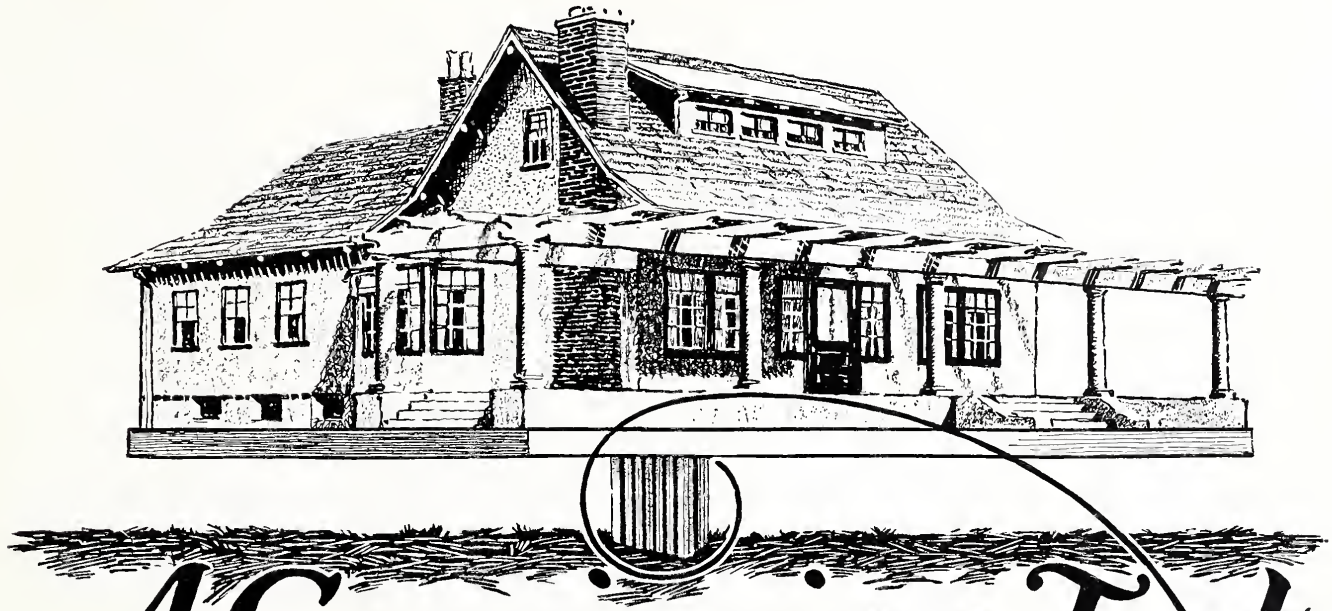
THE ARCHITECTURAL FORUM

JANUARY

1922



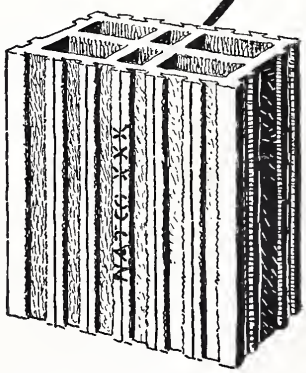
A Convincing Test of NATCO Strength

THE strength of a single NATCO XXX Tile (size 8″ x 12″ x 12″) may be deduced from the result of an endurance test made in the laboratories of Robert W. Hunt & Co., Chicago.

A NATCO Hollow Tile of the above dimensions was placed in a compression machine and the load gradually applied. At the enormous weight of 227,500 pounds continual cracking sounds were heard, but it was not until the gauge read 237,500 pounds that the tile was crushed.

In other words, **one** NATCO Hollow Tile supported a weight decidedly greater than that of an ordinary bungalow and proved beyond doubt its unequaled merit as a building material not only for homes but also for Apartment Houses, Schools, Hospitals, Theaters, Garages, Stables, Factories, Stores, Churches, Club Houses, Hotels and Farm Buildings.

A printed sheet, giving this interesting test in detail, will be furnished to anyone requesting it.



NATIONAL FIRE PROOFING COMPANY

1403 Fulton Building **Pittsburgh, Pa.**

Consolidated Dark Hollow Indiana Limestone Selected For New Federal Reserve Bank Buildings

The Federal Reserve Bank Building at Dallas, Texas, was one of the first to be completed. For its construction, Architects Graham, Anderson, Probst and White, of Chicago, selected Dark Hollow Variegated Indiana Limestone from the quarries of The Consolidated Stone Company, Bedford, Ind.

The Federal Reserve Bank Building at Chicago, recently completed, is indeed a structural masterpiece and one of the finest stone jobs in Chicago. After making an inspection of the quarries in the Indiana Limestone District, Architects Graham, Anderson, Probst and White again selected Consolidated Dark Hollow Stone.

The New Federal Reserve Bank Building, Chicago
Graham, Anderson, Probst & White, Architects

And after inspection of the limestone quarries, Architects York & Sawyer, New York City, have made the following selection for the Federal Reserve Bank Building in that city: "All of the stone for the five lower stories must be Consolidated Dark Hollow Variegated Indiana Limestone."

It is a noteworthy fact that the Dark Hollow Quarry of The Consolidated Stone Company has been in continuous operation for fifty years, and the demand for this natural stone is ever increasing.

An attractive Indiana Limestone card tray will be sent free to architects upon request

THE CONSOLIDATED STONE COMPANY

Box 203, Bedford, Indiana

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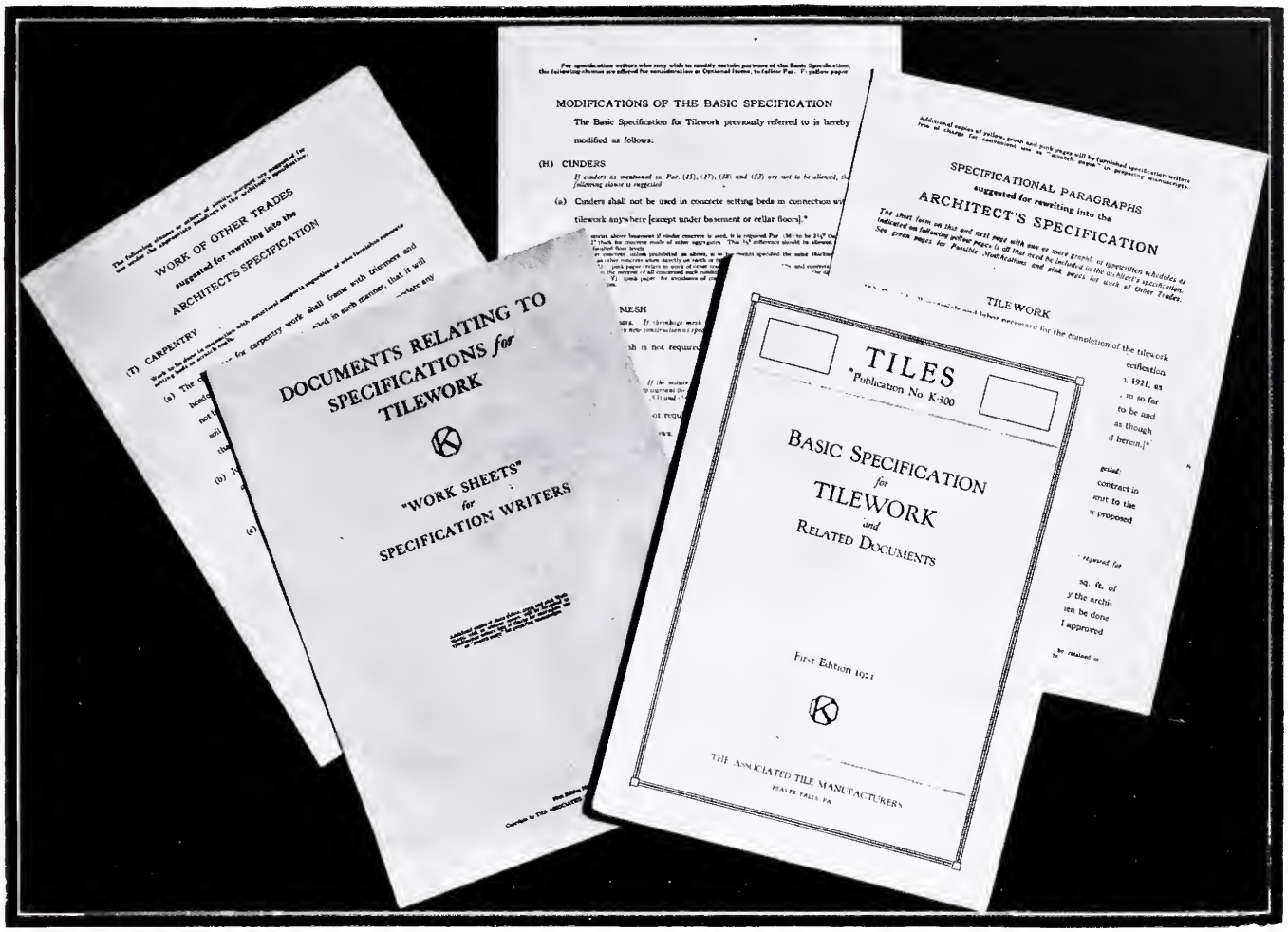
Michael Cohen & Co., 8 West 40th Street..... New York City
J. W. Ward, 1047 Marquette Building..... Chicago, Ill
G. W. Muir ..... Fort Washington, Pa.
George W. Houlsby, 1047 Marquette Building..... Chicago, Ill.
Martin Brick Co., Empire Building..... Pittsburgh, Pa.
R. E. Farley, 417 Stevens Building..... Detroit, Mich.
J. Blackburn, Dixon Hotel..... Kansas City, Mo.
A. W. Steward, Builders' Exchange..... Toronto, Ont.
E. E. Dickinson..... Bedford, Ind.



"BASIC SPECIFICATIONS"

and Related Documents

OUR publication K300 is a basic document designed to serve as a record to which architects may refer in preparing specifications for tile.

Documents relating to this publication, all available to the architect, include:

Modifications of the Basic Specification, paragraphs relating to tile details that must be taken care of for the work of other trades, and specificational paragraphs for rewriting in the architect's own specifications.

Copies of these documents will be sent to architects on request.

The Associated Tile Manufacturers
Beaver Falls, Pa.

St. Elizabeth's Hospital, LaFayette, Ind. 30,000 lineal feet Pyrobar Floor Tile used.
Architects: D. X. Murphy & Bro., Louisville, Ky. Contractor: A. E. Kemmer, LaFayette, Ind.

For Long Span Floors

In hospitals, hotels, office buildings, schools, and other structures, where light floor loads are involved, Pyrobar Floor Tile in conjunction with concrete joists permit the use of long spans, because the light weight of Pyrobar Floor Tile reduces the dead load to a minimum.

U.S. PYROBAR FLOOR TILE

are made of "Structolite," a dense, specially prepared gypsum. By using joist facers, a uniform plastering base of gypsum is obtained on the under side of the floor, avoiding the necessity for suspended ceilings, or lathing.

Pyrobar Floor Tile are efficient sound deadeners, making this construction particularly desirable for use in hospitals and schools.

Our Engineering Department is organized to co-operate with architects in designing floor systems. Send us your floor plans and we will submit a Pyrobar floor design with estimate of cost.

UNITED STATES GYPSUM COMPANY

World's Largest Producers of Gypsum Products

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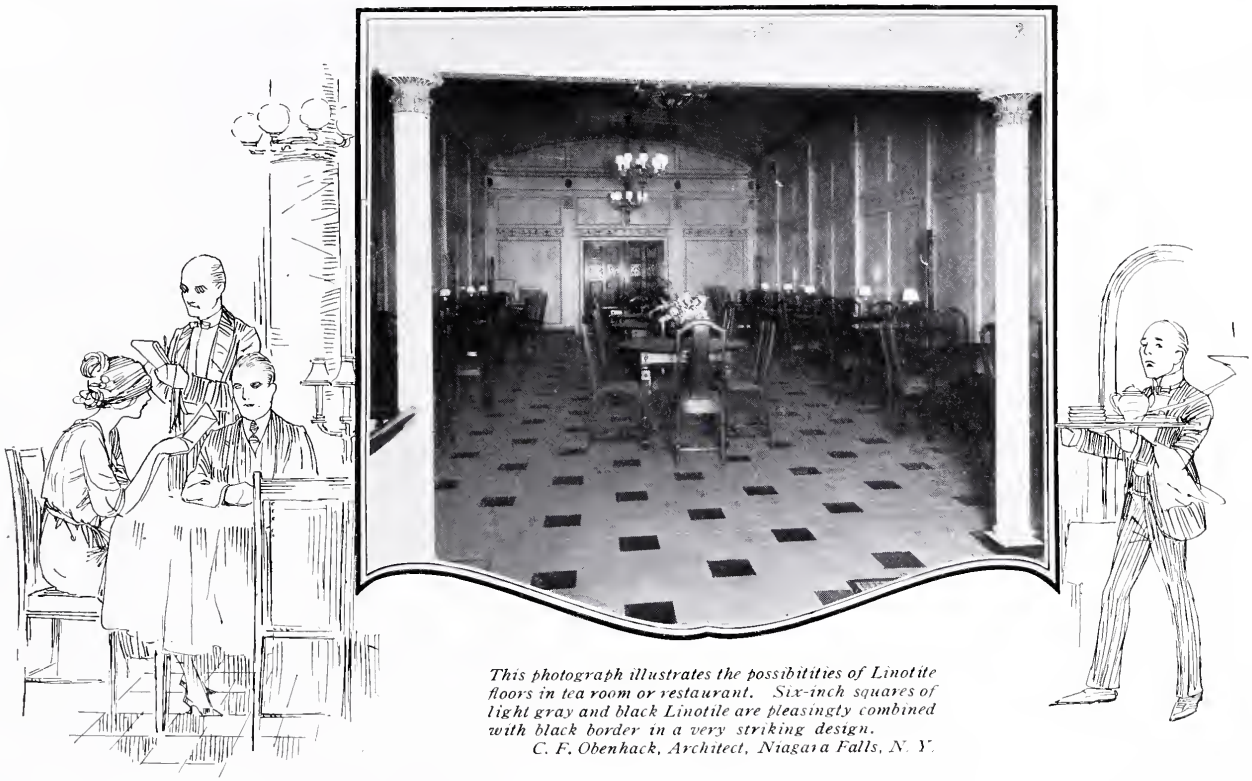
New York, N. Y., Buffalo, N. Y., Boston, Massachusetts, Washington, D. C., Philadelphia, Pennsylvania, Pittsburgh, Pennsylvania, Cleveland, Ohio, Cincinnati, Ohio, Detroit, Mich., Milwaukee, Wis., Minneapolis, Minn., St. Louis, Mo., Kansas City, Mo., Omaha, Neb., Denver, Colo., Los Angeles, California

MINES AND MILLS

Oakfield, N. Y., Plasterco, Va., Cleveland, Ohio, Gypsum, Ohio, Genoa, Ohio, Detroit, Michigan, Alabaster, Mich., Grand Rapids, Michigan, Milwaukee, Wis., Fort Dodge, Iowa, Blue Rapids, Kansas, Southard, Okla., Eldorado, Okla., Piedmont, S. D., Loveland, Colo., Denver, Colo., Arden, Nev., Amboy, California



This photograph illustrates the possibilities of Linotile floors in tea room or restaurant. Six-inch squares of light gray and black Linotile are pleasingly combined with black border in a very striking design.
C. F. Obenhack, Architect, Niagara Falls, N. Y.

Featuring the Floor with Linotile

LINOTILE in tea rooms and restaurants enhances the dignity and charm that attract discriminating patronage. A floor of character—in itself a distinctive decorative feature — Linotile gives individuality to the room in which it is laid.

Linotile is a cork composition, made in tiles of various shapes and many sizes and in eleven pleasing colors. Laid piece by piece in an almost unlimited variety of combinations, Linotile floors conform to areas of any size or shape, harmonize with any architectural treatment and afford unusual scope for originality in design.

Other features equally desirable are resilience and comfort underfoot, non-slipperiness and quietness. Non-absorbent and without cracks or crevices, Linotile floors are easily cleaned and kept clean. And not the least of their unusual properties is their remarkable durability.

Write for a sample and a copy of the 44-page book, "Linotile Floors," which is illustrated in color and contains complete information and specifications. They are sent free on request.

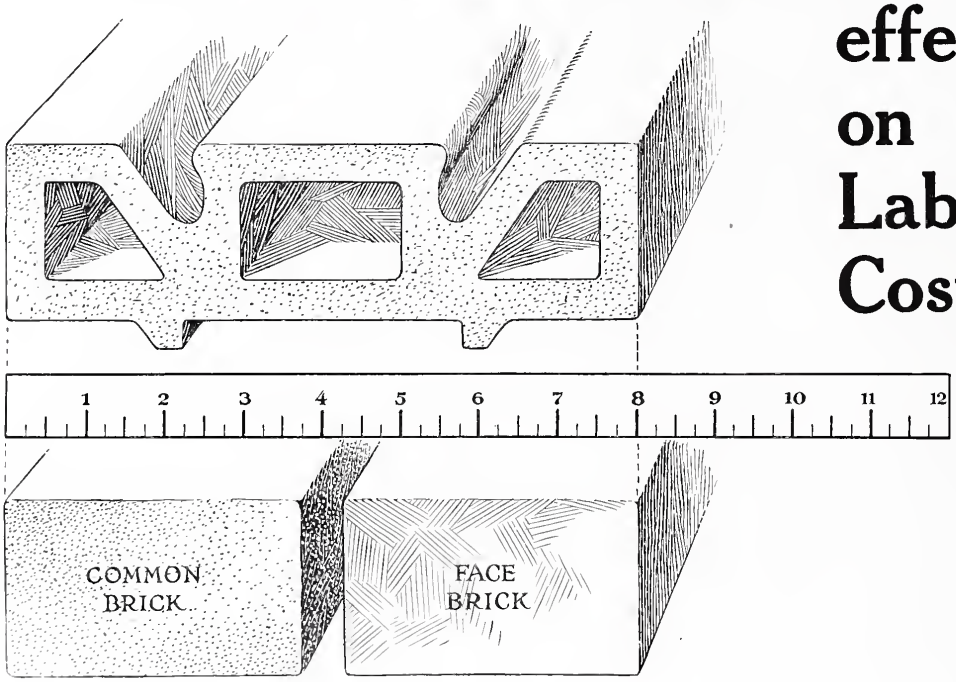
Armstrong Cork & Insulation Company
132 Twenty-fourth Street - - - Pittsburgh, Pa.

Also manufacturers of Armstrong's Cork Tile

LINOTILE FLOORS

Size of Building Units—

effect on Labor Costs



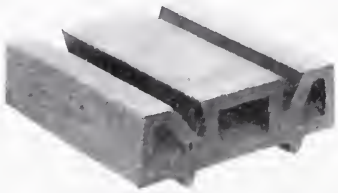
Nearly one-half the labor cost of a brick wall is due to the backing of common brick.

This is saved by making face brick 8 inches wide instead of 3¾ inches, thereby eliminating the handling of about half the units.

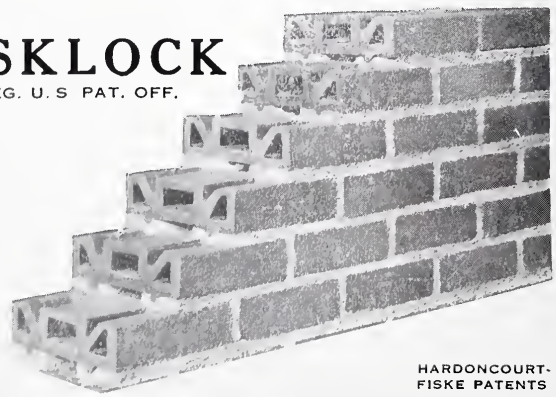
"Fisklock" is a face brick 8 inches wide.

It forms an 8-inch wall by itself. Each unit is equivalent to a face brick and a common brick, yet it has the standard 8 by 2¼-inch face; it is as easily handled as a common brick because it weighs but little more and has the 4-inch hand hold to which the mason is accustomed.

And a "Fisklock" house is a beautiful brick house; it is fire-proof, with a minimum expense for up-keep. It is proof of the architect's appreciation of beauty and his practical weighing of values.



FISKLOCK
REG. U. S PAT. OFF.



FISKE & COMPANY
Incorporated
Boston, Mass.
New York Watsontown, Pa.
Tapestry Brick
REG. U S PAT OFF.

HARDONCOURT-FISKE PATENTS

Entrance, Industrial School of Arts, Trenton N.J. Cass Gilbert, Architect

A very effective employment of simple soldier and rowlock courses for the embellishment of the wall surface. Note especially the treatment of the broad belt course at the second story.

A Portfolio of Architectural Details in Brickwork

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

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

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

AMERICAN FACE BRICK ASSOCIATION

1151 WESTMINSTER BUILDING • CHICAGO, ILLINOIS

Reds, Browns Tans and Buffs

— 16 Variations

Stippled Cloister Brick:

These are our regular Cloisters, now made with a stippled texture. Five beautiful shades ranging from a bright red to a warm dark brown, with subtile variations of tones in the individual brick — the result of special treatment in burning.

Doric Stippled Brick:

The Dorics offer six unusual shades of buffs and tans, running from a delicate buff with a pinkish cast, through olive buffs, golden tans and rich browns to deep purplish browns and black.

Gothic Stippled Brick:

The Gothic stipples comprise five very desirable shades of rich browns and reds. They range from a dark brown or black, through lighter browns and reds to a wonderful old rose shade.

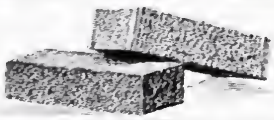
Finely illustrated booklets describing these three types of Stippled Brick will be sent on request. Address Dept. 11.

The Double Purpose of Stippled Texture

THE distinctive markings on the faces of Stippled Brick serve a double purpose. They give an original and inimitable character to the brick. And because of their shape, they act similarly to prism glass in softening and diffusing light, as is necessary to bring out the life and the true beauty of the brick colors.

The slight incisions produce an ideal texture; a surface not smooth enough to be monotonous, still not rough enough to be garish. Stippled Brick represent the happy medium, expressive of good taste and refinement.

STIPPLED BRICK



Western Brick Company
Capacity One Hundred Million Annually
Danville, Illinois

Economical Construction

A Department of Practical Information

2nd YEAR JANUARY 1922 *Edited by* William Carver, *Architect*

Ideal Walls are Economical and Satisfactory say Users

Architects, Engineers and Contractors Prove by Actual Experience that Ideal Construction Justifies Favorable Claims

Frank C. Vitson, Mechanical Engineer, San Francisco, says:

"The idea of the Ideal Wall is the finest thing that has come to lovers of brick construction in years. Now we can have our long wished for brickwork at the cost of frame construction.

"I have tried it out thoroughly merely to satisfy myself and now that the trial is over am more of an enthusiast."

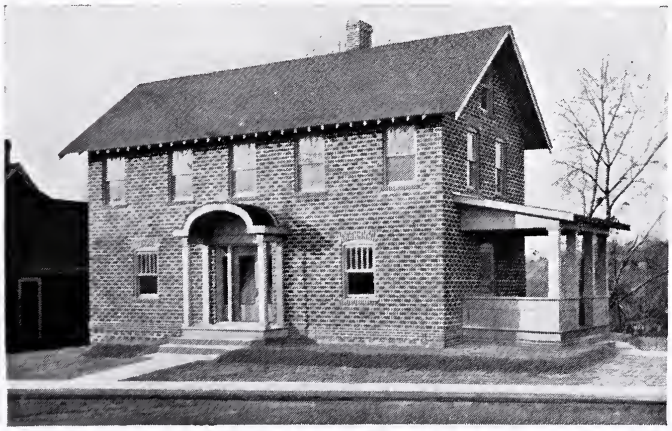
The foregoing is typical of numerous letters of endorsement constantly being received from all parts of the country.

Economical—cutting ⅓ from brickwork cost—beautiful, dry and satisfactory in every way, the Ideal wall gains friends wherever used. It has all the advantages of solid and hollow construction for residential buildings, at a cost lower than any other type of construction, not even excluding frame.

Soundly Built Permanent Homes Better Investment for Clients

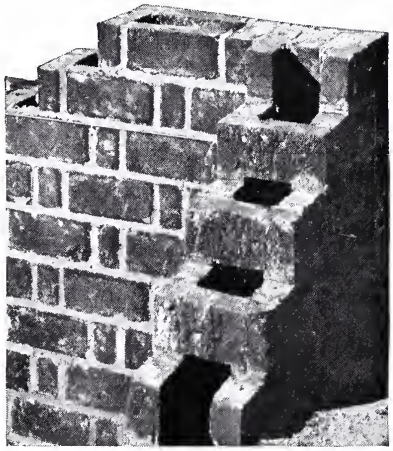
Not only is Ideal construction satisfactory to the architect but it brings enduring satisfaction to owners. The public is now well aware that when buying an automobile the first cost is not the only cost and is now learning this truth with respect to houses. Nonpermanent construction implies constant tinkering and expensive hand labor in making repairs—which are not only annoying but costly. Permanent brick construction requires little or no repair.

The U. S. Bureau of Internal Revenue allows a "life" of twenty-five years on frame building in figuring real estate items in income tax returns. Therefore, for a frame house costing $10,000, there should be set aside each year, $400 to cover obsolescence, this being in addition to the annual expense of painting and repairs.



Ideal Wall home at Alton, Ill.

The Ideal wall combines all the advantages of solid brick construction—for the cost of frame.

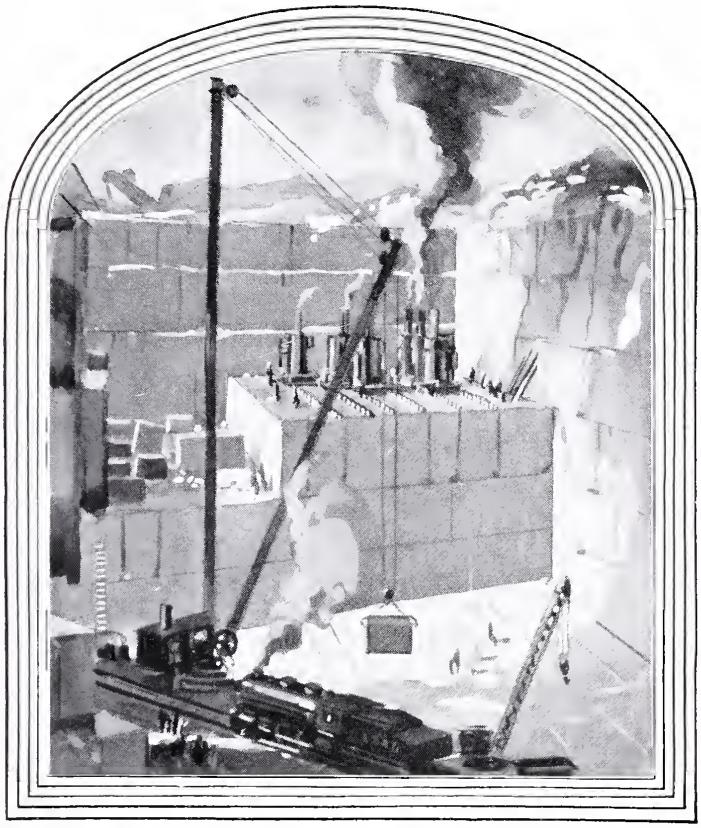


An 8-inch Ideal All-Rolok Brick Wall section.

Architects Find This Brick Manual of Great Value

For 25 cents only, we will gladly send this 72-page construction manual —"Brick, How to Build and Estimate." Some of the subjects covered are: The Ideal wall, brick in fire-resistive and slow burning construction; brick in fire and party walls; compressive strength of brick; fire-resistiveness of column coverings; cement and limes; sand; mortar; colors; selection and preparation of mortar; bonds; joints; fireplaces and chimneys; brick construction in freezing weather; and many other topics. If your local brick manufacturer cannot supply you, write The Common Brick Industry of America, 1309 Schofield Building, Cleveland, Ohio.

For data on Ideal wall and other information on brick, see Sweet's Catalog, 1921, pages 107-114.



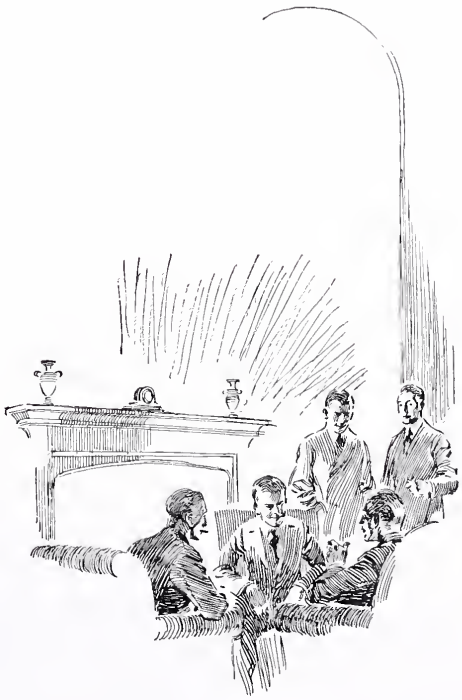
To Architects and the Stone Trade—

On the dawn of this New Year we desire to express our appreciation of your interest and patronage accorded us during Nineteen Hundred Twenty One.

