing of Pencil Points by The Gillespie Bros., Inc., Stamford, Conn., U. S. A.

ACCURATE LUXURIOUS PERFORMANCE •Westinghouse ELEVATORS

Such magnificent, towering structures, forced upward by the expansion of commercial growth, depend upon the best in electrical and mechanical engineering to correctly fulfill today's demands for accuracy, comfort and dependability in vertical transportation . . . Westinghouse Elevators also add a luxurious riding comfort — smooth, swift and quiet . . . a modern performance.

Naturally, today's builders have a right to expect the best elevators from Westinghouse.

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Westinghouse Elevators are the logical highways of modern architecture

FIVE FIFTEEN MADISON AVENUE BUILDING . . . NEW YORK

J. E. R. CARPENTER
ARCHITECT

DWIGHT P. ROBINSON & COMPANY
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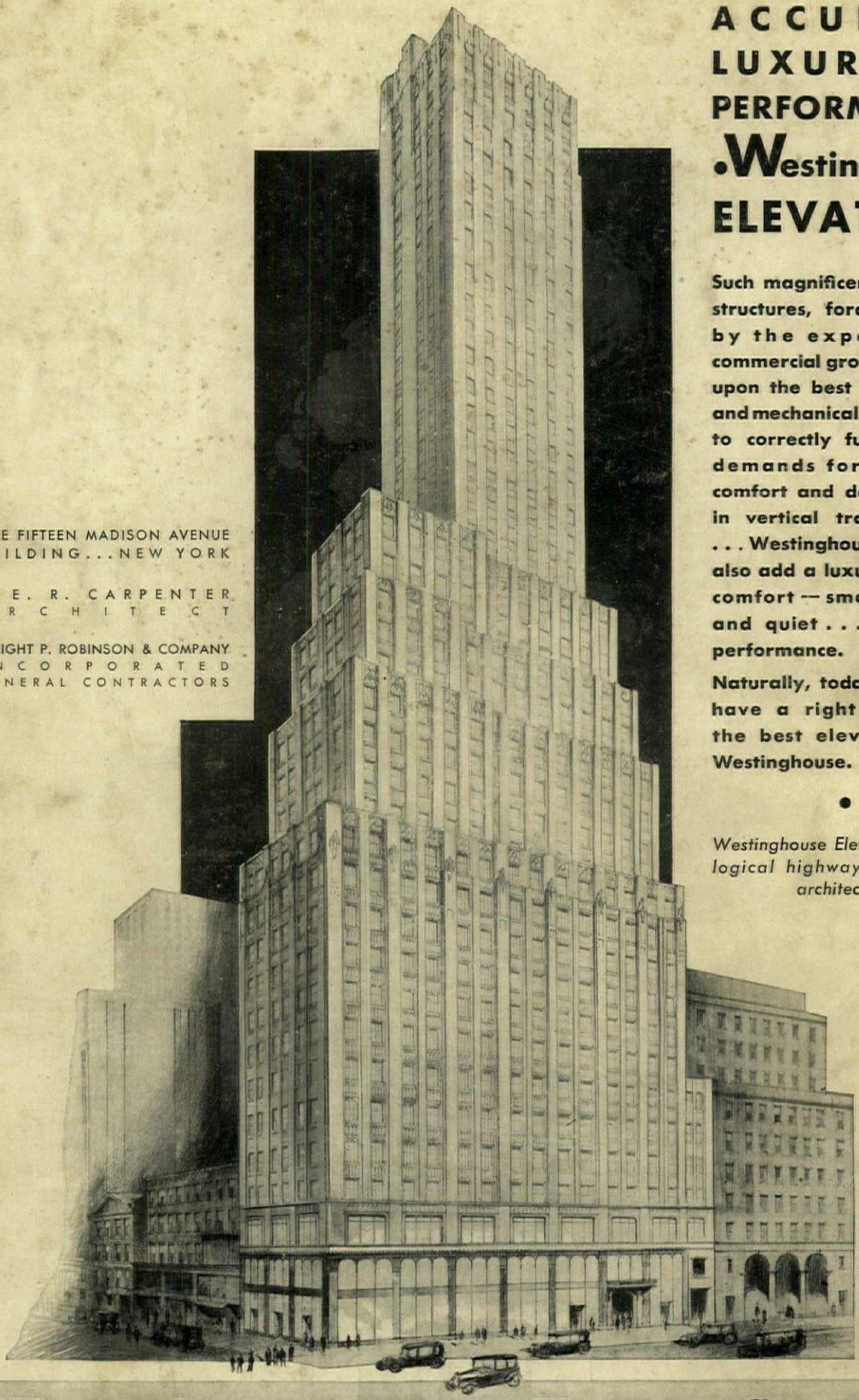
GENERAL CONTRACTORS



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WESTINGHOUSE ELECTRIC
ELEVATORS

Westinghouse Electric Elevator Company