In anticipation of a large volume of business this year, we extend to you a cordial invitation to visit Bedford, for we believe that an inspection of the home of Indiana Limestone, this vast natural stone deposit and the development of the quarries, will undoubtedly prove of great interest and advantage to you.

During your stay in Bedford, we are pleased to offer you the convenience and courtesies of The Bedford Stone Club, where you will find a friendly hearth and genial hospitality always.

Indiana Limestone Quarrymen's Association
Box 766, Bedford, Indiana



VISIBILITY

is an outstanding feature of a garage designed with a d'Humy Motoramp

View from Point A

When the motorist reaches the ramp, after entering the building, he has a splendid view of the floor above because of the open construction and because his eyes are almost on a level with the next floor.

View from Point B

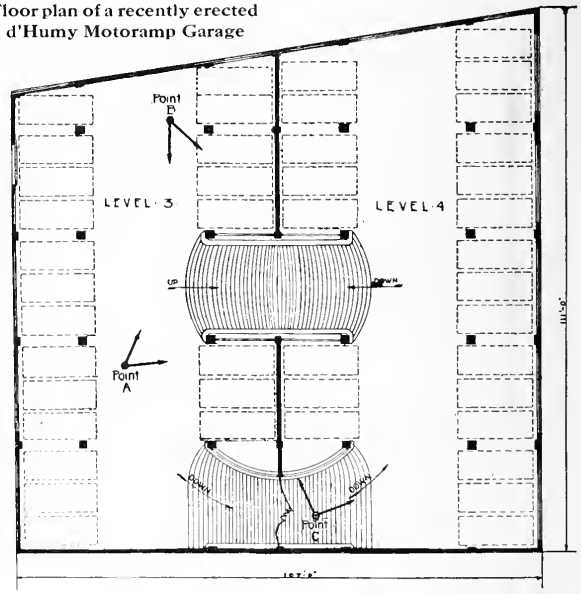
This picture clearly illustrates the advantages of the d'Humy Motoramp. The ramps are short, the grades easy, and the open construction eliminates blind corners and dark pockets.

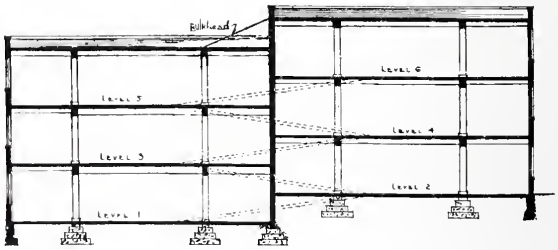
View from Point C

As soon as the motorist has passed halfway up or down the ramp he can see a full floor and half of the next ramp. If another motorist is coming in the opposite direction they see each other in time to pass on the broad aisle without difficulty.

TAKE a trip through such a building—you will be pleasantly surprised to find that it is a safe and convenient garage because of the maximum visibility it affords the motorist.

Floor plan of a recently erected d'Humy Motoramp Garage





Extreme visibility obtains because d'Humy Motoramps are half the length of ordinary ramps and are not boxed in.

The d'Humy Motoramp is a patented system of building design involving a combination of ramps with staggered floor levels (the building being divided into two units) and applicable to multi-floor garages, service buildings, factories and warehouses.

Details will be gladly furnished interested architects

Ramp Buildings Corporation

115 Broad Street - - New York

The Extra Long Plug

A marked improvement in electrical equipment that will find a wide variety of uses.

A convenience plug

ITS UNUSUAL length provides a solution to the problem of connecting an electrical appliance to a socket equipped with a glass shade.

Maximum efficiency and ready sales will be obtained for appliances equipped with this plug, because its merits will instantly be recognized by anyone who has had occasion to use a short plug.

A new development in the line of Arrow Standard Interchangeable Plugs and Receptacles.

THE ARROW ELECTRIC CO.
HARTFORD, CONN.

ELECTRICAL ARROW WIRING DEVICES

ARROW

The complete line of Wiring Devices

The roofing problem of this building has been solved

HERE the architect solved the roofing problem by specifying Johns-Manville Asbestos Roofing. He answered the upkeep question by specifying a roofing that will not decay, dry up, crack, curl, "run" or disintegrate. He answered the question of fire hazard by specifying a roofing that is fire-safe.

Asbestos Roofing, being all mineral, is subject to none of the inherent defects found in so-called "rag felt" roofings.

Johns-Manville Asbestos roofing is made in a wide range of thicknesses and forms, including the beautiful "Colorblende" Asbestos Shingles.

There are facts of value and interest to every architect in the Johns-Manville Roofing Booklet. Sent promptly upon request.

Johns-Manville Asbestos Roofings are approved by Underwriters' Laboratories, Inc.

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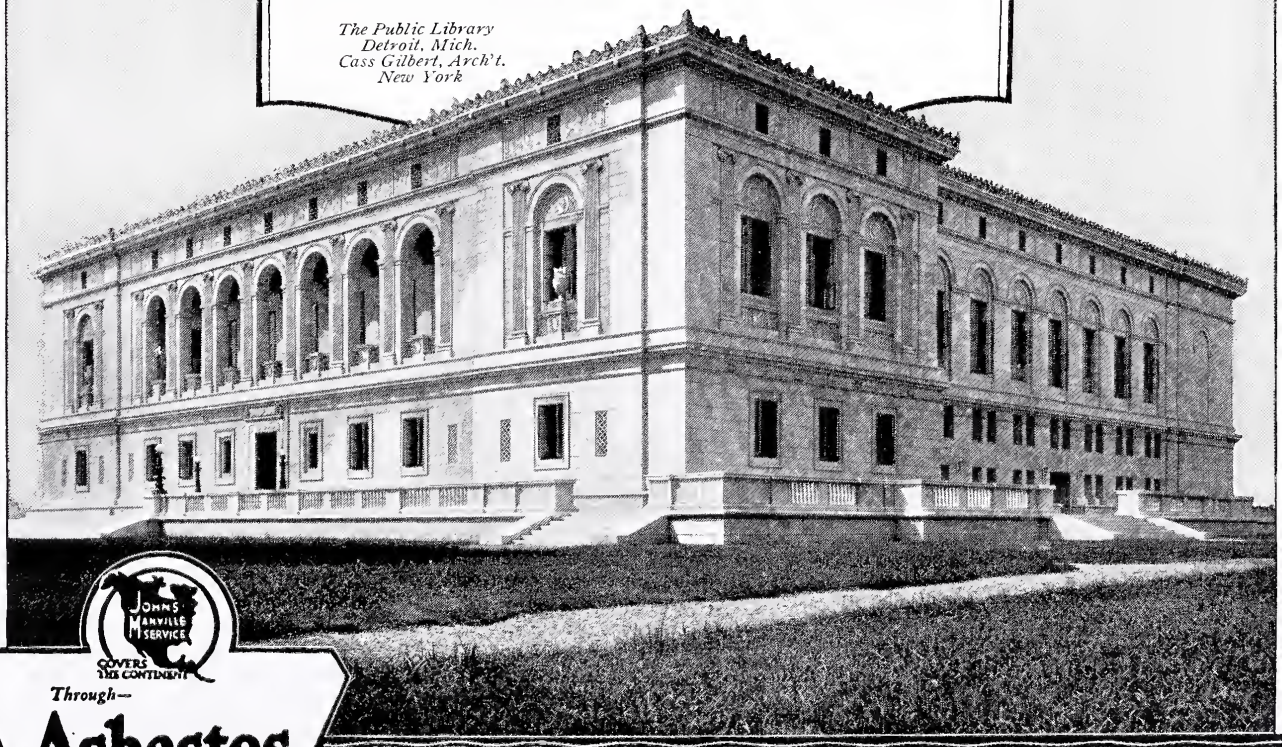

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JOHNS-MANVILLE
ASBESTOS ROOFING

THE ARCHITECTURAL FORUM

VOLUME XXXVI NUMBER 1

CONTENTS for JANUARY 1922

PLATE ILLUSTRATIONS

LETTERPRESS

ALBERT J. MacDONALD, Editor

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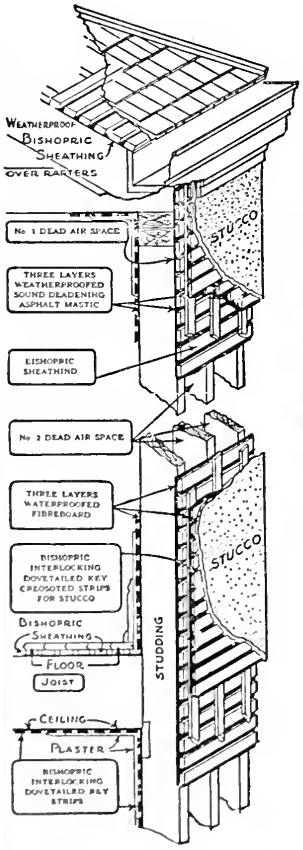
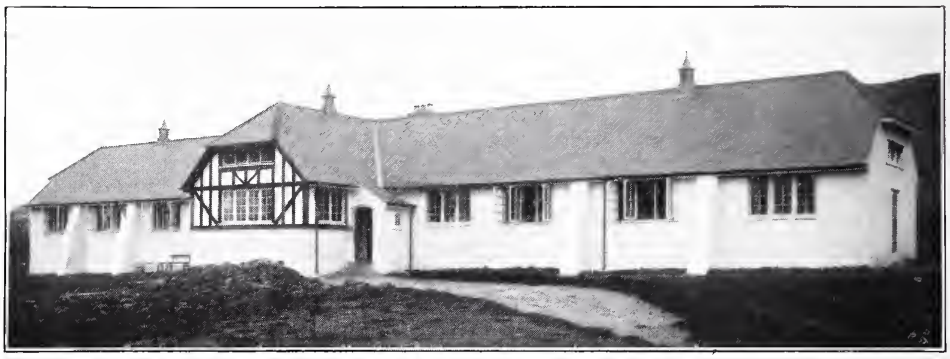
Albert J. MacDonald, Pres. and Treas., S. Howard Myers, Vice-pres., Robert Sweet, Sec.

BISHOPRIC

In England





Standard Workman's Bungalow
Architect, Sir Charles T. Ruthen, Director General of Housing for Great Britain. Contractor, W. K. Jones, Swansea, South Wales. Bishopric Stucco Base used on all exteriors

IN deciding on the materials to use in your building we wish to direct your attention to the following essential factors:

(a) Cost
(b) Speed of construction
(c) Weatherproof qualities—insulation
(d) Strength
(e) Maintenance cost

BISHOPRIC materials will combat most effectively the problems in which these factors are involved.

Build of Stucco—over Bishopric Base—the most beautiful, enduring, economical exterior wall finish known to building science.

THE DOVETAILED KEY
INTERLOCKS THE PLASTER
BISHOPRIC
STUCCO AND PLASTER
BASE

FOR DETAILS & SPECIFICATIONS
SEE SIXTEENTH EDITION
SWEETS CATATOG
PAGES 297-313
INCLUSIVE

We have prepared "Bishopric For All Time and Clime," a booklet for you, containing facts and figures, and illustrated with photographs of beautiful houses built with Bishopric stucco, plaster and sheathing units. Ask for it.

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103 Este Avenue Cincinnati, Ohio

Factories: Cincinnati, Ohio, and Ottawa, Canada
New York City Office: 2848 Grand Central Terminal

THE EDITOR'S FORUM

PRIZES OF ROME IN ARCHITECTURE, SCULPTURE AND PAINTING

THE American Academy in Rome announces its annual competitions for fellowships in architecture, sculpture and painting. They are each for a term of three years, with a stipend of $3,000 for travel. Studio and residence at the Academy are provided free of charge and board is given at cost. The competitions, which will be held in various institutions throughout the country and which will probably begin in late March or early April, are open to all unmarried men, citizens of the United States. Entries will be received until March 1. Anyone interested should apply for detailed circular information and application blank to Roscoe Guernsey, Executive Secretary, American Academy in Rome, 101 Park avenue, New York.

AMERICAN ARCHITECTURE THROUGH ENGLISH EYES

THE various English architectural publications which come to our office frequently gratify us by their frankly expressed appreciation of work being done in America. Apropos of an exhibition of photographs and sketches of American architecture recently opened in London, the *Journal of the Royal Institute of British Architects* makes these observations:

"If Paris gives the finest architectural training in the world, it is America that provides the opportunities for practice, without which we should never know the value of that training. For architecture as learned in Paris and practiced in the United States is a very wonderful thing. It is the most alive of all the arts, and considerably the most important, for there is no expression of American life so complete as its architecture. For these reasons the exhibition of American architectural work now open at the galleries of the Institute is of the greatest importance. The selection is confined to buildings erected within the last 20 years, by the leading architects of our time.

"It is well for us to recognize at once that American architects are more successful in the handling of the larger problems of design than we in England. This statement requires no qualification. The frank acceptance of the fact can be only beneficial, for it will lead us to a very careful examination of the work shown in this exhibition, and a reasoned consideration of the qualities by which it is distinguished. The time is opportune for such consideration, for London is being rebuilt, and there is a sense of uneasiness abroad as to the form that our new streets are taking—a misgiving that all is not well. It is good, therefore, that we should turn our minds to the great achievements of America in architecture, so well represented here, and make a few blunt comparisons with conditions in England."

While highly appreciating the praise which our English cousins so freely accord us, and while thankful for the talented architects whose work has earned the praise, we nevertheless understand full well that such would not have been possible had it not been for the training and grounding in architectural design and practice which American students have received from France and England.

CALIFORNIAN ACTIVITIES

THE Stockton Association of Architects has started a campaign to lower the cost of building and has presented a petition to the Building Trades Council and the Building Trades Craftsmen of the city of Stockton, asking a 12½ per cent reduction in all building trades wage scales, to take effect January 1, 1922. They have also taken up the matter of price reductions on those materials which have not shown a sufficient percentage of reduction since the peak. With this in view, the architects have pledged the Association not to specify materials that are held at exorbitant prices where substitutes can be found, and not to specify any material handled by a manufacturer or dealer who is putting exorbitant prices on his products. The matter of illegal combinations of dealers and manufacturers in restraint of trade is also being taken up with the federal authorities. There is also to be held, January 21 to 28, under the auspices of the Association, an architectural and building material exhibit. A comprehensive line of building materials is to be exhibited, showing all new and modern building materials and new and economical methods of building construction and a large exhibit of architectural drawings, photographs and models. The president of the Stockton Association of Architects is Glenn Allen, 37 South Aurora street, Stockton, California.

AN EXHIBITION OF TEXAS WORK

THE first of what is intended to be an annual exhibition of Texas work will be opened by the Dallas Architectural Club at the Jefferson Hotel, beginning February 11 and lasting one week. The exhibition committee invites the submission of examples of work, including photographs of executed work, drawings, renderings, sketches or models which illustrate architecture, sculpture or decoration. All drawings must be framed, mounted or neatly matted; color mats are preferred and exhibits should reach Dallas not later than February 6. The exhibition committee may be addressed at the Jefferson Hotel, Dallas, Texas.

L'ECOLE COMMUNALE, BEAUNE, BURGUNDY
FROM THE PENCIL DRAWING BY HOWARD MOÏSE

The
ARCHITECTURAL
FORUM

VOLUME XXXVI JANUARY 1922 NUMBER 1

Some Ideas on Bank Buildings—Artistic and Practical

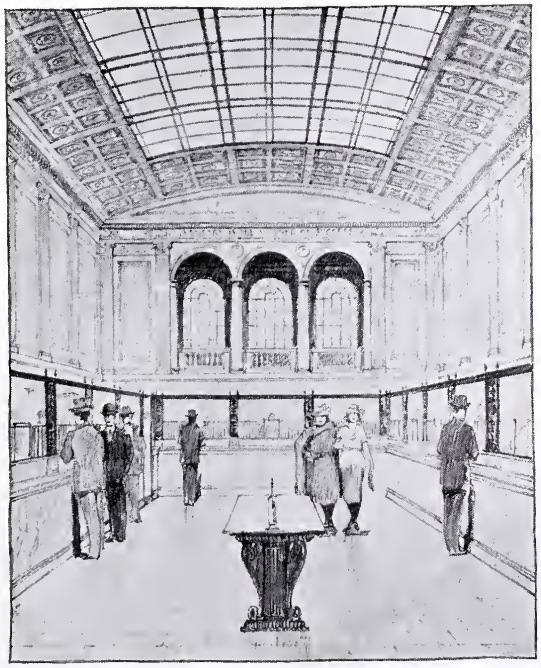
By ALFRED HOPKINS

With illustrations from buildings designed by the author

TO the architect with imagination the possibilities offered by the bank building for noble and appropriate architecture should make an instant appeal. The influence of the bank on the daily life of the community is continually increasing, and it is not too much to say that just as the church stands for the highest ideals in the spiritual life, so the bank seeks to elevate and maintain them in the business and social life of the community. The bank is therefore becoming more and more the place where good counsel may be obtained, where practical help for the sound enterprise is given, and, in the larger institution, where records and information which will assist the business man in maturing his judgment are kept, tabulated and freely distributed. Such in brief is the distinguished position of counselor and friend which the bank has come to occupy in the community. In what way, therefore, should its house be built? The accompanying text and illustrations give some suggestions.

The Bank a Public Institution

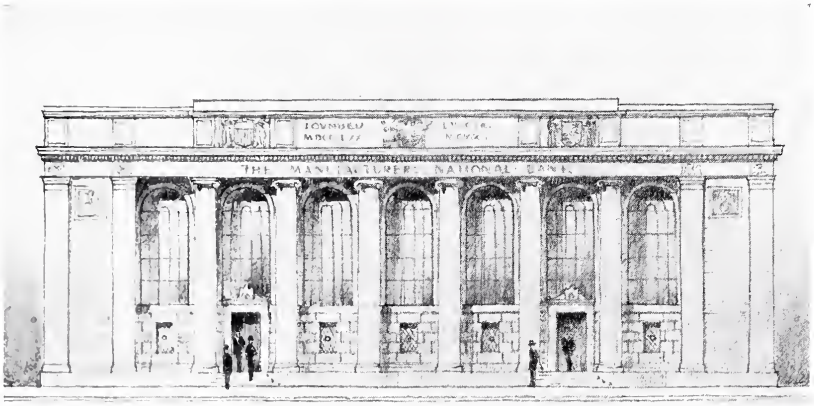
As the bank is a public institution its most appropriate architectural expression is to be found in the classical style, but that does not mean the tasteless iteration and reiteration of pediments, columns, arches and the general jumbling of classical motives with which the commercial bank builders have made us all familiar. Noble architecture is the bank's greatest asset so far as its house is concerned. Taste and refinement should be in its every feature, and it has many features which may be treated originally and appropriately.

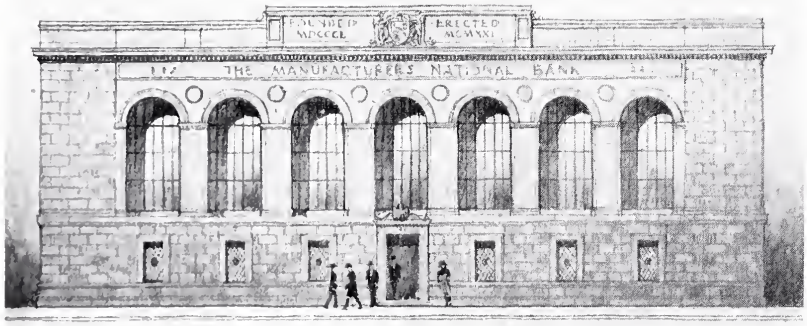


Interior, Commercial Bank and Trust Company Building
Bridgeport, Conn.

Two Types of Buildings

When the time arrives for the bank to take thought of the increased comfort and advantages afforded by a new building there are two types of structure which come to mind,—one the individual home for the bank's exclusive use, and the other a building which shall seem to be primarily the bank's, but with sufficient additional renting space to return a revenue. This latter type at first thought seems to be preferable, but the writer's experience is that banks which build office buildings for their income return sooner or later regret it. In such a building the quarters of the bank, to which it is vitally necessary to give distinction, and particular emphasis, become only incidental. The bank, after all, is but one of many occupants; consequently it is difficult to focus public attention upon it. Then, too, the bank ties up money which ordinarily it can use to better advantage in its own business and embarks on a venture which is foreign to it. Renting office space is not banking, and a bank president to whom was expressed this view thus explained his position: "Having been associated with the National Bank of Commerce and having participated in the erection of its building, I heartily concur in all you have to say with respect to an individual bank office. It certainly gives distinction





Alternative Sketches for Exterior of a Bank in Troy, N. Y.

to an institution and relieves those in charge of a great deal of annoyance, care and responsibility. I found in my old position, that although we had a capable superintendent, the tenants' complaints finally reached me."

This is the expression of a man who had to do with the erection of a 14-story office building. Only where the bank seeks something quite apart from the ordinary relation between landlord and tenant, as when it wishes to have others with it in a reciprocal association of interest, or when the bank is limited in what it may do in reaching out for new business or if the property it owns is very valuable, or when some special condition prevails, would it seem desirable to build other than the individual bank building. In the individual building only is it possible to attain that distinction already referred to and which will be emphasized throughout this article.

Ventilation and Lighting

Where the conditions make it possible, the first thing to change in the usual bank's construction is the indiscriminate use of the overhead skylight. No building so constructed can be considered fireproof. Large skylights are always a hazard, either through the possibilities of fire or accident from adjoining properties or from leaks due to the contraction and expansion of its material exposed to the extremes of temperature from both within and without. Then the best opportunity of the interior for the display of design is in the ceiling, because the view of it is always uninterrupted and the intrusion of the skylight here detracts from the dignity of a purely architectural treatment. Ordinarily a much better method of lighting is to employ the light well, either at the side or at one end, which not only gives light, but what is equally important, ventilation. On these two factors, light and ventilation, hang all the law and the prophets of the architect's bible. A building which fails in these essentials fails irrevocably. A mechanical ventilating plant is usually as poor a substitute for the fresh air which blows in at the window as the electric bulb is for the light of heaven. Consequently a bank situated on an interior lot, with only the front open, should be provided with area lighting and ventilation whether the skylight is used or not, for the chief difficulty in depending entirely upon the skylight is that while it may be made to give light, it is impossible to use it to advantage as a means of obtaining fresh air.

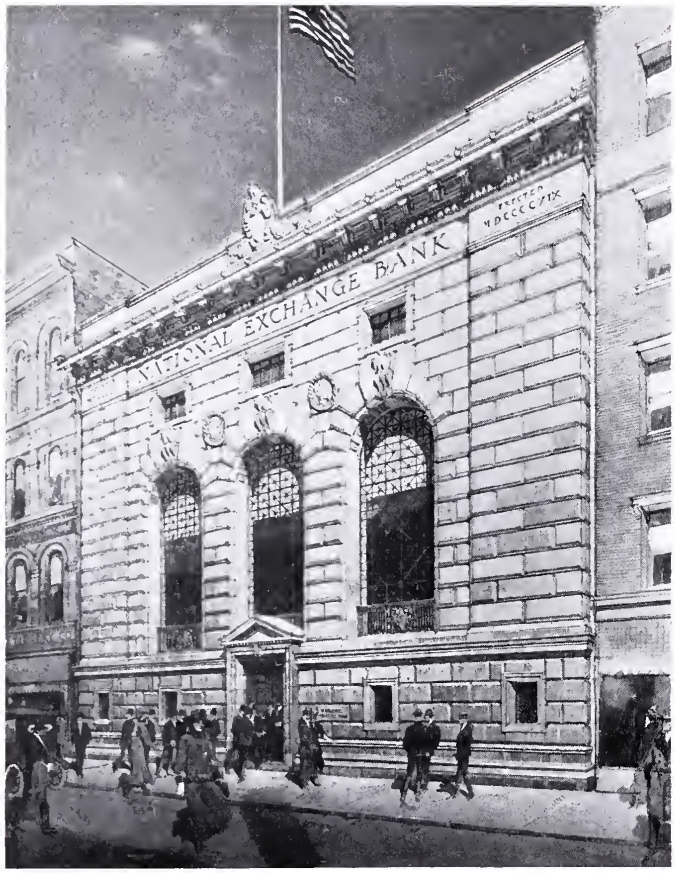
Different Banking Plans Described

With regard to the interior arrangement of the banking plan there are three general possibilities: the so-called "U" plan, the "island" plan, and the "half-island" plan, which leaves the banking screen open on three sides with the fourth against the wall. All of these schemes are useful, but their adoption depends largely upon the needs of individual cases.

The island plan is always convenient for the bank, and especially for the savings bank. The intercommunication between the various departments which it affords is immediate, but on the other hand such an arrangement is always inconvenient to the public. The author knew of one bank which had used the island plan for 40 years, and in its new building it chose the U plan solely on account of the greater convenience it gave to its customers. On the other hand, when this instance was cited to a bank president, who was in the throes of deciding upon the type of plan for his new building, he promptly dismissed the island plan with an equivalent to that classic phrase, "the public be damned." What he wanted to consider solely was the convenience of the bank. In special in-

stances, perhaps not all like that just cited, the island plan may be desirable, but for the usual commercial bank it is better to use either of the other types. These give the public more direct contact with the service which the bank has to offer and by care in the design of their equipment can be made to serve the bank as well as the island plan, and the public better.

The U plan, on the other hand, is always a good arrangement for the public, as it puts all departments within easy view and reach. A central space less than 14 feet in width is not advisable in a busy bank, though ample in the smaller institution where crowded conditions seldom prevail. This brings up the width of the cages. The teller's space can be relatively small if conveniently arranged, a depth of four feet clear floor space, and a width of four feet, six inches between center to center of the tellers' windows are the minimum though satisfactory dimensions for the city bank. Country banks usually desire more room than this because accustomed to it, and there is no reason why they should recede from that position. There are still some advantages left for the country which the city lost long ago, and one of them is space.



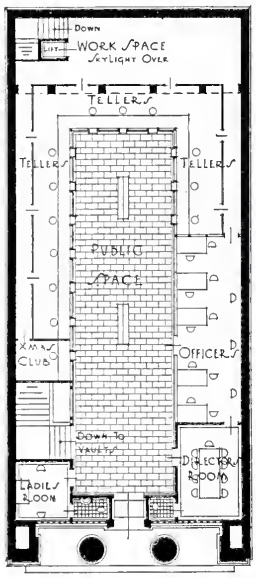
Design for Commercial Bank on Wide Interior Lot in Important City

What has been called the "half-island" plan or, if one wishes to persist in the geographical idiom, the "promontory plan," is a compromise between the two schemes and sometimes, if the lot will permit, it is possible to combine the advantages of both without the difficulties of either. The half-island plan leaves the screen open on three sides, or it may run down one side of the building and across the end, and this arrangement generally obscures the view of the interior less than the other. The plan which gives the effect of the most spacious interior is always the best architecturally and is usually the best from the practical side.

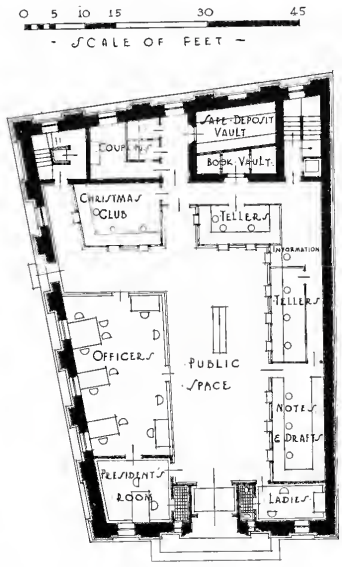
The shape of the plot, or its situation or exposure, is what most frequently determines the plan. It is much better to use one of the types of bank plans which can be worked out naturally and logically with all elements considered—those of convenience for the bank and public, not forgetting consideration for a proper architectural expression—than to try to develop a plan the principles of which fit everything but the lot on which it is to be built.

There is one feature, however, which should be considered in every plan of whatever variety, and that is the possibility of future

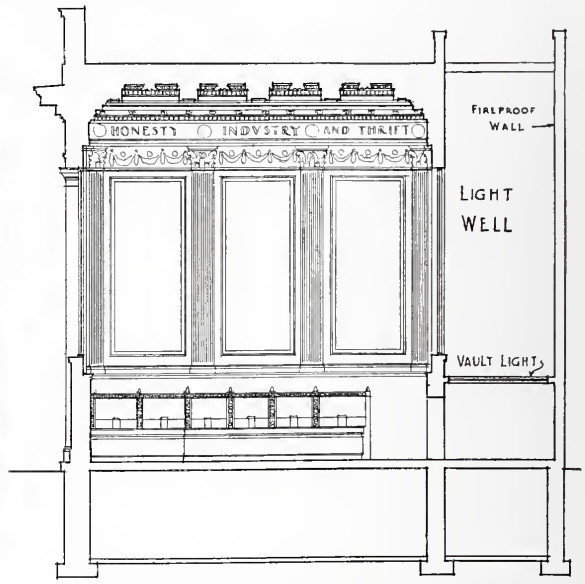
Sketch for a Small Building in Pottsville, Pa.
Showing the value of large, low windows in bank design



U-shaped Plan on Interior Lot; Overhead Light



Half Island Plan Giving Convenience and Good Interior View



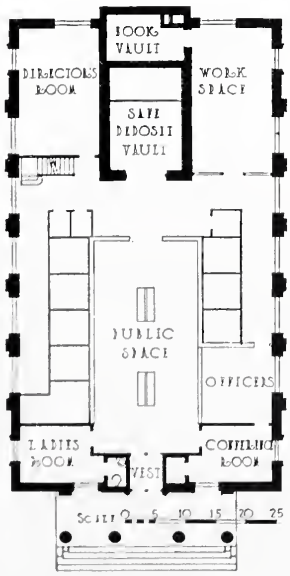
Section Showing Daylighting from Well at Rear of Building Working Space Below

expansion. It is safe to say that no bank was ever built too large, and that it has been the experience of all that the new building is outgrown in half the time expected by the most optimistic member of the building committee. This is a matter now recognized by everyone so that the architect's tentative plan should show a way of increasing the number of wickets and of adding materially to the working space, and the preliminary survey should always take this necessary feature into careful account.

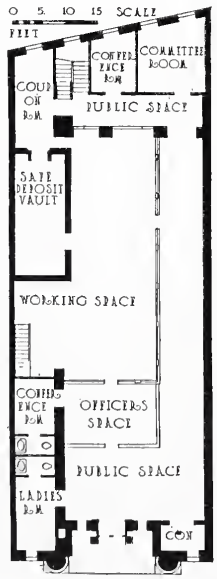
Locations of the Officers and of the Vault

In the discussion of the type of plan there are always two things of importance which come up for consideration: they are the locations assigned to the officers of the bank and to the vault. Since it is slowly coming to be known that the bank is a human institution—which one might take the liberty of suggesting as the chief reason for its increasing prosperity—it is very necessary that its officers be where they are immediately accessible to the public. When they have been for years at the rear of the banking room, as frequently happens in the old buildings, sometimes there is a certain hesitancy about arranging for an officers' space too far forward. Experience proves that, finally, everyone prefers a forward position and indeed for increasing business it is an absolute necessity. The president should always have his own private office and it is frequently desirable that other rooms, in the form of committee rooms or meeting rooms for the public, be provided. An alcove in the public space is always useful where the out of town depositor may make out his slips, sometimes long ones, at a table where he can be seated, while the women's room has now become a necessary accommodation in every banking institution, though it must be confessed this feature is sometimes overemphasized.

The location of the vault is preferably on the main floor and in plain view, but when every foot of space must be utilized there the vault may be put in the basement to advantage. In the busy city bank this is the best place for it. There is no doubt that a fine vault is not only an absolute necessity, but it is a prime factor in increasing public confidence and securing new business. The tendency is clearly to develop it to afford greater security. Heavier linings are being used with doors of proportionate thickness. The processes of manufacturing the different types of steel are continually being improved and steel more and more immune to tool cutting is being perfected. A non-burnable metal has



Typical U-shaped Plan with Light on Both Sides



Half Island Plan on Narrow Interior Lot

Exterior and Interior Views of the Adirondack Trust Company Building Saratoga Springs, New York

been developed and the contents of the modern vaults can now be absolutely protected against three distinct methods of attack—open hearth against explosives, chrome steel against drilling, and non-burnable metal against the cutter burner.

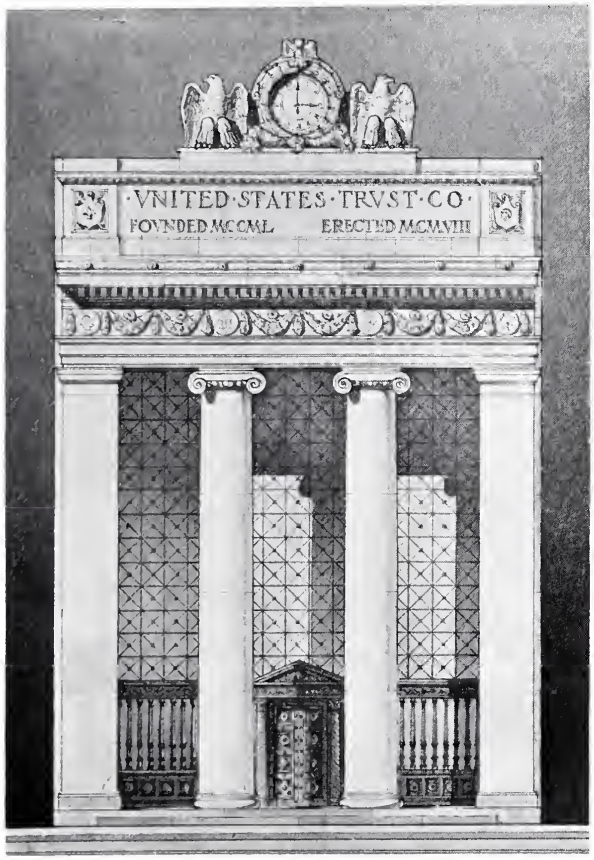
The vault door is a splendid piece of mechanical engineering. Whether it is square or circular is a matter of personal preference. The circular door takes twice as much metal as the square door and requires a larger area in which to swing properly, but mechanically it is a more perfect fit, being ground into its jamb with emery and oil, thus forming its own contact bed. In its advertising value it is always effective and in its security always efficient. The steelwork of the vault is best reinforced by concrete walls in preference to walls of brick, and this preference is more pronounced when the concrete walls are in turn reinforced with bars of tool-proof steel. This makes assurance doubly sure, and the comparatively small additional cost is always a good investment.

The vault may be made large enough so that it contains both the rented safety deposit boxes and the bank's money chests. When this is done the bank's portion is separated from the public spaces by a grille. When, however, separate vaults are provided, one for the public and another for the bank, they are sometimes identical in design in order that they may carry out a uniformity of appearance. There is never any advantage in lining a book vault with metal. All that is ever needed here is protection against fire and this can be had with masonry walls and an adequate fireproof door, and the same thing applies to the vaults for the storage of trunks and silver.

Details of the Banking Floor

The intimate details of the banking floor will be dealt with briefly here, but important to and well worthy the consideration of the busy city bank is the recently developed custom of paying and receiving at the same window. This is more

Design Showing the Value of Brick in Exterior Design, a Material Too Often Neglected in Bank Building



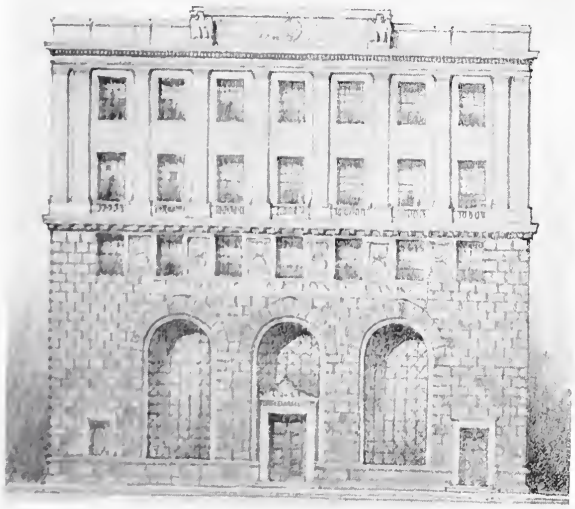
Bank Design for 30-ft. Interior Lot. Architectural Effect through Vertical Emphasis

Savings Bank at Elyria, Ohio, Showing Dignified Treatment on 35-ft. Interior Lot

general on the Pacific coast than elsewhere and seems to have been inaugurated by the First National Bank of Los Angeles, but the custom is now in use by several large city banks.

The improved method is quite simple. In one cage, six feet by nine feet free floor area, there are two windows and two tellers, each of whom receives and pays from the same window. If the area of the working space is sufficient the bookkeepers should adjoin them, this combination making a unit for the drawing account business. Each teller keeps his account independently of the other and each is provided with his own money and key to his side of the money safe in the cage. One teller may borrow money from the other, but he must give a receipt for it.

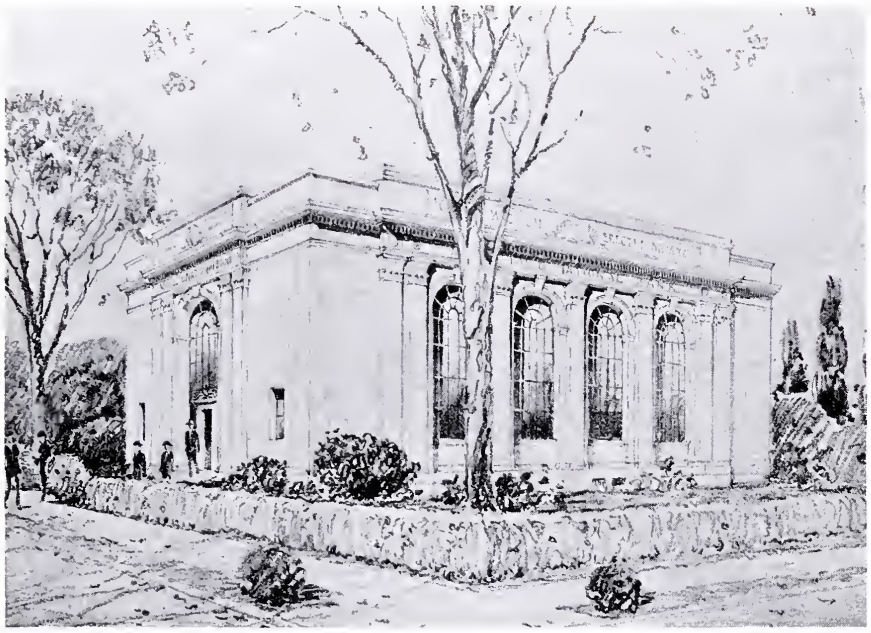
The advantages of paying and receiving at the same window, from the bank's standpoint, are that the tellers have fewer accounts to handle and are consequently much more familiar with them, and the important fact that they work on both sides of the account, paying and receiving, increases that familiarity very materially. The advantage from the public's point of view is a very great increase in accommodation over the usual system; when during some parts of the day the crowd is depositing, with few drawing money, the receiving tellers would be very busy while the paying tellers would be idle. Paying and receiving at the one window make the bank service much more flexible and also promptly equalize any disparity in numbers between those who wish to deposit and those who wish to draw money.



Sketch for a Bank Building in Pennsylvania

It is always important to place the working portion of the bank where it will receive all possible benefits from natural light, where it is necessary to make a choice between natural and artificial light. The

public spaces may very properly be left to artificial lighting. With respect to the bank's equipment, in the larger institution it is always advisable to carry this out on a unit system which greatly facilitates extension in the future. The telautograph, the pneumatic tube and the autophone are all such satisfactory methods of communication that there is little disadvantage in having the clerical force removed from personal contact with the tellers. In the large institution this separation is quite usual, but in the smaller bank, where floor space is always available, the entire work of the bank may well go on behind the screen. This well tried plan should be continued.



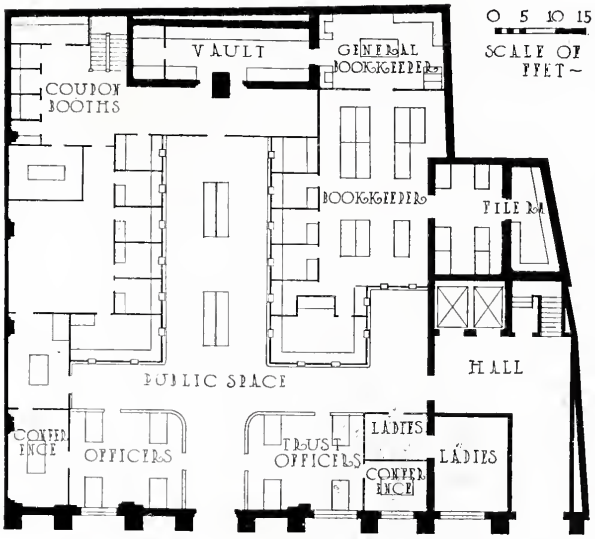
Mt. Kisco National Bank Building, Mt. Kisco, N. Y.

Opportunities for Artistic Treatment

The general practical problems which are considered in the modern bank building have been dealt with briefly, but these in the really successful structure are part and parcel of the architectural scheme. Every detail of the bank is just as responsive to artistic treatment as it is to the latest practical device. The screen offers endless opportunities for originality in its ornamentation. Designs of old coins, of which there are countless varieties, are always appropriate; in the screen of the Adirondack Trust Company, Saratoga Springs, N. Y., pine needles and pine cones are interwoven in the ornament, and in an Ohio bank the buckeye was conventionalized into a flowing and graceful design, together with the outlines of ships denoting commerce, the beaver symbolizing industry, and the winged hourglass and the dollar sign typifying time and interest. Opportunities are endless for appropriate ornamentation, but this should not be overdone, and following out an important architectural principle already expressed, that of giving to the interior the greatest possible effect of space, the screen is best kept light in appearance and as low as practicable. To fill up the bank's interior with the screen is a pernicious architectural error which is frequently made. It is the effect of space which should be emphasized and not those things which may so easily take away from it.

Design for Building on Corner Lot Showing Value of an Attic to Give Solidity to Bank Design

With the interior of spacious effect it is quite possible for the architect to provide things which are worth looking at. It is not at all necessary for the directors to convene behind closed doors, as is usually supposed to be the case. Frequently the directors' meetings take place after banking hours and an open balcony, removed from but

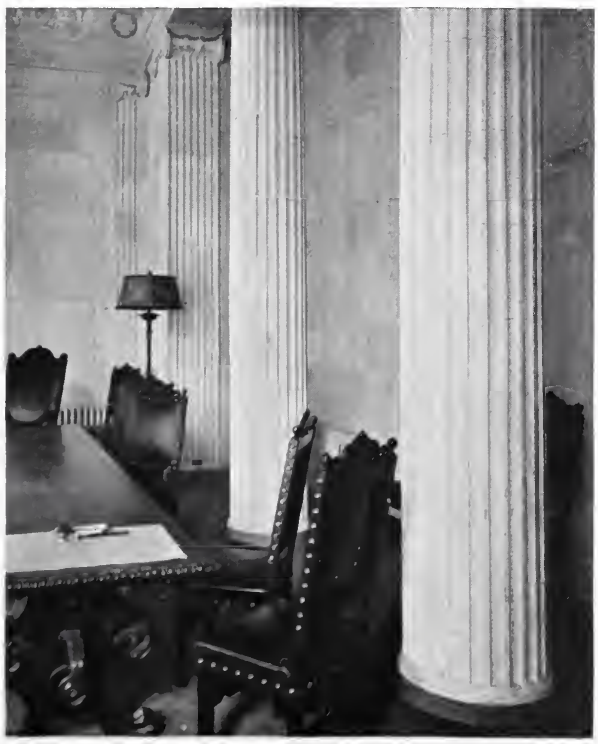


A U-shaped Plan for Building of Large Floor Area

looking down into the main banking room, is an entirely practical place and one which is architecturally attractive. The open directors' balcony in the Adirondack Trust Company has proved entirely satisfactory. A balcony can, and should, be treated architecturally and should certainly be used for a dignified purpose. A very recent and important banking office in New York has two balconies contained within a series of arches which surround the great banking room. These have been used for the clerical force, and the din of the typewriters and the adding machines, deflected to the floor by the arched ceiling, is literally deafening. The bank should not sound like a miniature manufacturing plant, and to prevent this is important.

Instead of the usual cut and dried ornament in the frieze it seems proper and appropriate that fitting inscriptions be placed here. George Washington said: "Economy makes happy homes and sound nations. Instil it deep;" and Abraham Lincoln said: "Teach economy. This is one of the first and highest virtues. It begins with saving money." Both these names and characters have a strong popular appeal. Among other expressions of good advice which the author has used for this purpose are: "Saving is a greater art than earning;" "A penny saved is a pound earned;" "Diligence is the parent of Fortune;" "Frugality is the mother of the virtues;" "The first years of a man should prepare for the last." This latter maxim is perhaps the most direct and clear cut of all, and how few of us realize the importance of it! It ought to be engraved in the back of every man's mind, and it is good business for the bank to help put it there.

So it is seen that all functions of the bank may find their proper and beautiful expression in architecture, whether they be related to those things which are needed for a practical purpose or to that position of prestige and influence which the bank should occupy in its community, and it was just this which the writer meant when he wrote: "To the architect with imagination the possibilities offered by the bank building for noble and appropriate architecture should make an instant appeal."



A Simple and Dignified Treatment for a Board of Directors' Room

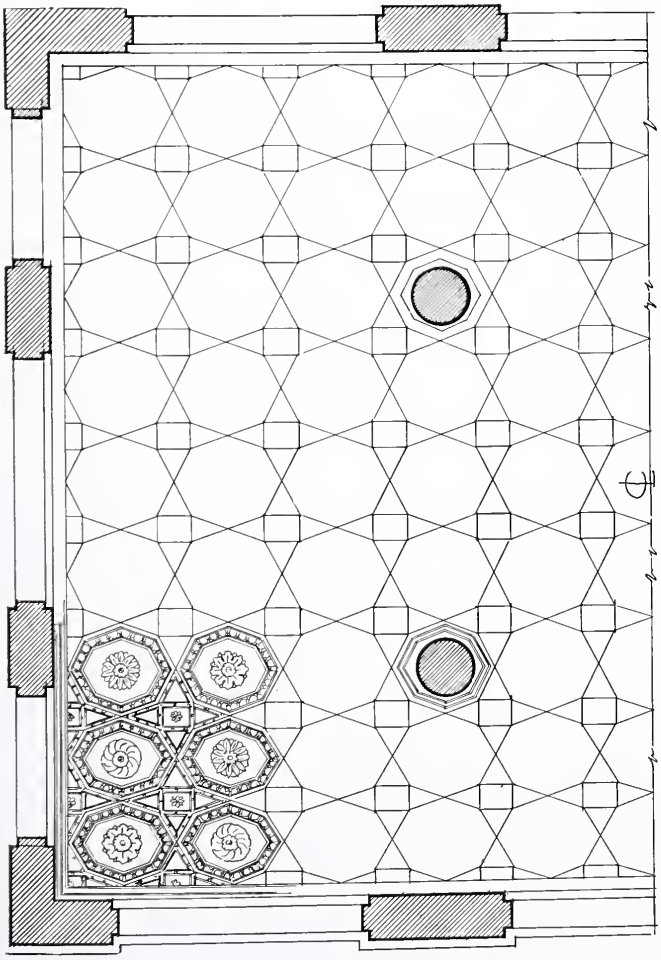
Corner in the Ladies' Room in Adirondack Trust Company Building

VIEW LOOKING TOWARD ENTRANCE

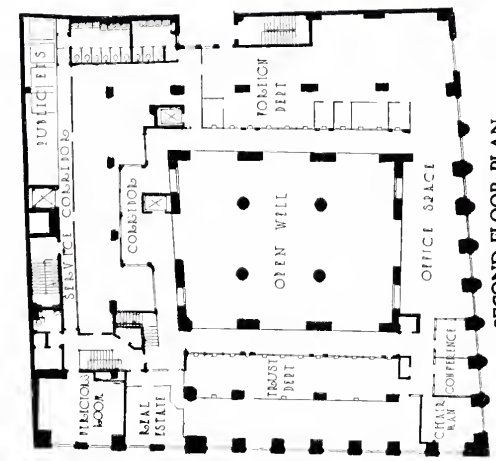
BANKING ROOM, NEW YORK TRUST COMPANY, NEW YORK

WALKER & GILLETTE, ARCHITECTS

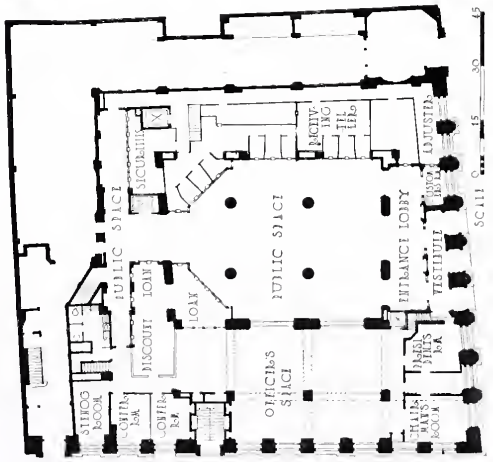
VIEW TOWARD PAYING TELLER'S CAGE



HALF PLAN OF MAIN CEILING



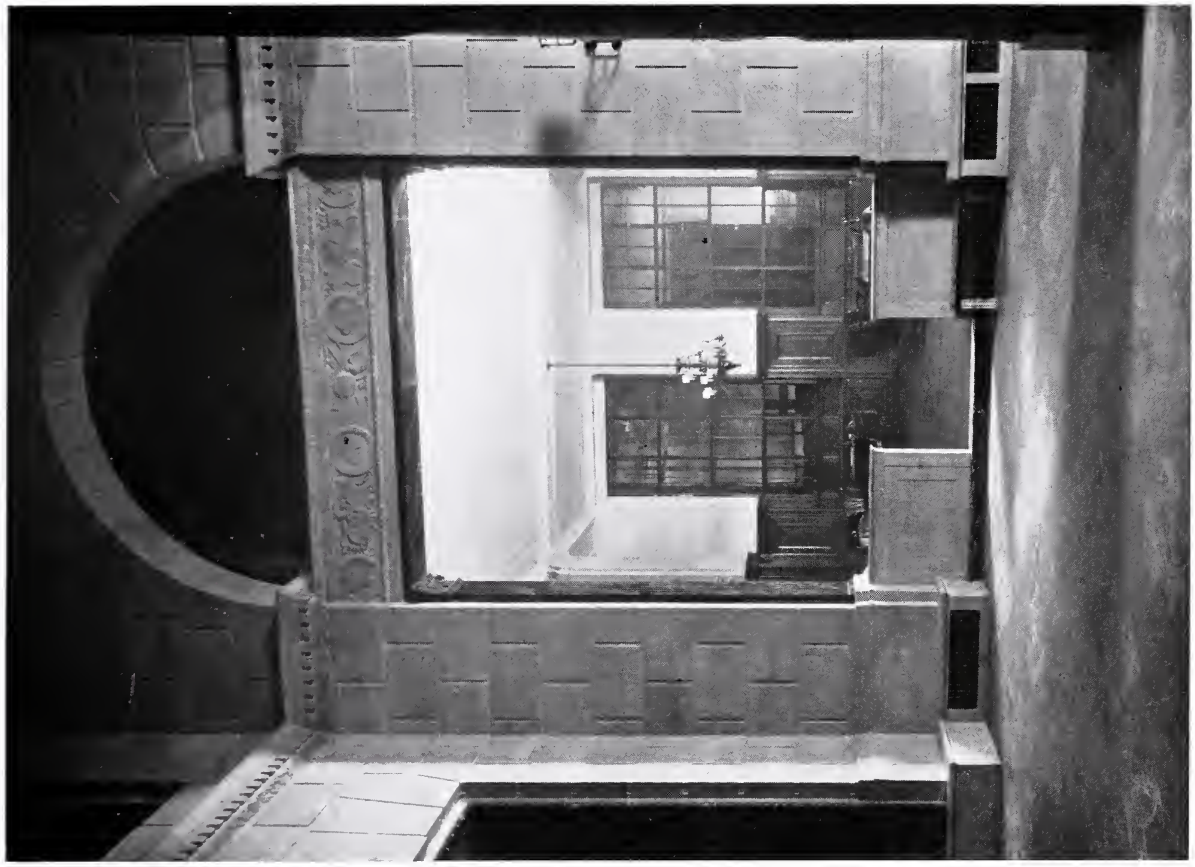
SECOND FLOOR PLAN



FIRST FLOOR PLAN

BANKING ROOM, NEW YORK TRUST COMPANY, NEW YORK

WALKER & GILLETTE, ARCHITECTS



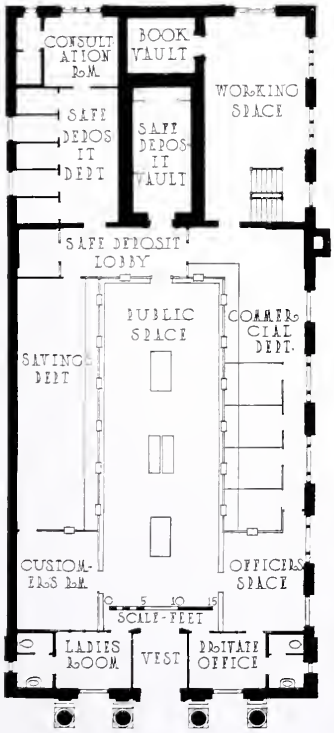
OFFICERS' SPACE

DETAIL OF LOBBY

BANKING ROOM, NEW YORK TRUST COMPANY, NEW YORK

WALKER & GILLETTE, ARCHITECTS

GENERAL EXTERIOR VIEW

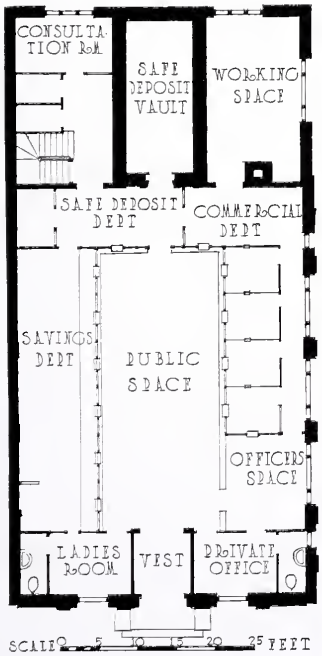


FIRST FLOOR PLAN AND INTERIOR VIEW

NATIONAL BANK OF COMMERCE BUILDING, NEW LONDON, CONN.

THOMAS M. JAMES, ARCHITECT

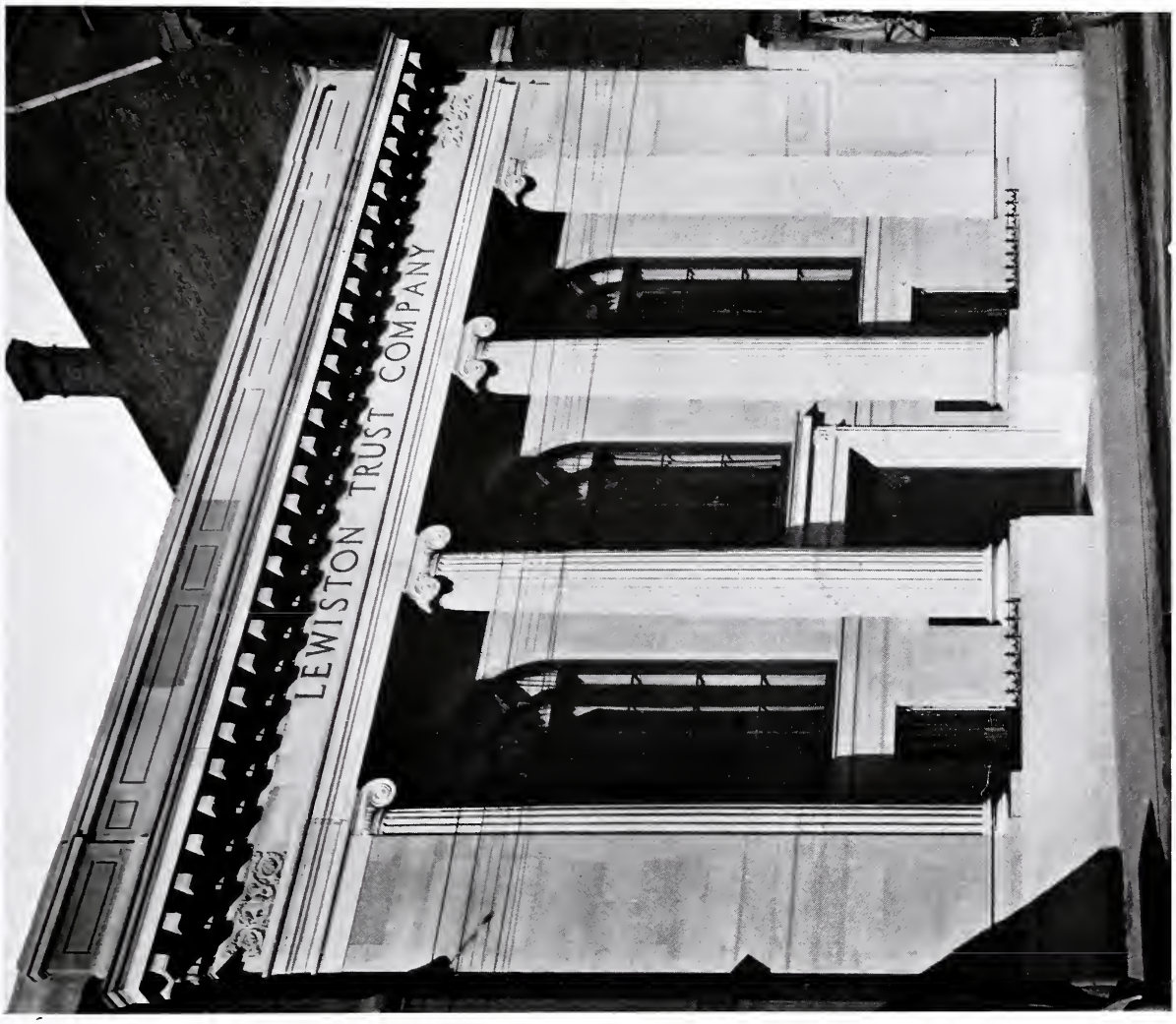
GENERAL EXTERIOR VIEW



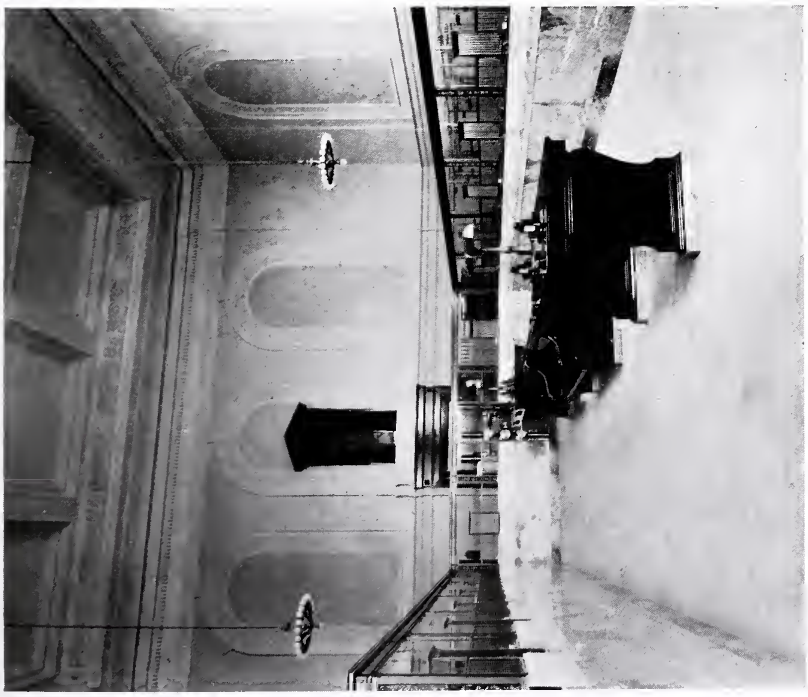
FIRST FLOOR PLAN AND INTERIOR VIEW

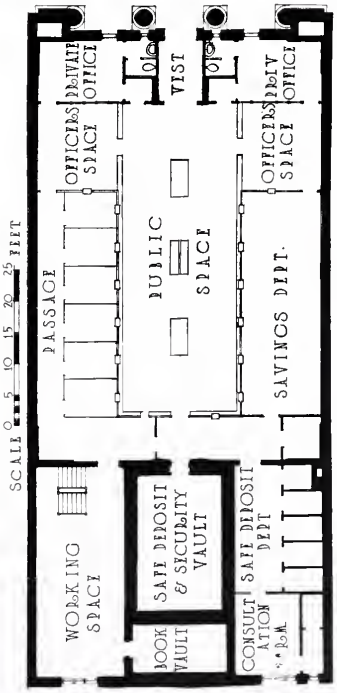
FIRST NATIONAL BANK BUILDING, BIDDEFORD, MAINE

THOMAS M. JAMES, ARCHITECT



GENERAL EXTERIOR VIEW



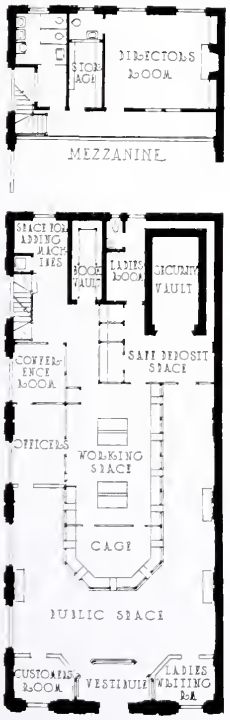


FLOOR PLAN AND INTERIOR VIEW

LEWISTON TRUST COMPANY BUILDING, LEWISTON, MAINE

THOMAS M. JAMES, ARCHITECT

GENERAL EXTERIOR VIEW



FLOOR PLANS AND INTERIOR VIEW

FIRST NATIONAL BANK BUILDING, SOUTH AMBOY, N. J.

HOLMES & WINSLOW, ARCHITECTS

ENGINEERING DEPARTMENT

Charles A. Whittemore, *Associate Editor*

Systems for Building Heating and Domestic Hot Water Supply

PART II

By JAMES A. McHOLLAN, *Vice-president, The R. P. Bolton Company, Consulting Engineers*

IN addition to the services of building heating and hot water supply, discussed in the December issue, steam may be required for restaurant, laundry or manufacturing purposes. In buildings equipped for the production of electric light and power, the steam required for these services is obtained direct from the main boilers. In buildings for which the electric light and power is purchased, and in which the heating boilers should operate at low pressure, new methods of providing steam for these services have been found economical, and information regarding them will be of interest to architects and engineers.

RESTAURANTS AND KITCHENS.—Cooking appliances may be gas- or steam-operated. Ranges are operated by gas, coal or electricity, but in these varieties of apparatus, found in almost every kitchen, either gas or steam must be used in operation:

Stock kettles	Vegetable steamers
Coffee urns	Clam, lobster or potato steamers
Steam tables	Egg boilers
Plate and cup warmers	

Gas is being successfully used under all these appliances and appears to be coming into more general use. If steam is to be supplied it is not necessary that the supply be at high pressure. If the piping system is made large enough, low pressure steam at a pressure not exceeding 10 lbs. per sq. in. will cook effectively and economically. Higher pressures used in existing installations, ranging from 30 to 80 lbs. per sq. in., are unnecessary, and they sometimes require the presence of a licensed engineer in attendance.

These figures deal with the quantities of steam consumed by kitchen devices and may be used in arriving at the sizes of steam boilers required:

Appliance	Steam-used boiler; horse power per hour
Stock kettles (per 10 gals.)	.5
Coffee urns, etc. (per gal.)	.1
Steam tables (per ft.)	.2
Plate and cup warmers (per 20 cu. ft.)	1.0
Vegetable steamers (per compartment)	1.0
Clam, lobster or potato steamers	1.0
3-compartment egg boilers	.5
Jets for sinks—½-in.	1.0
Bain Marie (per ft.)	.5
2-compartment tube type dish washers	2.0
Dish washers of the conveyor or roller type	2.0

This table shows the sizes of supply and return steam pipes to kitchen appliances to be operated with low pressure steam:

Appliance	Supply pipe (inches)	Return pipe (inches)
Stock kettles (40 gals.)	1¼	1
Coffee urns (6 gals.)	¾	¾
Bain Marie (36 ins. long)	1¼	1
Plate and cup warmers (20 cu. ft.)	1	¾
Vegetable steamers (per compartment)	1	
Clam, lobster or potato steamers	1	
Egg boilers (3-compartment)	¾	

In addition to these devices, a supply of steam should be provided at silver sinks and dish washing machines, unless a hot water supply at about 180° Fahr. is provided. If hot water of lower temperature is supplied, it is necessary to inject steam to raise the temperature so that silver and dish cleaning may be quickly and properly done.

These results of observations show the actual amounts of steam used in a large restaurant kitchen, in relation to the number of persons served. Steam was measured over a period of four days.

Time of kitchen operation	Hours per day	Average lbs. steam per hour	Lbs. steam per day	No. of persons served	Lbs. steam per person served
7 a.m.—1 a.m.	18	332	5976	1705	3.5
7 a.m.—1 a.m.	18	330	5940	1548	3.78
7 a.m.—1 a.m.	18	299	5382	596	9.04
7 a.m.—1 a.m.	18	319	5742	1114	5.16

Average steam used per hour of kitchen operation . . . . . 320 lbs.
Steam used per person served . . . . . 4.64 lbs.

These observations show a certain relation to the number of persons served, although as might be expected the usage per person is lower on busy days.

STEAM IN LAUNDRIES.—In a hotel, club or institutional building a laundry is usually provided and a supply of high pressure steam is required in the operation of mangles and pressing and ironing machines. The steam pressure required varies from 70 to 100 lbs. per sq. in. For drying rooms, drying tumblers, starch kettles and washing machine, it is only necessary to provide a low pressure steam supply.

Unless coal- or oil-fired high pressure boilers to provide steam to produce electric power are to be installed in a new building, in which case steam for

the mangles and ironers is obtained direct, the proper usage is to install an individual gas-fired boiler for the laundry service. Even with manufactured gas at prices over $1 per 1,000 cu. ft., these boilers have proved economical. Operation is automatic; city regulations do not require a licensed engineer in attendance, and the cost of operation is lower than might be expected as the boiler is in service only when the mangles or ironers are being used. Washing machines in laundries require very hot water. Some operators insist that the water should be practically at boiling point, yet in some laundries the washing is done with water at as low a temperature as 170°. A supply of low pressure steam to the washing machines can be used to raise the water temperature, although this is usually wasteful in operation.

Steam for Manufacturing.—In loft and manufacturing buildings, in which printing, chemical processes, hat making and other similar kinds of business are carried on, high pressure steam may be required. The use of the automatic gas-fired boiler in such cases cannot be too strongly advocated. The boilers can be installed after the building is erected, proportioned to the tenants' demands for steam, and placed under their control. The gas supply can be metered and each tenant charged in proportion to the amount used. In loft and manufacturing buildings, a main gas supply pipe of 4 ins. from the street mains should be arranged for. A main rising line 3 ins. in diameter should be erected with outlets at each floor. Thus equipped, the needs of future tenants for steam supply for industrial processes can be taken care of in the way most economical to the building owner.

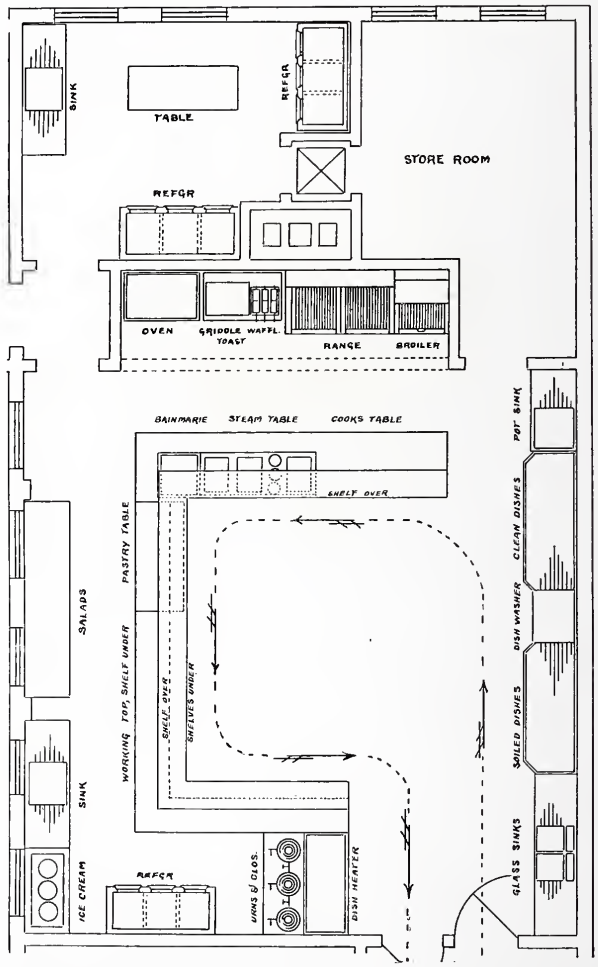
Data on Gas-fired Boilers.—This table gives data on maximum gas consumption and sizes of supply pipes for gas-fired boilers:

Size of boiler; horse power	Maximum hourly consumption cu. ft. gas	Size of service supply pipe; diameter in ins.
5	375	1½
10	750	2
15	1125	2
20	1500	2½
25	1875	2½
30	2250	3
35	2625	3
40	3000	3
45	3375	4
50	3750	4

A summary of the systems of steam supply in new buildings in which it is planned to purchase electric light and power may be of interest.

Building Heating.—Gas-fired, low pressure heating boilers in residences and small office buildings. Coal-fired, low pressure heating boilers in larger buildings. Vacuum or hot water heating systems should be adopted.

Hot Water Supply.—Gas-fired boilers for summer use. In winter, steam to be obtained from building heating boilers. Water temperature should be automatically controlled at heating tanks. Temperature of water leaving tank should be from 140° to 150° Fahr. Higher temperatures use more fuel and accelerate corrosion of piping. In kitchens and laundries, provide auxiliary heaters to raise temperature of hot water to about 190°, or arrange for supply of low pressure steam to individual appliances to mix with and raise temperature of water. Provide apparatus for de-activating water or other devices capable of arresting corrosion in hot water piping system.



All-gas Equipped Kitchen, Rogers Hall School, Lowell, Mass.
Kitchen proper 25 ft. x 25 ft. 6 ins. Accommodations for 250 people
Cram & Ferguson, Architects

Kitchen.—Either gas-operated appliances or low pressure steam for cooking. If steam is used, provide gas-fired steams boiler for summer use. In winter, steam for cooking is to be obtained from building heating boilers.

Laundry.—Gas-fired automatic boilers, operating at 100 lbs. pressure to operate mangles, ironing and pressing machines. These boilers also to provide steam to dryers, starch kettles and washers unless a supply of low pressure steam is available from the building heating boilers.

Manufacturing Processes.—Install gas-fired, high pressure boilers on the floors, besides the machines in which steam is to be used. Install proper sized gas piping to allow for installation of boilers when tenants' demands for steam are known or in event of changes in occupancy.

Electrical Wiring Layouts for Modern Buildings

PART I

By NELSON C. ROSS
Associate Member, A.I.E.E.

DURING the past year the writer has been asked by a number of architectural and engineering draftsmen where they could obtain a book, written in non-technical terms, that would give them a working knowledge of the electrical wiring layouts and equipment which are required in our modern buildings — something which would give them sufficient understanding of the subject to enable them to talk intelligently with electrical contractors doing work under the direction of their offices, to help them to become familiar with the different construction details of the work, and above all to be of assistance in the preparing of plans and specifications covering this type of equipment. While books covering all branches of electrical science are readily obtainable, to the best of the writer's knowledge, no work of the kind described exists, and it is the intention that these papers will, as far as is possible, furnish this information in the form required.

It is not the intention that these papers will be in any way technical, but rather descriptive of wiring layouts; each type of building is to be considered in turn, a typical layout described, and simple wiring diagrams furnished, so that anyone conversant with building plans may understand the details of the different layouts and the specifications covering the work. The layouts hereinafter described will, as far as is possible, be complete for each class of building, including circuit wiring and equipment. In the use of the schedules, tables and other information, however, judgment must be used, and this checked as far as possible by experience, as the buildings will require equipment and circuiting in proportion to the uses to which they are to be put.

Each building is a separate problem and must have separate treatment, as two buildings, particularly with reference to schools, even if built from the same plans, may require different wiring and equipment, depending upon whether the courses taught are industrial, commercial, academic or scientific, or whether any combination of these courses is taught in the same building. Again, the volume and control of the lighting will depend upon whether the building is to be used only for day work, or whether it is to be used also at night. In all cases, however, before any work on the plans is begun, it is advisable to get all possible information as to the use of the building and to proportion the wiring circuits and equipment accordingly.

Electrical Terms

Before taking up the discussion of the different wiring systems and equipment, however, it may be well to consider the meaning of the electrical terms in common use, as well as their application to the work. We are often told that the electrical service on a certain street, or in a certain town, is delivered at 110 volts or 220 volts, and in another town at 500 volts or 2300 volts, while power may be delivered over a three-phase alternating current circuit or a direct current circuit, until the terms become confused and are not well understood.

It may be said that on interior wiring layouts we are seldom required to consider high voltage, excepting possibly on the service wires, and this only when primary service is carried into the building and connected to a transformer bank. As a rule the voltage in the building will seldom be higher than 220 volts, and never higher than 550 volts. The latter voltage is used only on motor circuits.

The electrical terms with which we are chiefly concerned are the "voltage or pressure on the circuits," the "amperes or current flowing in the circuits," the "resistance of the wiring circuits and of the apparatus connected," the "wattage required for the lamps and equipment," and the "characteristics of the available electrical service for the building."

The "volt" is the unit of electrical pressure, just as the pound is the unit of steam pressure. On a steam plant or in a system of steam piping, the higher the steam pressure that is used in the system the greater becomes the strain on the boilers, equipment and piping, requiring heavier steam pipe and fittings, and greater care and skill in the installation of the work. Likewise on electrical wiring systems, the higher the voltage used the greater becomes the strain or stress on the wires and equipment, thus requiring a higher grade of insulation, greater spacings between exposed terminals, and greater care in the installation of the wires and equipment.

Broadly, the reason for the use of high pressures on either steam or electrical transmission lines is that, other things being equal, the higher the pressure used the greater becomes the over-all economy of operation. Again, as will be explained later, the greater the pressure used on the line the greater becomes the amount of power that can be delivered over a wire or through a steam pipe of a given size. And of course, with the use of smaller piping or smaller wire, the lower becomes the cost of installation. It is common engineering practice to operate cast iron heating boilers at from 5 lbs. to 15 lbs. pressure. Medium pressure boilers are operated at from 90 lbs. to 110 lbs. pressure, while certain types of marine boilers and large boilers in central power stations are often operated at pressures as high as 250 lbs. Likewise, on electrical wiring systems, low tension equipment, including bells, clocks, time recording systems, telephones, signaling devices, etc., is operated on pressures ranging from 5 volts to

30 volts, the service taken from primary battery, storage battery, or from motor-driven generating units. Incandescent lamps, flatirons, toasters, heating equipment and other electrical devices in domestic use are as a rule operated on a pressure of 110 volts, this pressure being standard on both direct and alternating current circuits.

Small motors are operated on both 110-volt and 220-volt circuits, on both alternating and direct current. 440 and 550 volts are standard pressures for alternating current motors. Very large alternating current motors of the synchronous type are operated direct from the transmission lines, without transformers, at pressures as high as 5,000 volts, while pressures used on certain transmission lines may be as high as 66,000 volts. Such pressures, however, are used only in connection with long distance power transmission.

The "ampere" is the electrical unit of current, and the ampere load may be considered as the volume of electrical energy flowing in the circuits. In water systems, when a large amount of water is required, a large pipe must be used to carry this water. Likewise, on electrical circuits, the greater the current required the larger must be the size of the wire to carry this current. The ampere load or current flowing in the circuits is of importance, as the volume of current determines the size of the wires in the feeder systems, and hence influences the cost of construction.

The "ohm" is the unit of electrical resistance, and may be regarded as the amount of resistance that will permit one ampere to flow in a circuit under a pressure of one volt. The equation $I = \frac{E}{R}$ is known as Ohm's law, and this equation shows the relation which the three electrical units bear to each other:

Where I = the current strength, or amperes,
E = the electromotive-force, or voltage,
R = resistance,

or $\frac{\text{voltage}}{\text{resistance}} = \text{amperes}$, $\frac{\text{voltage}}{\text{amperes}} = \text{resistance}$, and amperes $\times$ resistance = voltage.

The "watt" is the unit of electrical power and is the product of the current and pressure, or the amperes flowing in a circuit multiplied by the voltage of the circuit. Thus, in a circuit carrying 10 amperes under a pressure of 110 volts, the watts would be, 10 amperes x 110 volts = 1100 watts.

The "kilowatt" equals 1000 watts, and is the unit upon which all charge for electrical energy is now based.

The "electrical horsepower" equals 746 watts and is equivalent to the mechanical horsepower of 33,000 foot-pounds.

The "watt-hour" equals one watt maintained through the period of one hour.

If we were to purchase an electrical generator, capable of operating 100 lamps continuously, and each lamp consumed 100 watts, the capacity of the generator required must be 100 lamps times 100 watts, or 10,000 watts, or 10-kilowatt (k.w.) capacity. Again, if we were to operate 100 lamps on an electrical circuit for one hour, and each lamp consumed 100 watts per hour, the consumption of energy would be 100 lamps times 100 watts, times one hour, or 10,000 watt-hours, or 10 k.w. hours, and if we were paying 5 cents per k.w. hour for energy, the cost of operating these lamps for one hour would be 10 k.w. hours times 5 cents, or 50 cents. If operated for two hours the cost would be twice as much or $1, and if operated for one-half hour, the cost would be one-half as much, or 25 cents.

Service and Voltage

We are asked why one voltage is used on one plant and a different voltage used on another plant; also why a building in one district is served by alternating current, while a similar building in another district is served with a direct current. It may be said that all modern central station distributing circuits use alternating current where electrical energy is transmitted over distances exceeding 2,000 or 3,000 feet. The reason is that the characteristics of alternating current are such that the voltage or pressure can be raised or lowered by means of transformers, thus permitting the use of high transmission voltage, with consequent small wires, to carry the current from the generating station to the points where the energy is to be used, and at these points the pressure can be again lowered through step-down transformers to the voltage required.

Direct current voltage cannot be raised and lowered as just described without the aid of moving apparatus, and the characteristics of direct current are such that it is not advisable to generate at pressure higher than 550 volts. Direct current systems were in use, however, long before the alternating systems were developed, and direct current is still used on circuits operated by private generating plants where the distances over which the energy is to be transmitted are comparatively short. When direct current electric lighting service was first installed in the larger cities, the three-wire system of distribution, using pressures of 110–220 volts, was developed, and the current generated at this pressure. The generating stations were located in different sections of the city and an underground cable system installed, forming a network of mains, these mains being connected with the several generating stations.

The direct current systems as a rule cover but a certain area in the heart of the city. On all new installations to supply outlying districts, alternating current is used, and this accounts for the use of direct current in some sections of a city, and the use of alternating current in other sections. In the smaller cities and towns we do not, as a rule, find direct current used on central station circuits, as the use of central station current did not become common in these smaller towns and cities until after the development of alternating current.

The average pressure in use on alternating cur-

rent primary circuits does not exceed the standard pressure of 2,300 volts, and this is transformed at the points of service to 110, 220, 440 or 550 volts, depending upon the type of service that is required. Some of the older plants in the smaller towns, where little or no power service is supplied, are still using the single-phase current, and where motors are required, the single-phase motor is used. This is connected to operate from the lighting circuit, a separate meter being installed for this motor service and a special power rate made the consumer. Certain of the larger cities are still using the two-phase system for power service, with single-phase circuits for lighting service, the lighting service being taken from either phase of the two-phase system. The more modern plants, however, standardize on the three-phase system for power and the single-phase system for lighting, the lighting service being taken from either of the three phases of the system.

The two-phase system is seldom considered on new installations as the three-phase system is more economical and requires less copper in the transmission lines than the two-phase system. It may be said that alternating current motors are designed to operate on single-phase, two-phase or three-phase circuits, respectively, and at any standard voltage. The two-phase and three-phase motors will operate only on the two-phase and three-phase circuits, respectively. The single-phase motor will, however, operate on any one of the phases of the two- or three-phase circuit, provided it is designed for the voltage of the circuit to which it is connected. Direct current motors will not operate on alternating current circuits, nor will alternating current motors operate on direct current circuits. Lamps and heating devices, however, will operate equally well on either alternating or direct current circuits if of the proper voltage.

The Underwriters' Rules

All electrical wiring circuits using pressures greater than 10 volts must be installed in accordance with the rules and requirements of the National Board of Fire Underwriters, or the so-called "Underwriters' Rules," and in addition to the rules of the underwriters nearly all of the cities and towns have certain rules and ordinances regarding the installation of electrical wires and equipment which must be observed. Usually the city requirements are based on the rules of the underwriters, although many cities have more rigid requirements for certain fire districts than are required by the underwriters' rules.

Each city or town has an Inspector of Wires, who must keep in touch with all electrical work under his jurisdiction, and who must see that all rules and city ordinances are observed. When work is completed he must make a final inspection, and if the work is satisfactory, will give permission for the work to be connected to the service wires. In the design of any wiring layout it is advisable to get in touch with the Inspector of Wires in the town where the work is to be carried out, and also to confer with the representatives of the service company with reference to the location of the service and the meter requirements, as well as the type of the service to be supplied, in order that there may be no misunderstanding when the construction work is under way.

Electrical fittings, equipment, wires and other electrical materials pertaining to electrical wiring must have the approval of the underwriters' laboratories, and bear the underwriters' stamp of approval before they may be installed. The underwriters' rules cover the construction requirements on all types of electrical wiring circuits, both on low, medium and high voltage systems of distribution; they also include tables showing the current-carrying capacity of the different sizes of wire, fuses and switches, etc., and these rules must be strictly adhered to in the installation of the work. The rules are the results of the experience of years, and are intended to insure construction work that is safe both from the standpoint of danger to life as well as from fire hazard. The underwriters' rules, however, are not intended to cover the exact methods of installing the conduits, wires and other fittings, or the details of the work to be carried out at each outlet, as such details must be left to the skill and experience of those who are laying out the system and to the men who actually make the installation. The type of construction, however, as well as all wires and equipment that are installed, must conform to the requirements of the rules, in order to insure a satisfactory installation.

Early Methods of Construction

In the early development of interior electrical wiring systems, the matter of fire hazard was not well understood; high grade rubber insulation was unknown, switches, fuses and other current-carrying devices were of the crudest type, made up on wooden bases and with shells not always insulated from the current-carrying parts of sockets and fixtures. Fuses were of the open type and the wiring circuits were installed on the ceilings and walls, using weatherproof wire supported on wooden cleats. Where the circuits passed through walls and floors, they were protected only with a short piece of fiber or paper tubing, and no protection was given to the circuits from mechanical injury. As a result, many disastrous fires were caused by defective wiring and equipment, as well as from the lack of care and experience in the installation of the work.

As the appearance of exposed cleat construction on the ceilings and walls was unsightly, it was soon demanded that the circuits be concealed; this led to the development of wood mouldings in which the wires were carried, and also led to the concealing of the circuits, in buildings of frame construction. On new buildings of frame construction the wires were installed in the interior of the walls and floors, being supported on cleats or knobs, which in turn were secured to the floor timbers, etc., and where

passing through walls were protected by short pieces of vulcanized paper tubing. Later, porcelain knobs and tubes were substituted for wood, and the use of porcelain became universal for the bases of switches and other small electrical devices.

On buildings of masonry construction the wires were concealed in fiber conduits or brass-armored paper tubing; this tubing was also installed on exposed work, being stapled to the walls, etc., and the wires drawn in to the tubes. Where concealed wiring was first installed in existing frame buildings (old work), the wires were simply fished into the construction without protection other than the insulation, the floors being pocketed to permit this to be done; tap circuits were made in the concealed spaces and the taps run through the ceilings and connected to the fixtures. Later, this method proving unsatisfactory, flexible fiber tubes were used for protection, these being slipped over the wires before they were drawn into the building construction.

As the use of electrical power became more general and the wiring systems became larger, the danger of fire from these types of construction became apparent. Porcelain, slate, marble and other non-absorbent materials took the place of wood, on switches and other equipment; further, construction materials became standardized, and rules were established covering the methods of electrical construction, which, if followed, will insure an installation which will in no way become a fire hazard to the building.

On the early systems it was customary to carry the service wires from the nearest pole to the attic of the building; brackets and insulators were located on the outside of the structure, the service wires secured to these brackets and then passing through tubes in the building wall to the master switch, which was located in the attic. If a meter was considered for the measurement of the energy consumed, a meter loop was provided at a point near the master switch, while on the other hand the service might be sold at a certain rate per lamp-year.

Present Methods of Construction

Under present methods of construction (on large installations) it is customary to provide a service switchboard or panel at some point in the basement of the building, this panel containing the feeder switches, instruments and protective devices, as well as the recording watt-hour meters of the service company. At times the service switches and the watt-hour meters may be installed separately from the service switchboard, as these meters as a rule are the property of the service company. The service company brings the service wires to a point opposite the property of the consumer at its own expense. From the point of the property line the consumer assumes the expense of the service cables, and these may be installed from the pole to the building underground, or poles may be set on the consumer's property and the lines pass direct from the pole to the building. In the event of the overhead lines passing direct from the pole to the building, a cross arm or brackets are located on the outside wall, and a conduit of ample size to contain the service mains is run from the cross arm or brackets, down, on the outside of the building, to a point at the wall of the basement, thence through the basement wall and terminating at the service switches or switchboard.

As a rule the building is laid out in sections, and the location of lighting outlets, switches, lamps, motors and other equipment carefully considered before the plans are made; then the approximate load is computed, and centers of distribution established for the location of the panel boards. The location of the panel boards is not arbitrary, but these should, building conditions permitting, be located as near as is possible to the centers of distribution on each floor, so that the length of the branch circuits leading from the panels to the outlets may be as short as possible. The feeders, or sub-mains, are run from the service switchboard to the panels, these feeders being controlled from switches on the service switchboard. This method of construction tends to insure good voltage regulation as it equalizes the pressure on the lamps, due to ample feeder copper and comparatively short branch circuits. If the building is square or is built around a light well, there would as a rule be four panels located on each floor, each panel controlling one-fourth of the load, and the four feeders would run from the switchboard to the basement panel at each of the four locations, thence up, looping through the panels on the different floors.

Motor circuits would be grouped and carried back to one or more power panels, each fed from separate power feeders from the switchboard, excepting in the case of very large motors, which would be controlled on separate feeder circuits. Branch circuits would be run from each panel to the outlets and would pick up the different outlets of the lighting system, these outlets to be connected in groups. Each branch circuit is of No. 14 wire and there should be not more than 12 outlets connected to any one branch circuit. Where the wattage of the lamps is known, however, the number of outlets on a circuit should be controlled by this wattage. As a rule, a load of 660 watts is allowed on ordinary branch circuits, although where keyless sockets are used a greater wattage is permitted. If, however, it were determined to use 1,000-watt lamps, not more than one outlet should be connected to a circuit, while if 100-watt lamps were to be used not more than six outlets should be connected on any one circuit.

In the event of a private generating plant being installed in the building, or in an adjacent building, for the operation of the wiring system, the type of construction just described would still be considered, this regardless of whether the wires were installed in conduits, exposed, as on mill construction, finished work, or on knob and tube concealed work.

The National City Bank Building

MADISON AVENUE, 42D AND 43D STREETS, NEW YORK

McKIM, MEAD & WHITE, ARCHITECTS

THE old Manhattan Hotel, which stood for 20 years at the corner of Madison avenue and 42d street, has been converted into an office building, with the lower stories devoted to the uptown branch of the National City Bank and the National City Company.

The casual observer will not see any great change in the familiar exterior. He will note that the building has been sand-blasted, that the old main entrance with its portico and polished granite columns has completely disappeared and that in its stead the small corner entrance, which formerly led to the basement, has been expanded into a quite noble Roman portal, leading to the banking room on the first floor. Then he will observe that the old sidewalk subway entrance has been eliminated and combined with the new office entrance at the west side of the building on 42d street, and that this entrance leads into a corridor which passes between banks of elevators through to 43d street. Also it will appear that the many small windows which marked the hotel bathrooms on the old facades have given p'ace to large office windows Except for these changes, the judicious pruning away of a few

Smaller Public Space Opposite Entrance

Uptown Branch Bank Building, National City Bank, New York

McKim, Mead & White, Architects

outside balconies, and some modifications to the old mansard, the building from the outside looks substantially as before. This problem was clearly not one of the monumental type, but one of adaptation —an adaptation of a hotel, built in two parts, to the needs of a strictly modern bank and office building. We will not dwell upon the difficulties of such a problem nor on the compromises which, of necessity, were accepted, but proceed directly to the solution of what was a difficult problem.

The two courts, or shafts, which formerly gave light and ventilation to the hotel,were thrown into a large central court of about 30 x 90, giving light to the office floors, and by means of a skylight to the central portion of the banking room. This room occupies the entire first floor, with the exception of the elevator hall and entrance. This gives a great room about 100 x 200 in floor area. In order to obtain a large clear space on the Madison avenue side, it was necessary to remove several columns between the two old dining rooms, in the middle of the Madison avenue frontage. This required carrying their loads on a number of 72-inch girders on the second floor, these in turn requiring new columns extending to footings at bed rock.

This banking room is designed to accommodate the uptown branch of the National City Bank and the offices of the National City Company. There are entrances from the corner of 42d street and Madison avenue, from 43d street, and from the office building elevator hall to a generous public aisle. On the street sides of this public space, and separated from it by marble balustrades with bronze gates, are located the platforms for the officers of the bank and of the National City Company, the bond salesmen, and the trust department. The entire central portion of this floor, separated from the public space by a colonnade of 16 marble columns and a marble and bronze counter screen, is given over to the tellers' cages and the clerical working force. This space is splendidly lighted from the great central court above. In the northwest corner of the first floor there is a department for women, with special tellers' and retiring rooms.

Over the public space and the officers' platforms extends a coffered ceiling of ornamental plaster. The walls of the banking room above a Botticino marble base are of artificial stone. The floor of the public space is of Knoxville marble with Travertine borders and steps. The working spaces are floored with cork tile and the carpeted spaces on platforms have cement floors with Travertine borders. Door trim, balustrades, counters and columns are of Botticino marble.

Stairways and elevators at each end of the first floor give access to the quarters of the National City Safe Deposit Company in the basement. The area of the vault is 30 x 69, and it is divided into two stories. Access is by means of two 40-ton vault doors. The walls are of concrete, 18 inches in thickness, heavily reinforced in both directions by steel bars, lined inside with 3 inches of steel plates, and provided over the entire exterior with electric protection. The upper level is devoted to safe deposit boxes, 4,000 of these being provided in varying sizes. Coupon booths and committee rooms to the number of 40 are directly accessible on the basement floor. The lower level is devoted to safe deposit space for the bank's funds and papers, the remainder of the sub-basement being given up to the necessary machinery and other service spaces.

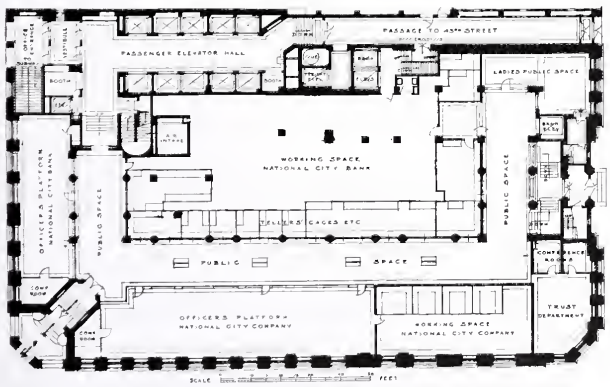
A complete system of mechanical ventilation has been installed for the basement and first floor. The Madison avenue side of the basement has been very simply treated to accommodate the special interest, payroll and foreign exchange departments of the bank, and has new public entrances at both the 42d and 43d street ends and from the subway platform.

As may be seen from the typical floor plan, the layout of the office building is simply of one row of outside offices and one of court offices, served by a dividing corridor of normal width, extending entirely around the floor and passing between the banks of elevators. This corridor in part remains from the old hotel plan. In certain cases, however, where tenants have rented all or a large part of a floor, this corridor is eliminated and the sub-divisions, largely of standard wood and glass office partitions, have been made to suit individual requirements. The entire 14th floor has been leased by the Uptown Club and designed to meet their requirements with extensive dining rooms, reception rooms and elaborately equipped kitchen service with necessary auxiliary rooms.

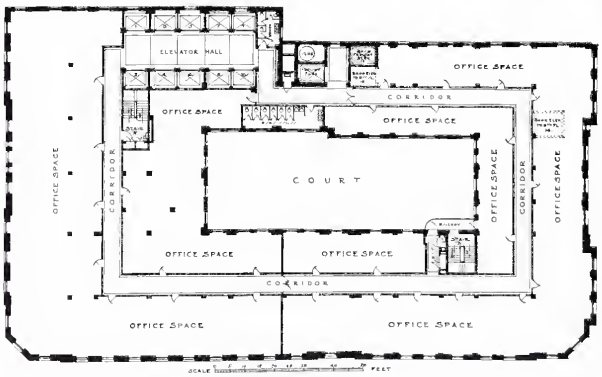
A few words about the material used may be interesting. As far as practicable in the office portion, old material was refinished and re-used. In general, however, all that remains of the old building is the outside shell, somewhat modified, together with most of the steel frame and floor arches, part of the interior court walls, the old bedroom doors in offices, and a small portion of the mechanical equipment. The new materials are principally standard and limited by cost; for offices, cement floors and cove bases throughout; office corridors, terrazzo floors with domestic marble bases; lining of elevator halls, Botticino marble, and skylights are of vault light construction.

On the first floor the change is quite complete. We find all the vestibules and halls lined with Botticino marble, Tennessee marble floors, Travertine steps and a barrel vault with ornamented plaster coffers in the elevator hall. Extensive use has been made of steel combination buck and frame for doors and windows, thus eliminating trim. The alterations have involved the transformation of a building planned for one definite, specific purpose into a structure equally well adapted to a purpose wholly different, and the building possesses that combination of solidity and architectural dignity which fittingly symbolizes that strength and power which belong to a great financial institution.

VIEW IN PUBLIC SPACE



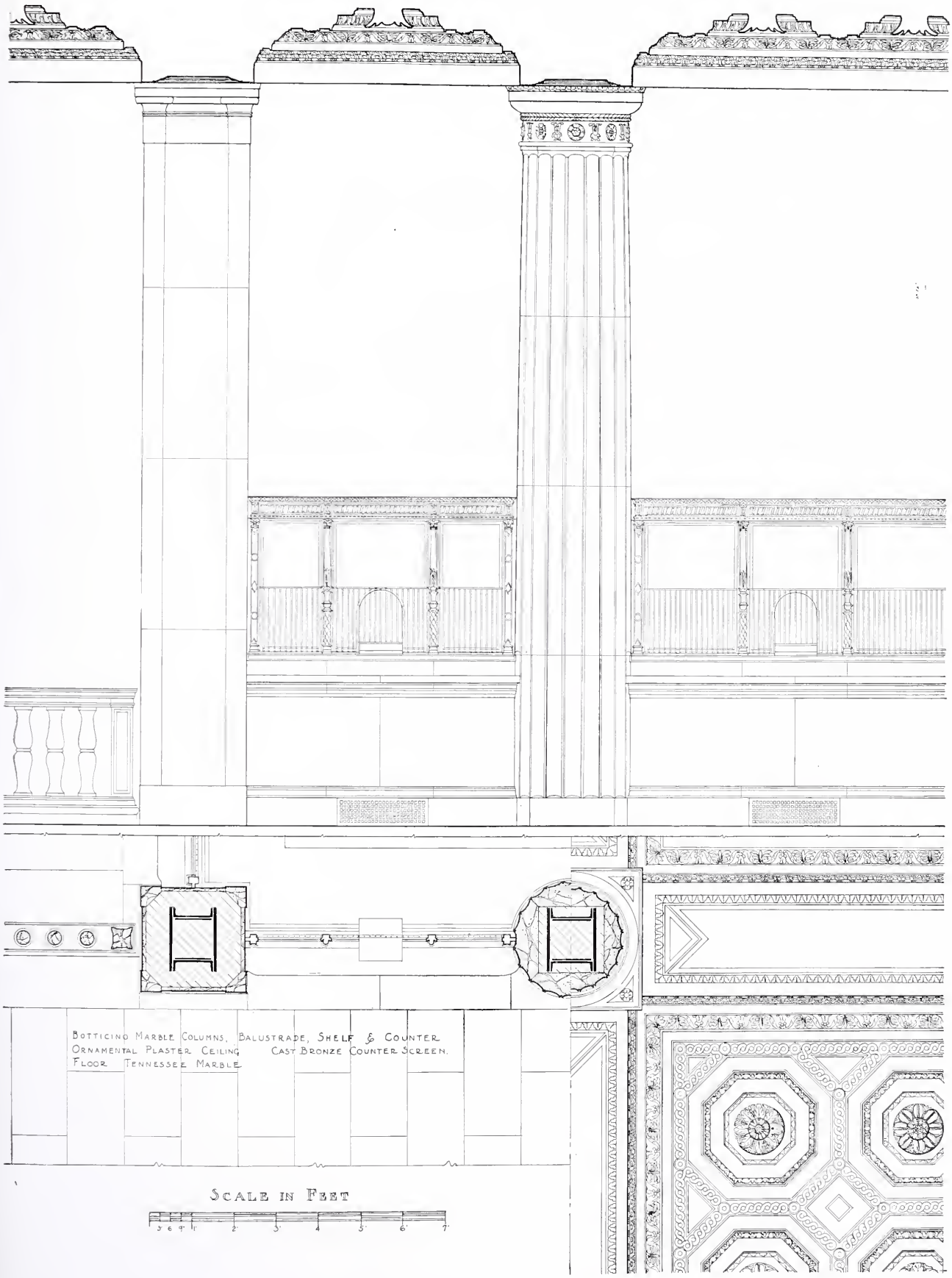
FIRST FLOOR PLAN



TYPICAL OFFICE FLOOR PLAN

UPTOWN BRANCH BUILDING, NATIONAL CITY BANK, NEW YORK

McKIM, MEAD & WHITE, ARCHITECTS



DETAILS OF COLONNADE AND BANKING SCREEN

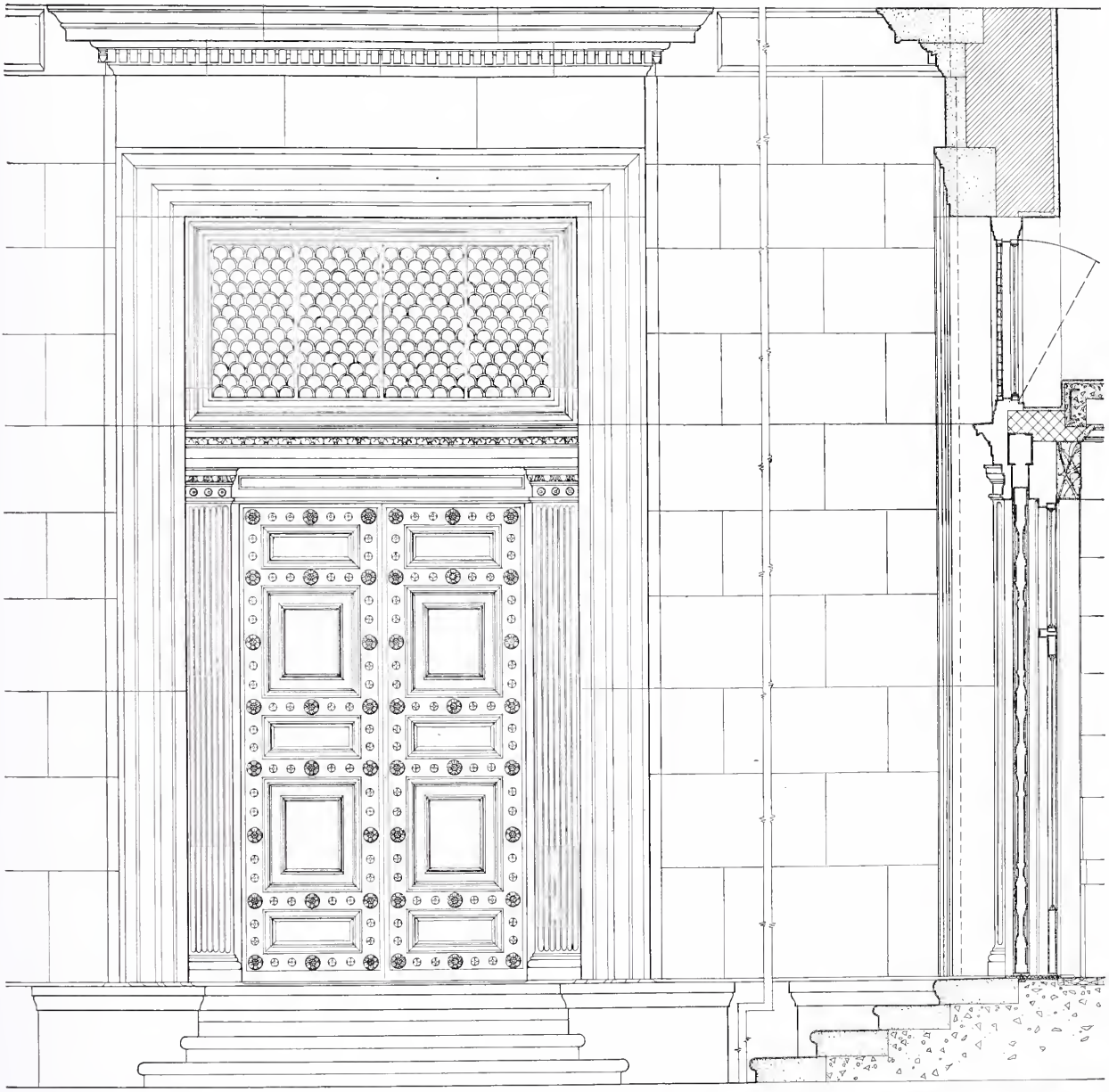
UPTOWN BRANCH BUILDING, NATIONAL CITY BANK, NEW YORK

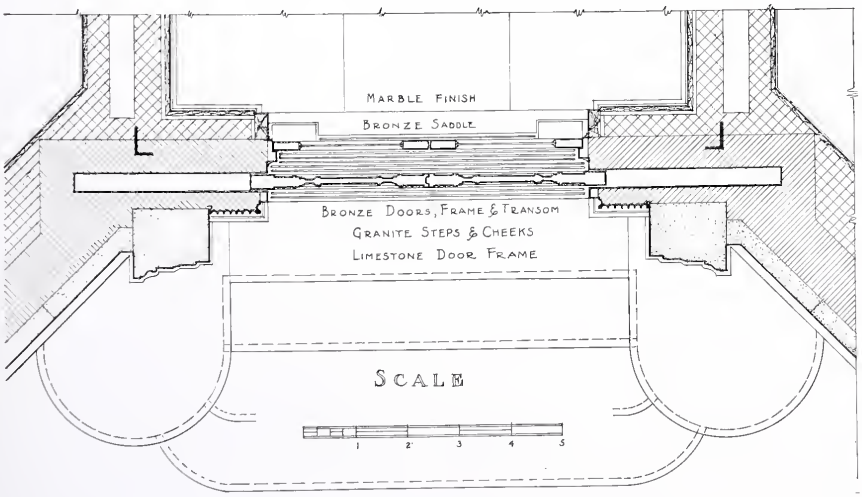
McKIM, MEAD & WHITE, ARCHITECTS

DETAIL OF OFFICERS' SPACE

UPTOWN BRANCH BUILDING, NATIONAL CITY BANK, NEW YORK

McKIM, MEAD & WHITE, ARCHITECTS

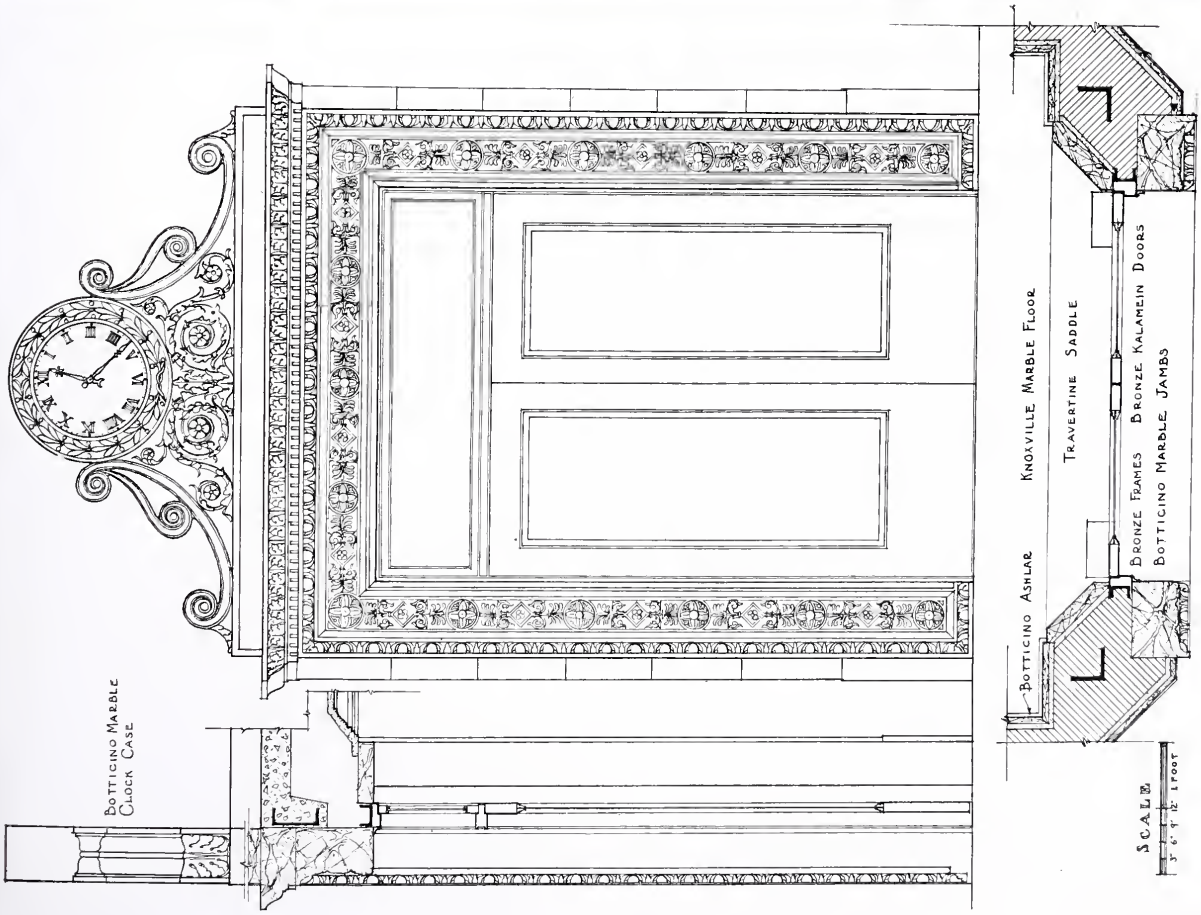




EXTERIOR DETAILS OF MAIN ENTRANCE

UPTOWN BRANCH BUILDING, NATIONAL CITY BANK, NEW YORK

McKIM, MEAD & WHITE, ARCHITECTS



INTERIOR DETAILS OF MAIN ENTRANCE

UPTOWN BRANCH BUILDING, NATIONAL CITY BANK, NEW YORK

McKIM, MEAD & WHITE, ARCHITECTS

Villas of the Veneto

V. THE VILLA VELLUTI, AT MIRA VECCHIA, CANALE DI BRENTA

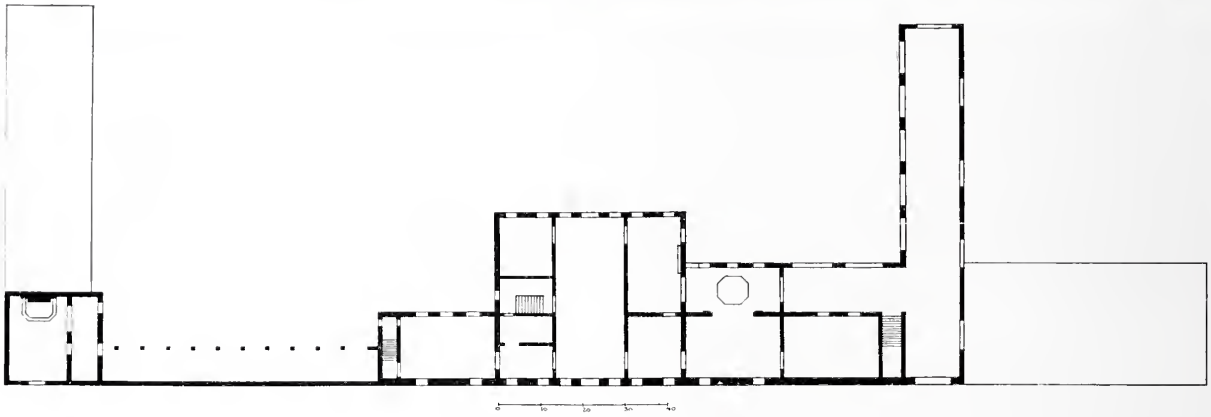
By HAROLD DONALDSON EBERLEIN *and* ROBERT B. C. M. CARRERE

THE Villa Velluti, at Mira Vecchia on the Canale di Brenta, is a typical example of the lesser villas so common all along that thoroughfare, especially between Malcontenta and Strà, and also in other parts of the adjacent region. It is of a later period than Palladio's time, and later than most of the great villas designed by his immediate successors or imitators. It dates from the eighteenth century or, perhaps, very late in the seventeenth. At one period of its history it was a shooting box belonging to the Bishops of Padua and occupied by them when they came down in the autumn with a numerous following of guests and retainers to shoot marsh fowl that abounded in the fens and on the canals. Witness, in one of the rooms, the great elevated octagonal hearth, surmounted by a funnel hood, upon which the sportsmen were wont to roast the results of their day's bag on spits over the glowing coals.

Who the architect was we do not know, nor do

Villa Velluti, Barns and House from the Garden

Elevation of Front toward Road



Floor Plan of Villa Velluti

we know many of the details of the villa's individual history which, for the most part, is unrecorded. But the house is significant as a local type and because it reflects so plainly the enduring prevalence of Palladian influences, albeit those influences appear in an unpretentious and greatly simplified or, indeed, modified form.

To understand the plan of this villa and its connection with a rather unusual environment—the same may be said of numerous other villas of which it is a representative type—one must form some mental picture of the Canale di Brenta and of the exceptional conditions that obtained along its course from the fore part of the sixteenth century, when the Venetians began to extend their zone of habitation to the mainland for a portion of the year. The Canale di Brenta is in many respects more like a street than a mere waterway. In the sixteenth century, and for hundreds of years after, the canal and the roads on each side of it formed the main artery of communication between Venice and Padua. The Venetians, with their natural predilection for water travel, found it convenient to come in their barges or gondolas to the very doors of the country houses they built along its banks. Many of these craft were exceedingly magnificent, with canopies of crimson and gold, curtains of rich silk or brocade, and the gondoliers or rowers in the gay liveries of their masters. In the seventeenth and eighteenth centuries each family had for this suburban journey a sort of light houseboat, called a *burchiello*, fitted with all possible comforts. The occupants dined or supped sumptuously on board and spent the time between whiles playing cards.

Some of the nobles would come in their barges as far as the mainland and there be met by their great coaches in which—or else upon horseback—they would complete the journey to their villas with all the splendid pomp and circumstance so dear to the Venetian temperament. This multicolored and picturesque life upon the canal and its flanking roadways, along with the flow of more prosaic traffic, reached the zenith of its activity in the eighteenth century and continued unabated until the fall of the republic.

Now all this is changed. A tramway, with becoming deliberation, transports the traveler from Fusina to Padua. The canal bears only freight boats on its surface. On the roads are no longer seen the stately equipages of the great, but in their stead a motley stream of motor cars, bicycles, two-wheeled and four-wheeled horse-, donkey- or ox-drawn vehicles of nondescript and antiquated patterns—especially on market days—and even wheelbarrows as means for the conveyance of humans, vegetables and poultry. Many of the villas have come upon evil days and are either falling to decay or are tenanted by the swarming families of *contadini*. Enough traces of the canal's former glory remain, nevertheless, to give one a fair idea of what it once was and to well repay the architect traveler.

When a bend of the canal, or some other chance occasion, deflects one or the other of the roads for a short space from the immediate banks of the stream, the villa grounds in that interval extend to the water's edge. The water steps and gates to such estates were sometimes the objects of very engaging architectural treatments and contributed an unusual element of interest to the general composition. The majority of the villas, however, like the Villa Velluti, lay directly on the road between which and the canal was an open stretch of green-

DETAIL OF FACADE TOWARD THE ROAD

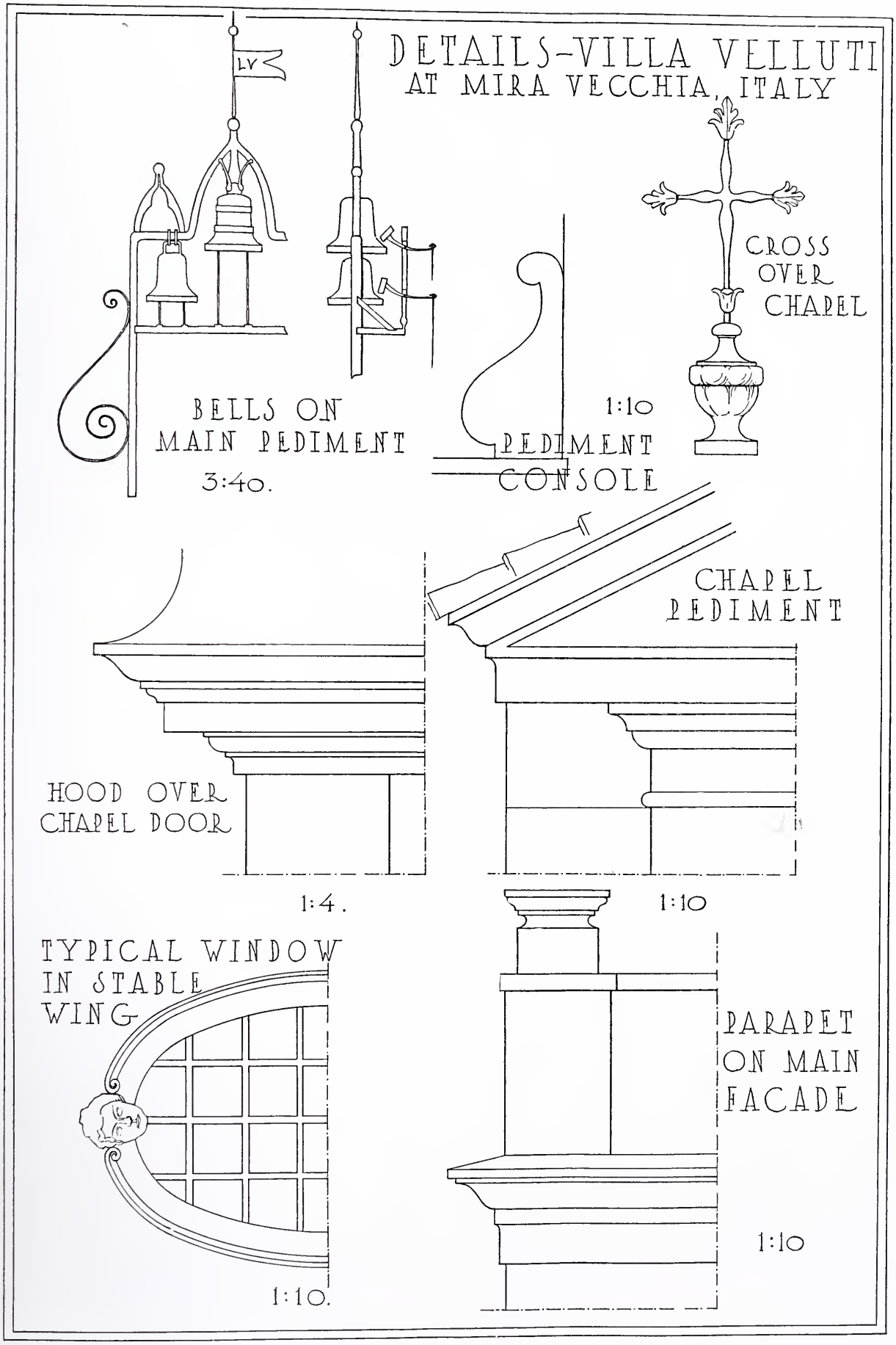
VILLA VELLUTI, MIRA VECCHIA, CANALE DI BRENTA, ITALY

Court at Junction of House and Stables

sward so that those arriving by gondola or barge crossed the grass and the road and presently entered the house without passing through courtyard or garden. As the villa habit increased among the Venetians, the land on both sides of the canal became more and more in demand for residence purposes so that eventually there were two continuous chains of country houses, facing each other from the opposite banks and separated by the width of the stream and its parallel highways.

The long established custom of placing the stables, *cantine*, granaries and other farm buildings in close proximity to the master's house, making one unbroken group of the whole assemblage, was too strongly entrenched in popular favor to be set aside merely by the advent of more and more neighbors desiring a water frontage. Besides, why should such a usage be modified or discarded? Its convenience and desirability had been approved by centuries of experience. It was an essential element in the amplitude of villa life as the Italian conceived it, and it was wholly in accord with a highly organized system of domestic economy—and had not the great Palladio sanctioned and glorified it by bestowing upon it a broader degree of "decorum" than it had pre-

Villa Velluti, Farmyard and Stables


DETAILS-VILLA VELLUTI
AT MIRA VECCHIA, ITALY
LV
CROSS OVER CHAPEL
BELLS ON MAIN PEDIMENT
3:40.
1:10
PEDIMENT CONSOLE
CHAPEL PEDIMENT
HOOD OVER CHAPEL DOOR
1:4.
1:10
TYPICAL WINDOW IN STABLE WING
PARAPET ON MAIN FACADE
1:10.
1:10

Entrance to Chapel and Part of Roadside Wall

viously possessed? Furthermore, it had the advantage of keeping the next neighbor on each side at a sufficient distance to insure one's own privacy. And so these villas displayed on the road front a length of wall calculated at a casual glance to magnify the impression of size, while in reality they were of but moderate extent. The gardens and farm lands stretched away to the rear. In one respect conditions along the canal made it generally expedient to modify one well defined scheme of Palladian layout by reversing it, and the Villa Velluti affords a good instance of such a reversal. Whereas one of Palladio's favorite types of country house plan prescribes a central block with wings returned *forward* towards the approach, here we see the central block with wings returned *backward* from the principal facade so that a straight run of wall may be exposed along the road front.

As the plans show, the actual dwelling part of the Villa Velluti is of modest proportions. To the west are the stables, granaries, *cantine* and other necessary accommodations for farming operations. To the east are the greenhouses, quarters for the farm people and, as a flanking feature and proper point of emphasis in the composition at the eastern end of the road front, the chapel, an essential adjunct invariably found either within the dwelling itself or in connection with every villa of any importance. Upon examining the plan of the master's dwelling it will be seen that the most conspicuous characteristic of the

Villa Velluti, Garden Front of Master's House

Carriage Entrance from Road

arrangement is the great central hall of the ground floor, which one enters directly from the outside. The same arrangement is repeated above stairs. The staircase is not an object of any architectural effort; it is shut off from both lower and upper halls by doors and its presence is virtually suppressed. The central hall plan, with rooms opening out from each side, prevailed both in the larger Venetian town houses and in Palladio's country houses, so it is easy to see how this manner of interior disposition became so general in the later villas. No matter how far the local architects in subsequent centuries may have departed from Palladian usage, there were two particulars in which they adhered to the practice emphasized in the Palladian age—the great central hall or *sala* as the pivotal feature of the plan, and symmetry of arrangement in exterior composition.

The garden to the south of the Villa Velluti (the side away from the road) was doubtless once laid out in formal manner according to the custom obtaining throughout the region, and some traces of this erstwhile formality still remain. From the far entrance to the grounds, on the south side, with its decorous urn-topped piers and wrought iron gates, on axis with the central hall of the house, can yet be discerned something of the old garden plan. But the passion for the *giardino Inglese*, which at one time swept Italy like a pestilence, destroying much that was valuable and leaving in its stead only a small measure of what was good, conquered the masters of the Villa Velluti too. As a result there is a *boscheria* with a little brook, an obviously artificial island, wooded mounds the contrivance of which proclaims equally obvious artificiality, rustic bridges, and all the other petty deceptions in which the Italian "Capability Browns" of that age reveled.

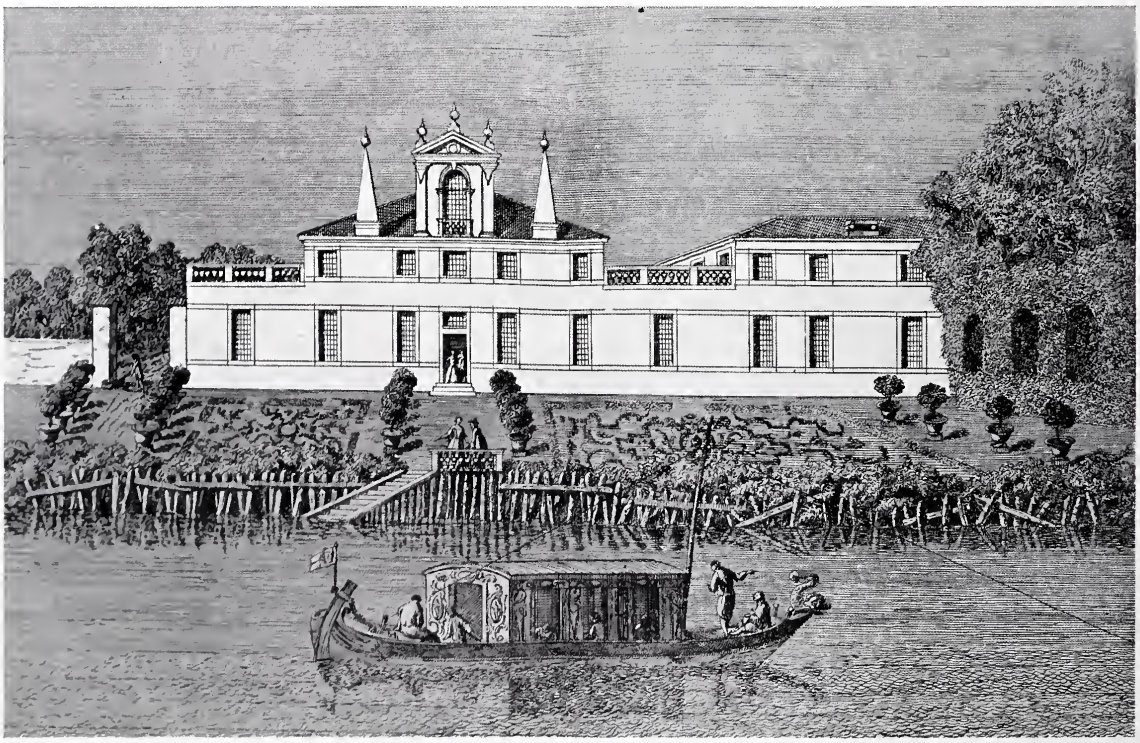
As one would expect, the house is built of brick and covered with stucco. This sounds prosaic enough until we remember what diversities of color the Italians impart to stucco surfaces, and likewise call to mind the gradations of hue to be found in the tile roofs—brown, red, yellow, orange, and the deep greens of mosses and lichens. In this case the stucco is a distinctly pinkish gray, the sills are of white stone, and the shutters, cornices and figures are white.

Villa Velluti, the Stable Arcade

On its road front the Villa Velluti displays extremely little ornamental detail and what there is on the facade of the dwelling itself is of the simplest sort—a modest cornice, a fillet and fascia carried as a belt course across the face of the gable to form pediment-wise what Palladio would have called a "frontispiece," the small inverted supporting scrolls, the wrought iron belfry on the gable peak, the clock face, and the stone figures on the gable and (originally) at the corners of the parapets. A long, unbroken stretch of intervening wall to the east serves as a foil for the modest decoration of the chapel facade. To the west, the expanse of walling is more varied by the arched carriage entrance and the succession of oval windows enclosed by mouldings with *mascarons* at each side. The garden front is even more severely plain. Here, however, the eye is arrested and interested rather by the arcaded ell of the stable and barn, with the oval, cross-barred openings in the upper story. The stucco of the barn ell is the same pinkish gray as the house, while the cornice and the mouldings about the windows are white.

The Villa Velluti, more than many of the villas of the Palladian following which fill the Veneto, possesses certain qualities which should be of value to the designer today. Without possessing strict and literal symmetry the villa exhibits a well balanced appearance such as is often striven for in designing American country houses. The placing of the chapel, as shown upon the plan, at some distance from the villa proper and the screening of the connecting arcade by a brick and stuccoed wall, increase the breadth of the group of buildings and balance the long wing upon the opposite side which contains the stable and other domestic offices, a string course of brick between the windows of the upper and lower floors continuing the line established in the wing to the left by the cornice and tiled roof of the arcade between the villa and the chapel.

That the Villa Velluti possesses distinct charm one feels sure at first sight. To determine exactly wherein lies the essence of the charm, however, is a more elusive process. The ensemble of the whole group of buildings is doubtless an important contributory element; the color and sundry other items, such as that truly Palladian touch, the clerestory gables at the sides with semi-circular Roman windows, have likewise their several values to contribute; but what is, perhaps, most significant of all in any thorough analysis is the symmetrical and straightforward composition of the principal mass with its agreeable disposition of voids and solids. The dominating symmetry of the master's dwelling is quite sufficient in formal accent to invite the play of moderate dissimilarity between the two flanking members and yet maintain the measured orderliness of the entire group. Altogether, there is a felicitous union of simplicity and elegance that cannot fail to invest the Villa Velluti with a very substantial quality which merits our interest in it today.



Courtesy of Bibliotica Marciana, Venic

An Early 18th Century Print of a Villa and Garden on the Canale di Brenta, Italy, Showing a Barge Characteristic of the Period

Concrete in the Field

By WALTER W. CLIFFORD
of Clifford & Roeblad, Engineers, Boston

WHEN a muddy appearing, gray substance is being spread over some steel rods on a wood floor form, it requires considerable faith on the part of the layman to believe that this is to become a strong, rigid floor. Even the architect or engineer with limited field experience, who knows that the mud will change to rock, finds it easier to visualize this change in the office than in the field. The architect who is supervising by occasional visits to the site has a difficult task on concrete work, because finished appearance is a poor criterion for internal strength. The best he can do is to avoid too great regularity in his visits, and assume that what he sees in process is typical. The clerk of the works or resident inspector has an advantage, being constantly on the ground, but he has plenty to do.

The forms should first be considered in concrete construction. In a way, they are merely a contractor's problem as he is responsible for the results obtained by their use. In practice, however, it is most satisfactory to have things right from the beginning; therefore, the field inspector ought to make sure that the forms are correctly constructed. The first requirement of forms is that they be accurately built to plan dimensions. A corollary to this is that they be rigidly braced so that they will retain their sizes and shapes under the loads of wet concrete. Metal interior column forms, in particular, need careful attention to insure plumb columns. The inspector will not have time to check the strength of forms, but while pouring is in progress the forms should be watched and any evidence of serious buckling should be the signal to stop work until the form is properly braced. A frequent cause for form failure is settlement of shores under first floor forms, when they rest on fill and do not have sufficiently large sills to spread concentrated loads. This point should always be carefully checked.

Cleaning forms just before pouring is a difficult point for the inspector. He should be forehanded enough to have clean-out holes at the bases of all columns and walls. Without them it is often impossible even to see conditions at the bottom, much less to clean out the sawdust and mortar chips which are sure to accumulate in such places. Clean-out holes should be so placed that it is possible to reach in and pick up chips anywhere along the construction joint. If a compressed air or steam hose is available, clean-out holes may be 10 to 20 feet apart and the nozzle attached to a pole used to blow all rubbish to the nearest hole. Clean-out holes are not ordinarily provided in round steel column forms as used for flat slab construction. Such forms can be placed after the forms above and the joints below are cleaned out, but even then watchfulness is needed to be sure no more dirt gets in. The construction joint at the base of the column cap in this type of construction is difficult to clean without compressed air. Great care should be taken to keep this joint clean. If this is not successful, or if laitance is allowed to form, dirt and chips must be gotten out through the vertical steel and spirals by hand.

Reinforcement looks more simple on the floor than it does on drawings. Well placed reinforcing is so regular in appearance that the omission of rods is quickly noticed. The number, size and general location of rods are easily checked. The condition of the rods often needs attention. A slight film of rust is not objectionable, but any loose, scaly rust should be removed with a wire brush. It sometimes happens that rods in storage or in places near where there has been previous pouring are spattered with mortar; where this is so, they should be brushed clean, as such mortar adheres only loosely to the rods.

It is important to have the rods properly located with respect to the form surface. Metal chairs, of which there are several good types on the market, should be used. Where these cannot be afforded, small concrete blocks of the required thickness may be substituted. Under no condition should the rods be laid directly on the form and pried up to

Typical Forms for Beam and Slab Construction
Clean-out hole may be seen on right side of column base

allow a film of mortar to flow under. When this is done the location of the steel is uncertain, fireproofing may be damaged and the slab may easily be greatly weakened.

Conduits for wires and occasional short lengths of service piping wander around rather promiscuously in the concrete of a modern building and often cause trouble to the inspector. Conduits, however, as ordinarily used, need cause no difficulty. The plane of conduits should be just above the main reinforcing in slabs. This necessitates the use of outlet boxes of suitable depths, or offsetting of the conduits at the box. Shallow outlet boxes are a frequent cause of interference between conduits and steel.

Iron conduits, parallel to reinforcing, are not harmful if they are satisfactorily spaced. The ordinary small conduit encased in concrete will safely take as much compressive stress as the concrete it replaces. In tension — longitudinally — it will aid the reinforcement. In the matter of spacing, conduits parallel to the main reinforcing may be considered as additional rods. Two adjacent rods should be spaced at least twice the maximum size of the aggregate apart in the clear. Conduit paralleling reinforcing rods should be placed between them rather than directly over a rod, for in the latter case the conduit is likely to destroy the bond over half the circumference of the rod.

Conduits 1¼ inches or less, crossing the main reinforcement, have sufficient strength as supported by the concrete to transmit stress. Larger conduits should be of heavy pipe if they must be located at points of high compressive stress. Conduits crossing the main reinforcement should be at least 4 inches apart in the clear, under ordinary conditions, to insure the concrete's flowing around the crossing point and bonding with the reinforcement between conduits. Outlet or panel boxes are often placed in columns. In such cases care must be taken to see that the conduits as they turn horizontally into the box are so spaced that they do not sift out coarse aggregate, causing a pocket underneath. Where conduits are running in several directions in a panel and crossing each other it will be best to have the lower layer under the reinforcing. These conduits will come very close to the surface and it is a good idea to wind them with fine wire to prevent spalling of the mortar film from the smooth surface of the conduit.

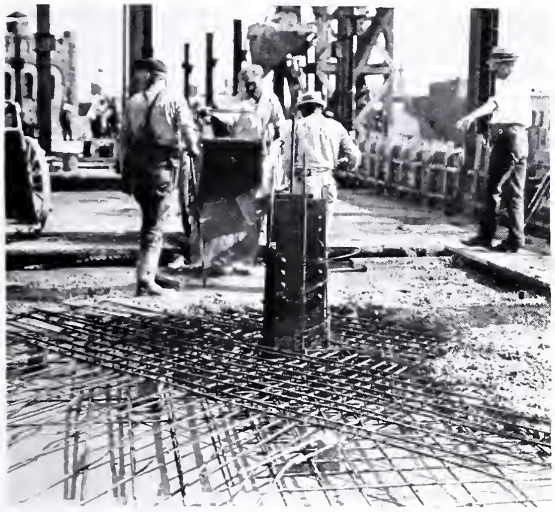
For the inspector the critical details on inserts are to see that all necessary inserts are placed, and that they are secured to the forms in a manner which will insure their remaining in place during the spading of the concrete. Some contractors prefer not to place inserts in the forms as they find it difficult to get them in the right positions and claim that it is cheaper to drill holes in the concrete afterwards and use inserts of the expansion bolt type. This is satisfactory if the loads to be supported are light and do not vibrate.

The approval of aggregates is an important duty which falls to the inspector and which requires the exercise of good, quick judgment. Specifications are sometimes indefinite on the subject, and often conditions at the work arise which could not be foreseen when the specifications were written. The maximum size of coarse aggregate is usually specified. In slabs or any other place where reinforcing bars are closely spaced, this should be rigidly adhered to, observing the relation that the maximum size of aggregate should be not greater than one-half of the clear spacing of the rods. On the other hand, in plain mass footings or walls there is almost no limit to the size of aggregate so long as the proportion of the whole mass is such that all pieces of coarse aggregate are firmly imbedded in mortar.

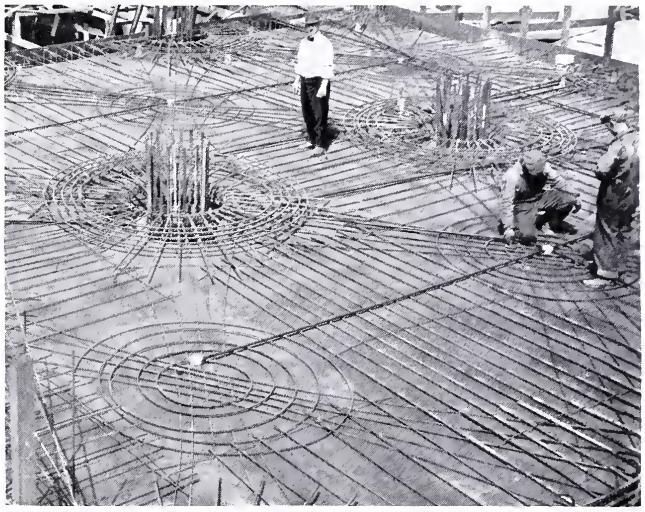
Hardness and soundness of the rock used as coarse aggregate is more important than whether it is gravel or crushed stone. Flat or finger-shaped pieces to an amount greater than 5 per cent should be excluded. Clean aggregates are essential. A film of dust, particularly on gravel, is detrimental to good concrete. Sand was for many years specified as "clean and sharp." Its cleanness is of paramount importance, but sharpness is now an obsolete requirement. Cleanness, as required for sand, is not easy to judge by inspection. 3 per cent of clay is not objectionable, but the same amount of organic matter would mean digging out the concrete and replacing it. There are various field tests given in standard text books which can be resorted to. A simple field test is to mix a small amount of 1: 2 mortar and see if it sets up hard within the proper time. On important work it is just as necessary to get laboratory tests on the sand as on the cement. Sand should be well graded, that is it should have coarse (¼-inch), medium (⅛-inch), and the fine grains (1/16-inch or less) in approximately equal proportions. A sand of which all particles will pass a No. 8 or 10 sieve, such as is used for plastering, is not good concrete sand.

Cement is measured by the bag, assuming that a bag is equivalent to 1 cubic foot. Sand and stone for hand mixing are usually measured in a bottomless box built of a size to give the required quantities for one batch. For machine mixing, aggregates are usually measured in wheel barrows or hoppers. For calibrating, a box of known content, conveniently 1 cubic foot, should be provided. With this as a measure all barrows or hoppers should be filled with the proper amount of material and paint or crayon marks made on the sides to show the proper filling depth. This process of measuring should be repeated from time to time as the markings become faint.

Barrows for measuring should not be of the flat pan type since a small difference in depth of filling, hardly noticeable, means a large error in measurement. There are various deep-bodied barrows and carts obtainable with vertical sides. All measuring barrows should be of the same type and size to avoid confusion. Two or more different mixtures are often used alternately. In varying the



Pouring Concrete from Carts



Good Example of Reinforcing Showing Conduit

Chairs show in foreground of illustration at left while in that on the right they are not yet installed

amount of aggregate, the measuring barrows should be so calibrated that one or more barrows can be omitted from the richer mix. This is more accurate and less likely to cause error than to change the filling line of the barrows.

Mixers are of many kinds. The batch or intermittent mixers are most satisfactory, owing to the difficulty of charging continuous mixers uniformly. Charging hoppers should be used on batch mixers as far as possible. They may save 80 per cent of the charging time of the mixer and reduce the temptation to skimp the time of mixing. For all reinforced work or water-tight work there should be at least one full minute of mixing from the time that the last of the materials is in the mixer until the first of the batch is dumped. It is not possible to tell from appearance whether concrete has been mixed a sufficient time or not. It will be found, however, that concrete mixed a full minute will require less water for the same consistency than concrete mixed half as long.

The consistency of concrete is most important. It is regulated by the amount of water used and the time of mixing. The desired consistency is that of a heavy paste which will of itself flow very sluggishly around the reinforcement. A batch of the proper consistency, when dumped from a barrow, will neither break nor flow readily over the edge. On the floor form, it will settle slowly but retain the shape of a mound and no water will run out. In the future, standard slump tests * for consistency will be more and more required. Having determined by trial the proper quantity of water at the beginning of a mixer run, this same amount can and should be controlled by some water-measuring device and used until conditions change. Alternate dry and wet batches made at the whim of some laborer are unsatisfactory. The first or trial batches should be put where they can be taken care of even if of poor consistency—not in a column or deep girder. One gallon of water for each cubic foot of stone is a good quantity for the trial batches.

From the mixer, concrete is dumped into a bucket and hoisted up in a tower to a hopper from which distribution is by chutes or by barrows and carts. With chute distribution of concrete the temptation to make the concrete too wet is great. Slopes varying from 1 in 6 for distances up to 50 feet to 1 in 3 for a 300-foot distribution should be the minimum slopes. Open metal troughs, about 10 inches wide, are most used and are suitable for slopes ranging from the minimum, as just given, to about a 1 in 2 slope. Open troughs should have a uniform grade or increase slightly in pitch as they get farther away from the tower; there should be no reversals in grade. Where slope greater than 1 in 2 is used, the trough should be replaced by a 5- or 6-inch sheet metal pipe. Barrows or two-wheeled carts are also commonly used to distribute concrete. They are economical on ordinary sized work and have the great advantage that a mixture of better consistency can be used with them.

Thorough cleaning of every piece of equipment used for mixing, placing or transporting concrete is essential. Mixers, chutes, barrows, hoppers and tools should always be thoroughly washed down before and after using. Caked concrete in the mixer reduces its efficiency greatly and in chutes or barrows it will clog the flow of fresh concrete and as it breaks will introduce spongy, worthless material.

The placing and spading of concrete require both skill and strength. The laborers wheeling concrete or handling the chute must be efficiently directed, and in addition some shoveling as well as spading must be done to get all the concrete in place. Footings and walls are placed in layers 6 to 12 inches deep. The sections should be small enough so that not more than half an hour will elapse between the placing of separate layers at any point. Columns should be poured their full height at one time and are usually allowed to get their shrinkage (half an hour is sufficient in summer weather) before

* See "Tentative Specification for Workability of Concrete for Concrete Pavements," Am. Soc. Test. Mat., D62—20T.

the floor is poured. Slabs are poured their full thickness progressively along the floor, filling the beam forms at the same time. Temporary screeds are set to give grade and the surface is struck off to grade as it is poured. Without special attention the slabs near upstanding spandrels will come up from the weight of concrete in the beam. This necessitates expensive picking to get it down to grade for finish. Rough slabs which are to have granolithic finish can be roughened up most economically with a short-tooth garden rake as soon as the concrete has had its initial set.

Spading along the face of the form used to be considered necessary, but it has been found that spading in the middle of the beams will give just as good a surface. A sufficient amount of any spading, rodding or joggling will answer all necessary purposes. The main reason for spading is to liberate entrained air and prevent pockets by joggling the mass so that the cement and sand will have a chance to flow around all coarse aggregate and all reinforcing. A secondary function, important in many cases, is that of insuring a film of cement between the form and any aggregate so that the surface will present an even texture without voids or honeycomb when the forms are removed. From three to five men are needed to place and spade the output of a ¾-yard mixer.

Location of construction joints is left to the inspector's judgment. Beams and slabs are stopped against vertical bulkheads in the middle of simple spans. These bulkheads usually have to be notched over the reinforcement. Girders with a single beam framing in the center should be stopped at about the third point. Beams and slabs should always have vertical joints, never allowing the material to stop at its angle of repose. Horizontal joints should be so located that they can be cleaned before the pouring is resumed. Where this is not possible, as in the joint in a flat slab column at the base of the capital, all laitance should be chipped off down to clean aggregate before pouring again.

For laitance—the greasy scum which accumulates on over-wet concrete to the depth of an inch in bad cases—contains much valuable cement but has no load-carrying capacity. Horizontal construction joints should be indented with pieces of 2 x 3 or 2 x 4 wood, placed in the fresh concrete to form a key.

The time of form removal may well be left to the contractor, if he be a man of known skill. The time varies greatly according to weather conditions, from 24 hours for walls in good summer weather to several weeks for beams and slabs in cold weather.

Floor forms should not, of course, be stripped until the floors above are poured and preferably not until the second floor above is poured, to avoid the possibility of a fire in the upper forms dumping concrete on a young slab.

Frozen concrete is the usual excuse for premature form removal. Frozen concrete will ring from a hammer blow like well set concrete, but a little boiling water will quickly show the difference. Forms for mouldings or other ornamental work should be left as long as possible. The harder the concrete the less likely are the corners to chip.

Voids or stone pockets, which show upon removal of the forms, should be patched as soon as possible after examination has shown that the fault is not dangerous. When all precautions are taken, however, a little patching is usually necessary on the best of jobs—it is not necessary, however, to admit this to the contractor.

But all this knowledge without common sense is nothing worth. Good common sense and practical experience are necessary in order to make intelligently the exceptions to which every rule is subject. And, after all, satisfactory concrete work can only be obtained by selecting a capable contractor and adopting co-operation in dealing with him.

Pouring Concrete Footings by Towers and Chutes

BUSINESS & FINANCE

C. Stanley Taylor, *Associate Editor*

Straight Talks to Architects

V. WHAT IS YOUR METHOD OF CHARGING FOR PROFESSIONAL SERVICES?

IF there is any question calling for frank, open discussion by the architectural profession today it is that of methods of charging for professional services. It would seem that there are very few architects entirely satisfied with the fees received for their work and the methods by which they are paid. There are times when injustice is done to the client, but in most instances it is the architect who suffers.

The sale of direct valuable professional service constitutes a sound business proposition. Methods of charging for such service should, therefore, meet the requirements of sound business judgment. During the past few months we have had an opportunity of discussing this subject with a number of architects in various sections of the country. Naturally, wide divergence of opinion and practice has been found, but all methods tend toward similar objectives. It will, therefore, simplify this discussion to outline some of these objectives and to develop different methods which are employed toward their attainment.

Any method of charging for professional service is unsuccessful if it does not insure these results:

1. Payment for service which represents a fair profit to the architect, in accordance with the value of his services.
2. That this payment shall represent to the owner a charge against the cost of his building which is offset by the increase of intrinsic value directly resulting from services rendered by the architect.
3. That the architect shall be regularly reimbursed for the expenditures which he makes during the course of work done for a client, and that he shall regularly receive a fair proportion of his profit.
4. That the profit which the architect receives shall be commensurate with his skill.
5. That no project in the architect's office shall be the result of unfair and unethical competition with another architect on a basis of professional charges.
6. That the architect shall do no work without payment or make any expenditure on a client's project for which he is not reimbursed, unless he deliberately chooses to speculate on future possibilities of bringing profitable work into his office.

Considering these points in their order of presentation, the first objective should be to make certain that the method of payment for architectural service shall be fair to both parties. Also, that in developing the amount of this payment, the elements of guesswork and gambling on profits should be eliminated as far as possible. The method of reimbursing an architect for his work generally employed today is, of course, that of a flat percentage of the cost of the building to cover the cost of the architect's work and his profit. If all building problems involved a similar amount of architectural work, the percentage method would be a simple solution to the problem of charging for service. The fact remains, however, that there is a wide divergence, not only of draftsmen's time required but of requirements which affect the time the architect himself spends in connection with the work, including conferences with the owner and studying the owner's problem in order to produce a building efficient for his purpose. The usual method employed today is an attempt to set the percentage charge in accordance with these requirements. Thus in the designing of an industrial building or an office structure where every floor is the same, it is sometimes the case that an architect can work on a profitable basis for as low as 3 per cent. In the case of better class residential work, 10 per cent will sometimes scarcely reimburse the architect for his expenditure of time and money in satisfying a client.

Charges Governed by Work Performed

It is indeed quite apparent that in the design of most types of buildings, a straight percentage method of charging is not sound even though a definite attempt is made to set the percentage according to the estimated amount of work involved. When the architect places a percentage charge as a gross return for complete services, it is evident that he is to all practical purposes fixing a lump sum for his work, a sum under which he stands to gain or lose in accordance with the disposition of the client and the success of his own guesswork as to the ultimate cost of the work to him. Admitting that the percentage method of charging, on a basis of past experience, shows the architect a profit for the work he has done at the end of the year, it is still a fact that this profit has varied

considerably on individual projects and that in some instances the architect has actually worked for little or no profit, while in other instances the owner may have paid more than should be required for the work which has been done. In other words, the percentage method of charging is often one of loose averages and as such cannot be sound.

The best method for charging should be so arranged that it will include reimbursement to the architect for all his costs, including the proper proportion of overhead together with a fair net profit. From the owner's viewpoint, the payment which he makes to the architect should constitute a real investment which provides him with a building having greater utility, æsthetic or real estate value, because of the services which he has received from the architect. The desire on the part of an owner to insure a high order of design in any type of building constitutes today only one of the actuating motives in the selection of an architect. The owner seeks also practical planning and equipment which will make the building a more efficient machine for its purpose. He seeks also service, which includes a knowledge of construction methods to insure the carrying out of this project on a basis of economy, representing the lowest possible initial investment. For this complete service he pays the architect; and the architect's return should be fairly in accord with his ability to meet these requirements on the part of the owner.

It is because of this condition of demand which is developing on the part of the building public, that we are entering into a period of specialization in many architectural offices. It is for this reason that, without the sacrifice of good design, the architect must appreciate the financial and business requirements of a project and must maintain a thorough knowledge of structural methods to aid in keeping down capital investment in building construction.

The next problem involves the question of the payment of the architect's expenses and fees. In the average arrangement, made between an architect and his client, the architect is called upon to finance much of the work during the planning stages. In many instances his profit on the work which he does is not realized until the building is actually under construction and often until the building is actually finished. This fact has worked hardship on many architects, particularly in connection with large projects where considerable sums of money are required to pay drafting, overhead and general expenses. It is not fair that the architect should be called upon to bear this burden nor that he should have funds tied up indefinitely in plans which await the owner's pleasure before entering the stage of actual construction. Regardless of the method of charging, arrangements should be made by which the architect is reimbursed at least monthly for his expenses and is paid some profit on the work done.

The Money Value of Professional Skill

We have set forth as one of the requirements of a sound basis of charges for professional service that architects' profits should be commensurate with their relative skill and experience. We realize that this is opening up a subject which has many complications because there is a definite question of the value of individual service in this consideration.

In every known profession skill and experience carry their premium. In the medical profession, the specialist receives a higher rate for his time than the average practitioner. In the legal profession, able and experienced attorneys who have developed reputations along specialized lines or in general practice can and do command larger retainers than those who have not demonstrated this skill and capacity for rendering valuable legal service. In the architectural profession an attempt is often made to standardize fees regardless of the complexity of the building project involved, or the architect's ability to render real service. If a prospective building investor should ask almost any young architect as to his ability to design a building of any nature, he would receive a positive and optimistic reply that no one could serve him better. This is not a fact, excepting perhaps in the designing of moderate cost buildings where the requirements of architectural service might be comparatively simple. Otherwise, there will usually be a considerable difference in the quality and value of service — a difference which represents the relative ratio of experience and skill. This very fact explodes the theory of standard charges for architectural service. The building public recognizes this difference and pays to the young and unknown architect $100 or less for the complete plans and specifications of a moderate cost residence, but will pay 10 per cent and many extras to the architect who has a record of unusually good service. How is the young architect to get this record of good service if he cannot work at a low rate until he has demonstrated his skill and can logically charge more for his services? There is certainly a misconception of ethics in any statement or any attempted regulation which would impose a charge of unprofessional conduct or which erects an artificial barrier against this natural course through which an individual progresses to an important position in his chosen profession.

At this point there must also be brought into the discussion the question of competing for work on a basis of professional charges. Section 11 of the Canon of Ethics of the American Institute of Architects says definitely that it is unprofessional for architects to compete *knowingly* for employment on the basis of professional charges. From the ethical viewpoint this is a sound principle but it does not define the term, "to compete knowingly." It would, of course, be not only unethical but unbusinesslike for an architect knowingly to seek the

favor of an owner by offering to do work for a smaller fee than that which he knows another architect has already proposed. On the other hand, if we admit that the services of one architect are worth more than the services of another, because of the elements of skill and experience, it is evident that the architect with lesser experience should be able to work for a smaller fee on the same project without violating professional ethics. This, of course, assumes that the client knows by general reputation or otherwise that the less expensive service is inferior and that the architect admits this fact. In spite of any artificial standard of charges which architects may set up, the public in one way or another will pay in accordance with skill and experience. As a rule, the buyer of architectural service will seek this service in accordance with his requirements. If they are not complex, the owner will seek the services of an architect whom he believes capable of doing the work and who will do it at what he is pleased to term a "reasonable cost" — a price which would be less than cost with its attendant overhead. On the other hand, if the problem is complex in nature, the owner will seek the services of an experienced architect because he realizes that although he might have the work done more cheaply by an architect of less experience, the investment in the service of a specialist is logical if the operation is difficult. At this point we reach the problem of ethics between the more experienced organizations, and here we are frankly at a loss to know where to suggest limitations. This much, however, is apparent in our opinion — that an owner has a perfect right to take his problem to the office of an architect whom he believes capable of carrying out the work and to ask him on what basis of professional charges he is willing to develop the necessary plans and specifications and to give requisite supervision. If he then goes to another architect of equal standing and requests the same information, to be considered coevally with the first, it does not seem to us unethical for the second architect to refuse to do business with him.

Ethics and Architects' Charge Systems

It would be shortsighted to deliberately cut prices. If an architect is flatly asked by an owner to do work for a price less than that quoted to him by another architect, and if he is aware of this price, there is but one ethical and businesslike course, which is to turn down the proposal. On the other hand, even if he knows that another architect is receiving consideration and has also been asked to make suggestions and to quote his price for doing the work, there seems to be no reason why he should not quote a figure which represents a satisfactory profit to him. If we consider the two offices in question, we may find that because of the greater knowledge of the cost of doing work or because of several other conditions which may affect the situation, including perhaps a more careful consideration of repetitious work, the cost of architectural services given to the owner by the second office may be less than would be received from the first office. The selection would then be a matter of judgment on the owner's part as to the value of services which he may expect to receive from the individual offices. From the architect's viewpoint, this is not competing on a basis of professional fees, but is giving a quotation of price for service on the basis of production ability, which, after all, is the only sound basis of competition throughout all business and professional activities.

This condition applies particularly to commercial and industrial work, where the efficiency of the building as a machine designed for a specific purpose and its value as an investment are of paramount importance. In certain classes of institutional and residential work the element of design is of particular importance and selection of architects will usually be made on a more directly personal basis. Consequently, we find a condition developing today through which even many of the larger offices are taking work on any reputable business basis which represents a profit to them and a payment for the time of principals which they believe equals their own valuation. Similarly, we find that in spite of any standards which may have been set forth, the young architect is working for a price to the owner, which to him represents the profit which he is willing to take for his services and in consideration of his lower overhead costs.

In the foregoing paragraphs, we have outlined definite objectives toward which the fixation of methods of charging for architectural service should be directed. The next logical consideration is an examination of present-day methods of charging for professional service in order to determine the strength and weakness of various systems and to establish grounds upon which the ideal method of charging for service may be determined.

The detailed information furnished by the American Institute of Architects on this subject, together with some of the more interesting methods of charging developed by individual offices, will be considered in the second section of this article which will appear in the February, 1922, issue of The Architectural Forum. In the second part of this article there will also appear the various conclusions which have been drawn as a result of a careful survey of this field and such practical recommendations as may have been developed through a consideration of the methods employed by various architects. Before entering into this detailed consideration, however, it will be of value to outline briefly a number of the methods through which architects are receiving compensation today. There are, of course, the three methods more or less in common use: the straight percentage and the fee-plus-cost methods, both of which are recommended by the American Institute of Architects, and the salary method, a variation of the fee-plus-cost system, each of which has its advantages.

In the application of the straight percentage method, various means are employed to develop what might seem to be a fair fee. In the case of a building where there is a considerable amount of repetitious work, such as a number of floors having practically the same layout, it is the practice of some architects to deduct from the total cubic footage of the building that number of cubic feet which represent repetitious work in planning and thus arrive at an estimated cost much lower than the actual cost of the building on which the percentage fee may be applied. Others take into consideration the fact that there is repetitious work and reduce the percentage of the fee accordingly. It is quite often the case that architects quote lump sums covering the entire work involved in the planning of a given project. In effect, these architects become sub-contractors sometimes, and perhaps unknowingly, bidding for the architectural work and establishing their price on a lump sum basis which, because of the nature of the work, is often a greater gamble than that taken by the material and labor sub-contractor who bids on the actual construction. It is evident that an architect can make a lump sum proposal for his services in designing a small building when he expects to do all the work himself and considers this money as actual income for the time he may spend on the work. This is done very extensively in the speculative building field, particularly for moderate cost houses and for speculative apartment houses for which the owner wants nothing but an elevation, floor plans and a building permit. Certainly in a more complex project, when the architect maintains an organization, this form of lump sum bidding or bidding on a low flat percentage basis is often a cause for grief.

A well known architect told us not many days ago that in earlier stages of his career he tried the lump sum method of fixing a fee for his work. On a large office building project he quoted a flat sum of $25,000 to do all necessary architectural work, including supervision. The owners agreed to this price and then proceeded to make so many changes and to exert such a pressure of demand for his service and that of his organization that by the time his work was three-quarters finished, he had used up in actual expense all of the money which was to be paid for the work. In this dilemma, he went to the owners and told them the story, showing them as best he could a record of office costs. He was very fortunate in the type of people he had to deal with. They recognized the justice of his viewpoint and appropriated an additional $10,000 for the architectural work. This amount saw him through, but with a very small profit and one which was almost negligible considering the amount of his personal time given to the work. The terms of his contract were such that the owners could have forced him to go through on the original proposal, and probably three out of four owners would have insisted on this. Many other architects have had equally unfortunate experiences and have depended upon other commissions which were more profitable to bring up the average, annual earnings of the year.

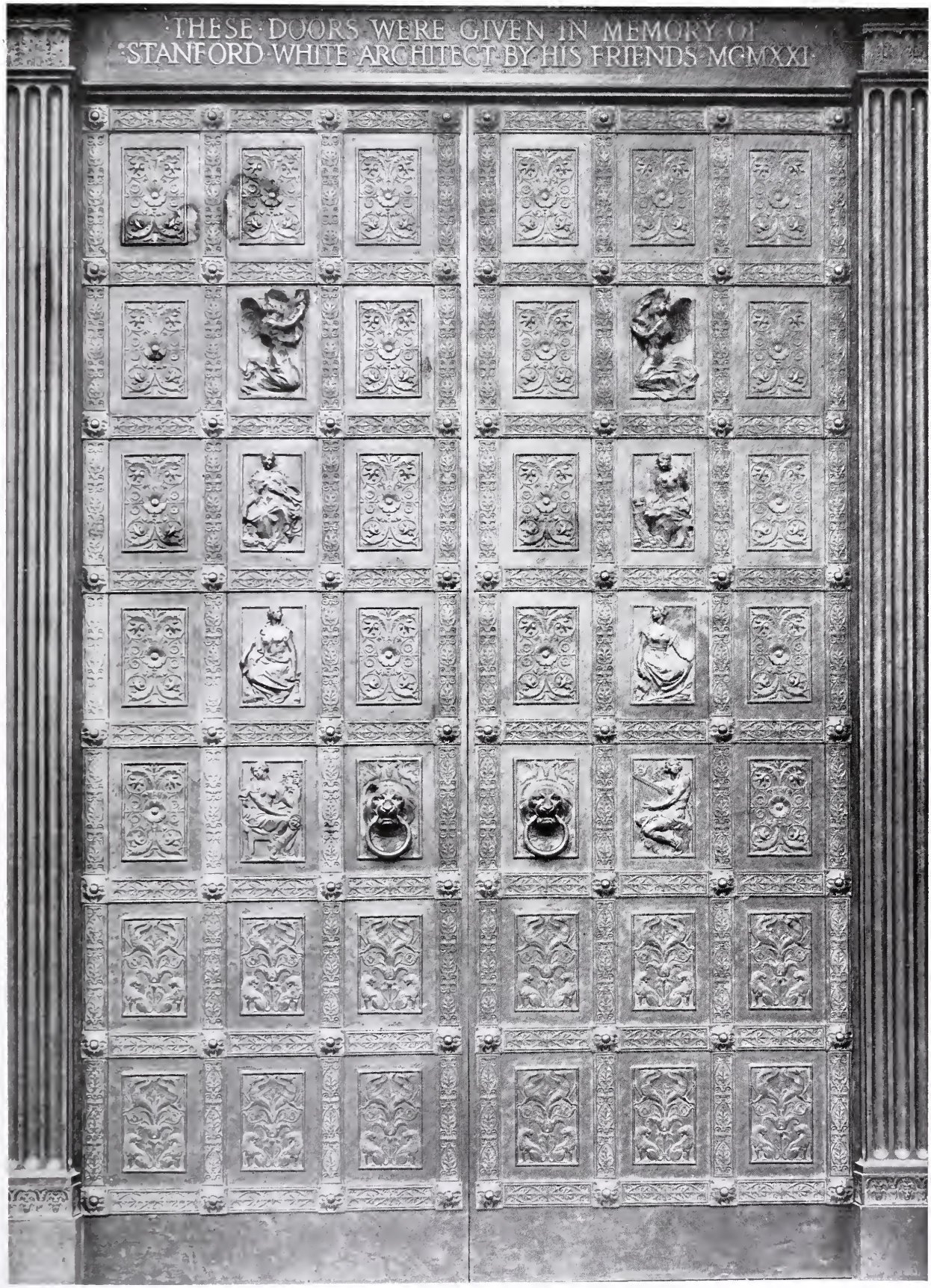
Variations of the Cost-Plus Method

Several forms of cost-plus contracts as between architects and owners have been developed and put into operation. Among these may be noted the cost-plus-fixed-fee basis on which all costs of the work in the architect's office are paid by the owner and a small net percentage of the cost of the building is given to him for profit. Among forms which the cost-plus contract may take are:

1. The contract by which the owner pays the architect his drafting cost, doubled to meet overhead, and a percentage of the total amount of this entire cost taken as profit.
2. The contract which calls for double drafting expenses to cover overhead, plus a monthly salary to the principal or principals over the estimated period covered by the designing and construction of the building.
3. The contract which calls for the payment of actual cost by the owner with the daily or hourly rate for principal's time which is spent on the work.
4. There are several other variations of the cost-plus method, including one interesting example which has come to our attention, wherein one room of the architect's office was set aside for a definite project. A rental was charged for this room during the planning period, together with salaries of an estimator, three draftsmen and a stenographer. Payment was made for principal's time at conferences as called upon by the owner and a lump sum was set aside as his profit.

It will be seen that there are numerous variations of the cost-plus method of rendering architectural service. These all have certain definite value, however, as opposed to the percentage method, particularly in that it is possible to render a monthly accounting to the owner and to be reimbursed at stated periods for all costs; that the owner pays only for the amount of work which he wants; that at any time, if the project is abandoned, the architect has actually been paid all the cost of the work to him, together with some profit and has not been forced to tie up his own money, awaiting future reimbursement.

The details of some of these methods, together with logical conclusions which may be drawn from the facts which are here presented, will prove of definite interest to many architects who may wish to revise their own financial relations with clients. In the February issue of THE FORUM, therefore, this detailed consideration will be given. Meanwhile, we shall be glad to receive correspondence from architects who have opinions to express on this subject or who may have had experiences, the knowledge of which will be of benefit.



STANFORD WHITE MEMORIAL DOORS, LIBRARY OF NEW YORK UNIVERSITY, NEW YORK

LAWRENCE GRANT WHITE, ARCHITECT

Plate Description

Banking Quarters for New York Trust Company, New York. Plates 1–3.

This bank occupies space in the American Surety Building, recently remodeled and enlarged. The basement, first, second and third floors, and parts of the sub-basement, the fourth and fifth floors, are utilized for the bank quarters, the different departments to which the public has access being grouped about the main banking room. To afford suitable height for this room the architects, Walker & Gillette, removed portions of the second floor which gave opportunity for a lofty ceiling and yet made possible the connecting of the second floor departments to the general plan.

The use of color which characterizes this large banking room marks a departure from the usual treatment of such rooms. Here the walls are formed of piers and arches made of Rosato marble, of pinkish color, quarried near Verona, Italy, with the openings defined by pilasters which, together with the soffits beneath the beams that carry the second floor across the arches, are of Blue Belge marble. The faces of these beams are ornamented with reproductions of American coins, from the "pine tree shilling" to the "buffalo nickel."

The elaborately modeled plaster ceiling, painted in bleached wood tones and slightly gilded, is supported by four columns, 30 feet high, in the center of the room, each made up of three blocks of reddish purple Levanto mottled marble and having a bronze renaissance capital. The floor pavement has a Blue Belge border and a field of alternating squares of Levanto and Tinos green marbles, separated by bands of Blue Belge. Metal work, such as screens and grilles, is of wrought iron, made after the early Italian manner and slightly oiled. The officers' platform and offices have a wainscoting of Italian walnut, 7 feet 6 inches high, which gives to their quarters the appearance of a library. The necessary vaults are placed in the basement and sub-basement.

Stanford White Memorial Doors, New York University, New York. Plates 13, 14.

There have recently been unveiled at the library of New York University a pair of bronze entrance doors, given by a group of his friends as a memorial to the late Stanford White.

Few instances are known in which so many individuals have entered into collaboration, the models for the panels of bronze being given by various sculptors who had worked with Mr. White on numerous projects. The two upper figures, typifying "Inspiration" and "Generosity," are by Andrew O'Connor. They are winged, and in higher relief than the others, in order to obtain an accent of shadow. The next two lower panels, representing "Architecture" and "Decoration," the two principal activities of Stanford White's career, are by Philip Martiny. Below these are "Painting" and "Sculpture," by Herbert Adams, and "Music" and "Drama," by A. A. Weinman, these panels typifying the allied arts in which he took an especial interest. The lions' heads are the work of Ulysses Ricci, and the inscription was modeled by Janet Scudder.

These doors, which were designed by Lawrence Grant White, of McKim, Mead & White, show a departure from the usual modern practice of casting each door in a single piece. They are, instead, built up of plates of bronze, each panel, stile and rail being cast in a separate piece. The rosettes are structurally significant, as they form the heads to the bolts which fasten the bronze to the wooden doors. This is the method used in the construction of many of the mediæval doors.

Detail of Wrought Iron Counter Screen

Banking Rooms, New York Trust Company, New York
Walker & Gillette, Architects

EDITORIAL COMMENT

THE NEED FOR CRAFT REVIVAL

NOTWITHSTANDING present widespread unemployment, there exists in the building trades the ridiculously paradoxical situation that in many of the country's important cities there is a serious shortage of plasterers, which enables those available to demand and receive in some cases as much as $18 per day. In paying this no one expects to receive equivalent value in work; he is the victim of the manipulation of the law of supply and demand to serve selfish ends. It is a warning of the end of productive building and the choking of architecture as an art unless these pernicious practices of basing everything on the dollar, which are quite as evident in modern business as in the labor unions, are promptly stopped. Curtailed production, which creates artificial scarcity, will enrich a few manufacturers in industry. The same principle in the labor unions—restricting the number of apprentices—will insure short hours, easy work and high pay for the favored few.

But what is it building? Chaos and disorganization, compared with which our past troubles will seem small. This state of affairs cannot last because it is unnatural, but if the shortsightedness of leaders makes them insist on standing in the way of readjustment to reasonable premises, no small amount of general suffering will be experienced. Not content with creating a temporary financial advantage for their members, the unions have encouraged and followed a policy of putting a premium on general inefficiency that has brought the standards of craftsmanship to a state low indeed. Simple, routine methods, regarded as matters of intuition some years ago, seem to be unknown to the present generation of workmen, and this adds largely to the responsibility of the architect who, in person or through his assistants, must now supervise the simplest details of building construction. That so small a number of plasterers are to be had is due to the restrictive regulations regarding apprentices which have been kept in force by plasterers' unions, while the poor quality of work is due partly to lack of training and partly to the pernicious system which teaches a workman to carefully conceal any particular ability he may possess and to produce as little work as possible—only as much as is necessary to insure employment, which, to be sure, is practically guaranteed by his union.

And yet architecture, more than most of the arts, is absolutely dependent for its life upon the intelligent co-operation of a trained body of craftsmen, artisans and workmen with the architect himself. If all initiative and pride in work well done are to be strangled through following ruinous economic policies, and financial costs are to remain so high that expenditure in artistic effort cannot be afforded, architecture will surely perish. The movement has fortunately not gone so far that it cannot be stopped. Architects in visiting their work under construction occasionally come in contact with individual workmen and are surprised to find that often beneath the dull, lethargic attitude which is one result of the union's dominance, there still live and struggle for expression the pride in achievement and at least something of the ability which characterized the well trained workmen a generation ago. Work occupies a large part in any man's existence, and if he cannot find enjoyment in it and will make no effort to do so, he can surely expect to find but little happiness.

We have sometimes wondered if a revival of interest in craftsmanship and an advance toward higher ideals might not be led by architects themselves. There is excellent reason why their influence might be powerful in stimulating the numerous crafts and trades upon which architecture so largely depends. Architects have always maintained a studied aloofness from the turmoil which rends the building field, and this neutrality might now serve as a fulcrum from which a friendly pressure might be exerted. Whether they will or not, architects will sooner or later be forced into a position where they must take an active interest in this absorbing question. Before they can render intelligent and impartial service, and the lack of that is all that stands in the way of an amicable settlement, architects must, however, study the subject in all its ramifications. At present labor and capital are ranged in hostile camps and there is no intermediary capable of impartially analyzing their just claims.

It is not for us to suggest the means by which real craftsmanship can be revived; it is rather our purpose to emphasize the seriousness that the matter of training possesses for the progress of architecture. Whether the present workers in the unions must be abandoned and a new group of men, trained along more intelligent lines, be formed is something that only careful consideration could determine. The chief point, however, is that architects must recognize the trust reposed in them to preserve the glorious traditions of architecture and further its development in our own day. Architects know the difficulties under which they are required to work; they know what is necessary to correct present wrong conditions, and it is certainly their duty to take an active interest and see that their suggestions and advice are used, as far as it is in their power to have them used.

DECORATION *and* FURNITURE

A DEPARTMENT
DEVOTED TO THE VARIED
PROFESSIONAL & DESIGN INTERESTS
WITH SPECIAL REFERENCE TO
AVAILABLE MATERIALS

It will be the purpose in this Department to illustrate, as far as practicable, modern interiors furnished with articles obtainable in the markets, and the Editors will be pleased to advise interestea readers the sources from which such material may be obtained

Chippendale Style Chair against Background of Pilasters and Paneling in Good Scale Relation

Portion of Side Wall of Drawing Room in Eighteenth Century English Style Showing Good Scale Relation between Architecture and Furniture

Scale of reproductions, ½ inch equals 1 foot

Francis H. Bacon & Co., Decorators

Adam Chair in Black and Gold Lacquer against Larger Scaled Background, Appropriate Because of Its Light Tone

Scale in Interior Architecture

By JOHN T. SIMPSON

PROPORTION is the relation between the different parts of a composition; scale is the relation between the sizes of all these parts and an imaginary unit of measure which is determined by our sense of the fitness of things." In these words Thomas Hastings has defined two of the most vital principles which govern good designing. A study of these definitions and of their practical application will explain why violation of simple precepts, grown out of usage and good taste, results in so many failures in architecture.

Architecture is so fundamentally dependent upon good proportion and appropriate scale that if these are provided in a design, beauty can be definitely expected even though details are left to take care of themselves. Proportion and scale have a close relation but they are essentially different things. The distinction is not obvious and confusion between the two may easily be made. A motif may have good proportions and be out of scale with its setting, but if a part of the motif be too large or too small it is both out of scale and out of proportion. Correct sense of scale is a subtle quality that can be grasped only through a complete knowledge of architectural styles and a keen, almost inherent, sense of the fitness of things. It is something intuitively sensed by the well trained architect, but in common with other results of intuition is difficult to describe.

Scale may be referred to as the quality of a composition which enables us, irrespective of its actual size, to suggest dimensions for it. This practical application of scale is daily utilized unconsciously by architect and layman alike. We readily appreciate large scale or small scale in a facade, because in our streets we have people and objects with which we associate standard sizes, and these we unconsciously use as units of measurement in viewing the building. The human figure is the normal unit of measure in determining scale. This is entirely reasonable because architecture was created by and for the use of man. The rise and run of stairs are adjusted to the human step; chairs and tables are made of certain heights for comfortable use; these sizes are recognized as correct from a utilitarian standpoint and because things fully meeting practical requirements are also generally artistic, we know they are right from an æsthetic angle, and we

Drawing Room in President's House, Columbia University, New York

A room in classic style with excellent proportions and relation in scale between architecture and furniture

McKim, Mead & White, Architects

refer to them as being in scale. Other details such as cornices, windows, doors, mantels, etc., are not fixed in size by utilitarian considerations, but the architect through his training is able to make them of such sizes that they appear reasonable to us in comparison with articles of definite sizes fixed by utility. A building or an interior is, therefore, most perfect in scale when it exhibits a natural relation in the sizes of its parts to the human figure.

Large scale is often purposely used and with good effect in exterior design to give prominence to a facade in comparison with surrounding buildings. If, however, the same building were to stand alone on a level space its imposing character would largely be lost because visual comparison of the sizes of the parts with the whole would instinctively make the building appear to us smaller than its actual size. From the standpoint of exterior design, the qualities of scale are quite generally understood. It may be said that with exteriors on the whole it is better to err on the side of large scale because small scale, even though it has the effect of increasing the apparent size of the mass, robs the detail of the vigor necessary for holding it in proper balance.

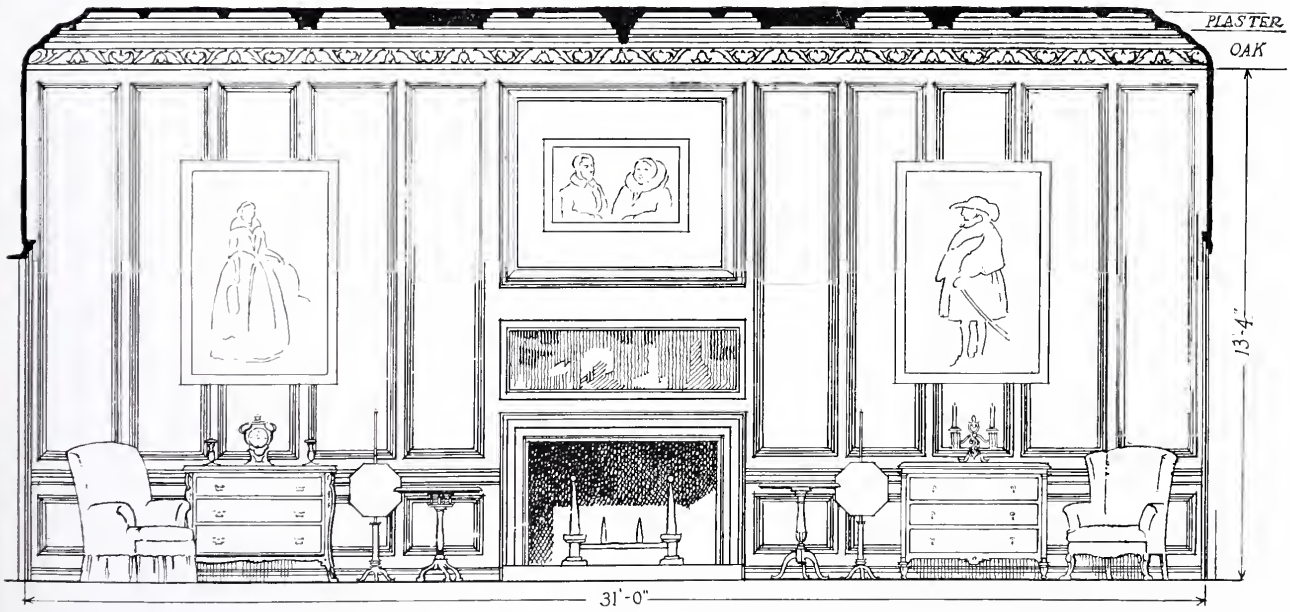
When we come to consider scale for interior architecture we have to adopt different standards, and it is in not sufficiently recognizing this distinction that so many architects produce interiors of lesser merit than their exteriors. Too frequently the interiors are spoiled by too large a scale. Here we have enclosed space, not in association with trolley cars, cabs and other street objects but with articles of furniture and intimate domestic life. This essential difference must be recognized, and for an interior to be successful a proper relation of scale must be maintained between furniture and architectural background. Much of the poor scale that is evident in our interior architecture is due largely to the forcing of motifs of other periods into modern rooms of comparatively lesser size and height. We are trying to adapt to modern requirements architectural compositions that were designed for great baronial halls, and is it any wonder that our rooms are crowded, restless and exhibit a constant struggle for dominance between furnishings and setting? In the average domestic interior half the architecture could be eliminated and the resulting gain would be immediately apparent.

The Angel Room, Quenby Hall, Leicestershire, England (1620)
Excellent scale relation between paneling and furniture

If in our search for pleasing architectural motifs in the past periods of architecture we devote our energy to studying the basic principles of proportion and scale that these rooms exhibit and forget about trying to reproduce a miniature model of whatever strikes our fancy, we will be on the right road to an interior architecture that will compare favorably with the best of the old work. The work produced by the great architects of England and France in the eighteenth century, if studied for its underlying principles, provides a wonderful source of information for the modern architect. Here he will find rooms of great proportions and vertical emphasis given by height of ceilings, but withal a relation of scale between furniture, architectural motifs and detail that in the majority of cases is nearly perfect. There has been no temptation because of the height of these rooms to increase the scale of cornices, mantels or other features. The rules of proportion determine the general mass of these features with respect to the wall spaces, but irrespective of the size of the apartment there is a uniform scale relation between the furniture and the architecture.

The French interior of the eighteenth century was a marvel of harmony between architecture, decoration and furniture and even the

EARLY 18TH CENTURY ROOM WITH GOOD SCALE IN FURNISHINGS AND ARCHITECTURE



ELEVATION OF FIREPLACE SIDE OF ROOM SHOWING SCALE RELATION OF FURNITURE

The dimensions of the room are 31 ft. by 19 ft. 4 ins. and the height of the oak paneling 13 ft. 4 ins. The scale of the ceiling ornamentation is somewhat too large, but in other respects the room is excellently scaled. The relations between panels, doors, paintings, chandelier and most of the furniture are noteworthy. Although of generous proportions the scale of the woodwork is comparatively small; the panel stiles are 3¼ ins. wide, the wainscot cap is 3½ ins. deep and all moulded parts are made up of a series of fine members.

THE OAK PARLOR, BALLS PARK, HERTFORD, ENGLAND

Dining Room, Chateau du Breau, from painting by Walter Gay *Courtesy of E. P. Dutton & Co.*
An excellent example of the charm and perfection of scale in the 18th century French interior

dress of its occupants. The artists of this period relied upon an ensemble of which we can but imagine an imperfect view. The use of color in damask wall coverings, panel mouldings and decorative over-door paintings was echoed in the costumes, the whole reflected again and again by the tall, delicately framed mirrors characteristic of the time. The charm of these eighteenth century French rooms is perhaps nowhere better illustrated than in the paintings by Walter Gay, an American artist resident in Paris. The very human and temperamental qualities of these rooms possess such an appeal that a painting with no human beings in the picture conveys a complete sense of their livable qualities. These pictures, incidentally, indicate to architects suggestions for conveying to their clients through color studies the real spirit of the room rather than the cold delineation of the architecture.

The results produced in the eighteenth century were probably due to the fact that the schools of architectural design and furniture design were developed at the same time and by artists, in many cases identical, but in all cases working on the basis of common tradition and understanding. We are not so fortunate today as to be developing styles; information concerning the past is readily available to everyone, and since we have such a wide field from which to select according to individual inclination, it is perhaps only natural that errors in the assembling of things derived from so many sources should be made.

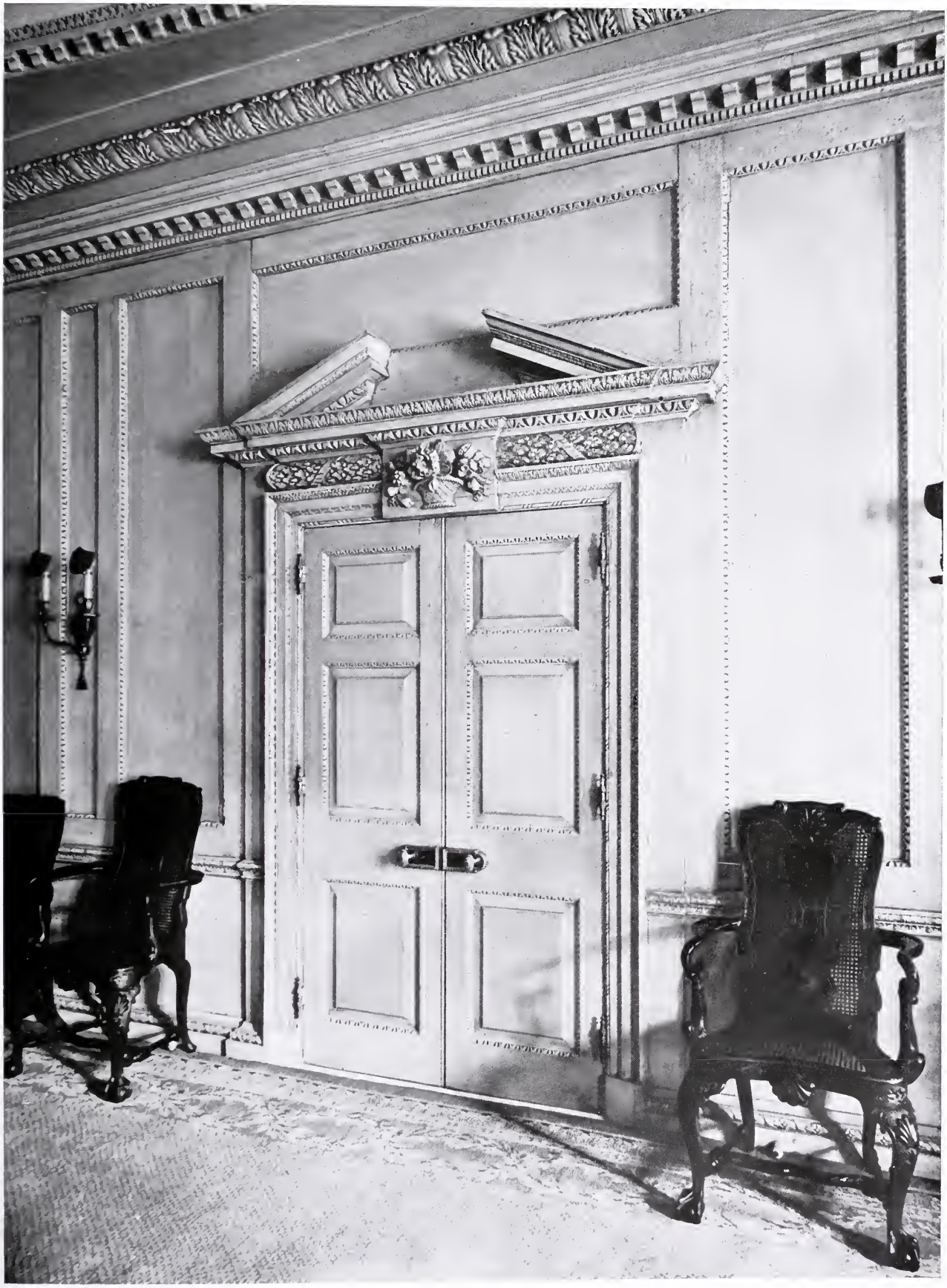
As a general statement it can truthfully be said that the modern interior is over-scaled. Motifs are frequently too large in their mass, and when not wrong in that respect, their mouldings and ornament are too heavy. There is little thought given to the sizes of panel rails, mouldings and the treatment of panels themselves. Door openings are often made too wide, and then pilasters and pediments are added to further injure scale. These may in themselves have good proportion and they may show pleasing relations of mass with the walls against which they are placed, but as soon as the average furnishings are introduced there is immediately apparent a wide gulf between architecture and movable objects.

To be successful in scale, any composition must be built up with some unit of measurement as a guide. The human figure provides this, but in the case of interiors it is well to consider also relation to articles of furniture. These may be used to establish the module of the room. If furniture of

DRAWING ROOM, HOUSE OF EGERTON L. WINTHROP, JR., ESQ., BROOKVILLE, LONG ISLAND

DELANO & ALDRICH, ARCHITECTS

A room of eighteenth century precedent influenced by the French in which there is excellent scale relation between architecture and furniture. Woodwork is ivory and general color scheme light in tone. Overdoor paintings by Albert Sterner



DOORWAY, DINING ROOM, HOUSE OF C. M. MacNEILL, ESQ., NEW YORK

FREDERICK J. STERNER, ARCHITECT

An interior doorway in Georgian style, with excellent scale relation to furniture and room. Finish is natural pine; height of door opening, 6 feet 10½ inches

Simple Motifs and Small Scale Afford Satisfactory Background in Small Room

Over-scaled Mantel in Small Living Room Emphasized by Dark Color

est factor will be scale relation. Nor are we done when we have carefully correlated furniture and architecture; elements disturbing to good scale may enter in hangings, floor coverings or upholstery. Large patterned fabrics are by no means to be eliminated; they must, however, be placed where they belong. A group of windows may be framed at the sides, and have a valance above showing a bold pattern, but sufficient plain surface should be near to give a setting. Color, and particularly contrasting color, will be important in selecting a fabric that is to be in scale. Furniture upholstery, on the other hand, is rarely successful in large pattern — there is a wrong relation in the size of the ornament and the article ornamented. Large figured fabrics should be used sparingly — perhaps only on one generously proportioned piece of furniture to provide an accent. Carpets and rugs in the average room will take their places in the room ensemble if contrasting colors and bold patterns are avoided.

Scale must be studied from three angles,— mass, detail and color. Perfection in any one relation is not sufficient; all three must receive equal consideration.

Whether in our present interiors we adhere strictly to period distinction or not, appreciation of the essentially interior qualities of scale, proportion, color and balance between decorated and plain surfaces can be achieved only through diligent comparison of the elements that make up the fine rooms of the past, and the lessons thus learned can be applied with benefit to any original work. While scale is a subtle quality and defies description, it can in a measure be tested in the preparation of drawings. If we adopt the human figure as the unit of measurement, to which our architecture is scaled, the figure of a man when drawn against an elevation should be of normal height, measured at the scale at which the drawing is made if the design is in scale. If the figure scales 8 or 10 feet, the design is over-scaled and should be restudied; if but a few feet high the fault is too small a scale and an entirely new start should be made.

It is evident that interiors, depending as they do for perfection upon such subtle qualities as scale and proportion, cannot be satisfactorily achieved with methods in use today. There must be either a distinctly co-operative spirit in the efforts of architect and decorator, or the architect must expand his activities generally to include furnishing and decoration. It was the latter method that produced the work of the eighteenth century.

Room in Early Georgian House in Ireland
An example of bad interior scale; note extreme heaviness of architectural finish and doorway, both out of scale and out of proportion

A 17TH CENTURY SPANISH DAMASK

THE influence of Spanish decoration, distinguishable in almost every phase of the prevailing mode, appears in pleasing manner in this authoritative 17th Century design, developed in heavy silk damask.

The Spanish Renaissance style, divided into three periods, and originally founded on Gothic forms, was influenced to some extent by the exuberant fancy of the Moors, producing a style both rich and poetic. Chief expositors of the classical middle period were the architects Berruguete and Herrera, the latter a pupil of Michael Angelo.

This exact reproduction of what is undoubtedly a true example of the 17th Century patterning is presented by Cheney Brothers. . . . It may be permissible to mention also that every period in the history of design—every period worthy of the name—has been subjected to painstaking research by the Master Weavers, that their looms may supply correct reproductions or adaptations in fine decorative and upholstery silks.

The Spanish damask herewith described, as well as others dealing with this period are obtainable in several color combinations.

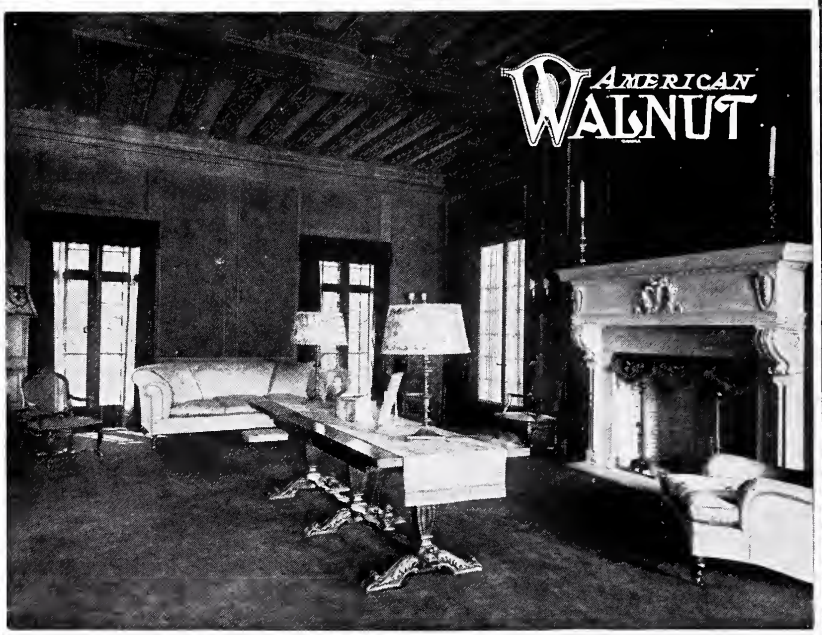
CHENEY BROTHERS

4th Avenue at 18th Street, New York

CHENEY SILKS

Keeler

THIS BORDER IS A SKETCH "FROM LIFE" OF A FINE EXAMPLE OF ARTISTIC CARVING IN AMERICAN WALNUT



Living Room in Residence of John L. Bushnell, Esq., Springfield, Ohio.
Furniture, paneling and trim in American Walnut. (Note the inlay in beamed ceiling.)
Mr. L. C. Albro, Architect.

"*Juglans Nigra*"

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When you specify American Walnut, real "*Juglans Nigra*," for interior woodwork or special order furniture, the results will do credit to your practical, as well as artistic, judgment in selecting this unrivalled "Cabinet-wood of the Ages."

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The Walnut "Brochure, de Luxe," is an interesting historical summary containing authentic engravings of many famous furniture masterpieces in Walnut. May we send it?

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Room 1000, 616 South Michigan Boulevard, Chicago

KENSINGTON FURNITURE

American Sheraton mahogany sideboard, by Kensington

THIS American Sheraton bow front sideboard has all the grace of line and symmetry of proportion typical of the Sheraton style at its best. The round tapering and reeded legs are characteristic, and the framing of the drawers and doors in a fine cock-beading may be noted as an example of the conscientious work to be expected in Kensington reproductions. The lyre motive of the carving at the top of the corner posts is interesting as indicating the beginning of the Empire influence, at first refreshing and free of the heavy vulgarity into which this style degenerated.

With lyre-back chairs, copied exactly from the fine example of Duncan Phyfe in the Metropolitan Museum, a pedestal table and double pedestal side table with drop leaves, equally characteristic of Duncan Phyfe in his early period when the Sheraton influence predominated and Empire motives in restrained use but added a new and charming note, this sideboard forms a dining room group that from a decorative standpoint could not be equaled today in antique furniture at any price.

The spirit and the character of old work live again in Kensington furniture of whatever period because it, also, is the expression of real craftsmanship.

Architects interested in completing the interiors they design with furnishings harmonious in both character and quality are cordially invited to avail themselves of the service of the Kensington Showrooms and personnel

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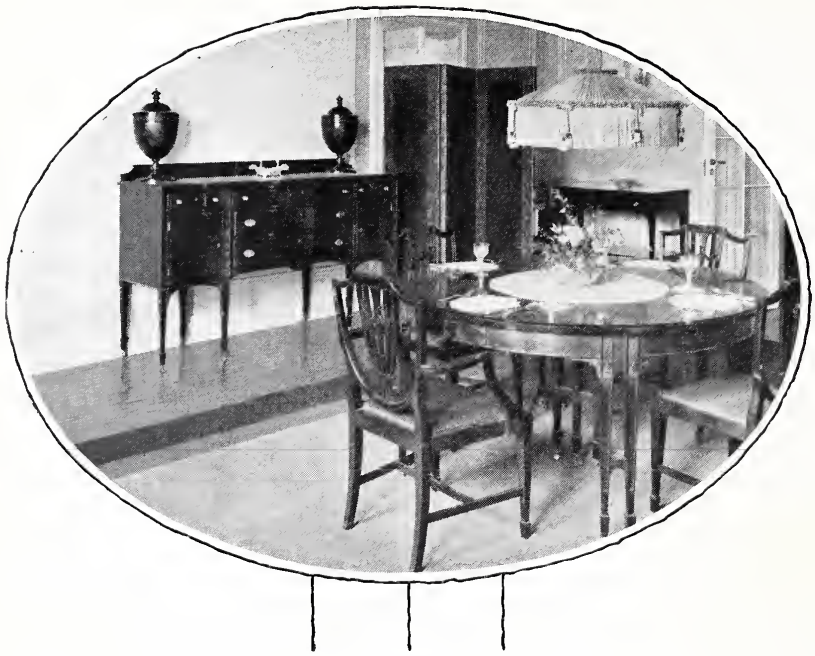
KENSINGTON MFG. COMPANY
MANUFACTURERS AND IMPORTERS
FINE FURNITURE ART OBJECTS
NEW YORK



A floor of Armstrong's Jaspé Linoleum which is a two-toned effect unlike anything you have ever seen. There is a choice of four colors, tan, gray, blue and green, any of which make charming backgrounds for fabric rugs when waxed and polished.

Lifting the Floor from the Commonplace

SOMETHING a bit more distinctive than the common, "everyday" variety of floor is required to satisfy many who will not be limited to the commonplace. Lately, there has come a realization that the floor can be made a part of the color scheme, and for this purpose, floors of Armstrong's Linoleum are being used to no little extent.

¶ There are refined designs and soft plain colorings appropriate for almost any type of interior. When selected with due regard for the rest of the appointments and used as a background for fabric rugs, they are the last word in unusual pleasing effects.

¶ Please bear in mind also that from the standpoint of utility, nothing could be more desirable than a linoleum floor. If it is cemented down over felt paper it is smooth, quiet, durable, watertight and the seams are well nigh invisible.

¶ That you may have a more complete conception of the beauty of modern linoleums, permit us to send you, without cost of course, a selection of color plates showing some really fine interiors planned with linoleum floors.

Armstrong Cork Co.

Linoleum Department *Lancaster, Pa.*

Armstrong's Linoleum

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for Every Floor (A) *in the House*

R56

SERVICE SECTION
of THE ARCHITECTURAL FORUM

Information on economic aspects of construction and direct service for architects on subjects allied to building, through members of THE FORUM Consultation Committee

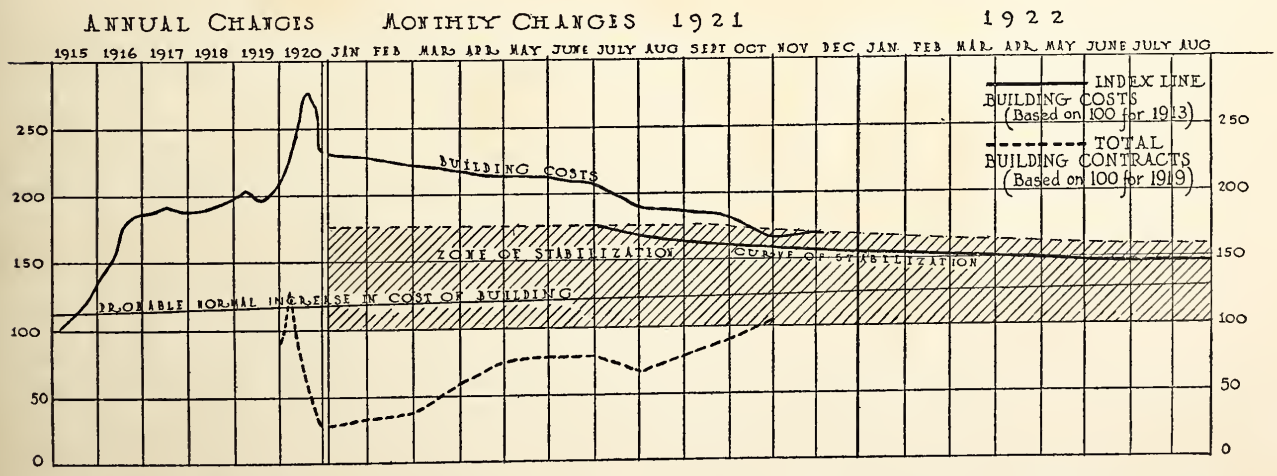
The Building Situation

IN this issue of THE ARCHITECTURAL FORUM two new service features are introduced. The first is the chart below, which will appear regularly on this page. The second is a digest of important information taken from various technical and general publications and bearing directly upon the business and financial phases of the construction industry. The chart presented below is explained in some detail in the accompanying caption. A study of this chart will show that in the late fall we entered into a period of building activity, partially as a result of increased confidence throughout the country, but particularly because of the rapid fall of the index line which shows the cost of building. For the purposes of this chart, the volume of building is represented by the money value of contracts let and shown by an index line using 1919 as the basis of 100.

This indicates clearly the state of growing public confidence in the building situation from the investment viewpoint and also the relation of the cost of building to the volume of new construction. Later we expect to have data available that will enable comparisons to be made between actual floor area of new building and its cost.

It is anticipated that the course of the index line showing amount of money invested will vary inversely with the approach of the cost index line to the curve of stabilization. When the cost index line crosses the curve of stabilization and penetrates deeper into the shaded area below, a large volume of building investment may be anticipated. The index lines on this chart are determined by reports issued by the Department of Commerce. The zone and curve of stabilization have been established by THE ARCHITECTURAL FORUM after a careful analysis of economic factors.

The building situation toward the end of December shows no radical changes since last reported. There is a slight tendency toward increased costs of some materials. The index of building material prices for November as issued by the Department of Labor shows an increase of 5 points. The cement and steel markets have fallen, due to the season. Production in lumber has been curtailed and orders as well as shipments show steady gains, making recent advances possible which have been sufficient to increase the general index figure for building materials. The ultimate disposition of wage rates for 1922 is awaited with considerable interest.



THIS chart is to be presented monthly with trend lines extended to the most recent date of available information. Its purpose is to show actual changes in the cost of building construction and the effect upon new building volume and investment as the *index line of building cost* approaches or recedes from the "curve of stabilization."

The CURVE OF STABILIZATION represents the building cost line at which investors in this field may be expected to build without fear of too great shrinkage in the reproduction value or income value of new buildings. The index line representing actual cost of building entered the ZONE OF STABILIZATION in the summer and fall of 1921. At that time the volume of new construction increased greatly. If this cost line passes *out* of the zone of stabilization, building volume will decrease materially.

The degree of the curve of stabilization is based on (a) an analysis of time involved in return to normal conditions after the civil war and that of 1812; (b) the effect of economic control exercised by the Federal Reserve Bank in accelerating this return after the recent war, and (c) an estimate of the probable normal increase in building cost.

Statistics of Building Volume and Cost

Reprinted from *Survey of Current Business,* issued by United States Department of Commerce

	NUMERICAL DATA.					BASE YEAR OR PERIOD	PERCENTAGE INCREASE (+) OR DECREASE (−).						
	September, 1921	October, 1921	Corresponding month, 1920, September or October.	CUMULATIVE TOTAL THROUGH LATEST MONTH 1921	CUMULATIVE TOTAL THROUGH LATEST MONTH 1920		Latest month from base.	Latest month from corresponding month, 1920	Cumulative 1921 from same period, 1920	July from June	August from July	September from August.	October from September.
BUILDING AND CONSTRUCTION.													
Building volume.....index numbers..	114	109	73	.....	.....	1913	+ 9 0	+ 49 3	.....	− 23.1	+ 4 4	+ 21.3	− 4.4
Building costs.....index numbers..	183	166	.....	.....	.....	1913	+ 66 0	.....	.....	− 5.4	− 2.6	− 2.7	− 9.3
Concrete factory costs.....index numbers..	157	154	265	.....	.....	1914	+ 54.0	− 41 9	.....	− 3.6	− 0.6	− 1 9	− 1 9
Contracts Awarded.													
Business buildings:													
Floor space.....thous. of sq. ft..	7,174	7,991	4,823	55,449	76,488	1919	− 14.0	+ 65 4	− 27 5	+ 8.2	+ 13.6	+ 4.0	+ 10.3
Value.....thous of dolls..	41,259	37,405	23,804	285,669	385,367	1919	+ 11 0	+ 58.6	− 25.5	− 30 7	+ 6.1	+ 17 3	− 9 0
Industrial buildings:													
Floor space.....thous of sq. ft..	2,706	3,984	5,392	28 730	118,655	1919	− 69 0	− 26.2	− 75 8	− 25.0	− 14.3	+ 16.7	+ 47.6
Value.....thous. of dolls..	11,283	18,419	26,932	141,077	534,234	1919	− 57 0	− 31 7	− 73 6	− 25 6	− 21 9	+ 4 0	+ 65.4
Residential buildings:													
Floor space.....thous. of sq. ft..	21,709	21,979	11,173	160,002	124,727	1919	+ 9 0	+ 98.2	+ 28.3	− 23.3	+ 29.0	+ 21.3	+ 0.9
Value.....thous. of dolls..	95,303	89,650	43,433	686,624	510,448	1919	+ 27 0	+108 2	+ 34 5	− 19 8	+ 34 1	+ 18.4	− 5.9
Educational buildings:													
Floor space.....thous of sq ft..	4,238	3,228	1,779	33,870	24,514	1919	+ 69 0	+ 81 7	+ 38.2	+ 16.9	+ 2.2	− 5.2	− 23.5
Value.....thous of dolls..	26,459	22,429	14,258	210,575	158,060	1919	+125 0	+ 57 3	+ 33 2	+ 22 1	− 2.1	− 5.3	− 15 4
Hospitals and institutions:													
Floor space.....thous. of sq. ft..	1,987	680	742	9,403	5,559	1919	+ 85 0	− 8 0	+ 69 1	+ 4 9	− 44.4	+125.9	− 65.7
Value.....thous of dolls .	11,878	5,200	6,186	59,296	41,529	1919	+ 59 0	− 15 9	+ 42 8	− 35 5	− 41.3	+145.9	− 56.3
Public institutions:													
Floor space.....thous. of sq. ft..	501	212	315	2,569	2,620	1919	+ 23 0	− 32 8	− 1 9	+ 56 8	− 37.0	+234 5	− 57.7
Value.....thous of dolls..	2,620	1,523	1,433	19,287	24,335	1919	+ 36 0	+ 6 3	− 20 7	+ 28.0	− 16.9	+ 75.9	− 41 9
Pub. works and pub. utilities, value, thous. of dolls	35,414	35,141	47,900	404,854	522,526	1919	− 16 0	− 27 0	− 22 5	− 11 1	− 4 5	− 20.6	− 1 2
Social and recreational buildings:													
Floor space.....thous. of sq ft.	1,990	1,383	661	15,252	11,011	1919	+ 9 0	+109 6	+ 38.5	− 11 0	+ 5.8	+ 22.7	− 30 6
Value.....thous. of dolls..	11,693	6,632	8,108	95,735	79,978	1919	− 5 0	− 18 1	+ 19 7	0 0	− 16.4	+ 37 7	− 43.5
Religious and memorial buildings:													
Floor space.....thous. of sq. ft..	1,222	928	584	8,201	4,300	1919	+109 0	+ 59 5	+ 90 7	+ 10.0	− 28.9	+ 34.8	− 24.0
Value.....thous of dolls..	7,778	5,735	5,041	53,784	36,443	1919	+ 83 0	+ 13 7	+ 47 6	+ 32.3	− 33.8	+ 25 8	− 26 5
Grand total:													
Floor space.....thous. of sq. ft..	41,702	40,436	25,469	313,975	367,074	1919	− 13.0	+ 58.2	− 14 7	− 11.7	+ 11.8	+ 18.4	− 3.3
Value.....thous. of dolls..	246,186	222,480	177,758	1,968.946	2,304,113	1919	+ 3 0	+ 24 1	− 14.5	− 6.6	+ 4 0	+ 11 7	− 10.4
Prices of Building Materials.													
Lumber:													
Southern pine, B and better *.....dolls. per M ft. b. m.	35.79	42.57	52.99	.....	.....	1913	+ 84.0	− 20.0	.....	− 0.7	+ 0.7	+ 9.9	+ 18.7
Douglas fir, No. 1, common *.....dolls. per M ft. b. m..	10.50	10.50	24.50	.....	.....	1913	+ 14.0	− 57.1	.....	0.0	− 8.8	0.0	0 0
Brick:													
Common red, New York *...dolls. per thous..	15.25	15.00	16.50	.....	.....	1913	+129.0	− 8.8	.....	+ 1.8	0.0	+ 3.1	− 1.3
Common salmon, Chicago *..dolls. per thous..	8.46	8.57	12.40	.....	.....	1913	+ 74.0	− 30.7	.....	+ 1.2	0.0	− 0 6	+ 1 8
Cement:													
Portland *.....dolls. per bbl..	1.59	1.50	1.95	.....	.....	1913	+ 55.0	− 22.9	.....	0.0	0.0	− 6.3	− 5.5
Structural steel:													
Steel beams *.....dolls per 100 lbs..	1.90	1.80	2.80	.....	.....	1913	+ 16.0	− 37 0	.....	− 4.8	− 11 5	0.0	− 5 7

SOMETHING of the building activity to be expected in 1922 may be gathered from a study of statistics in the fall months of 1921 as shown above from government data. The improvement in September and October over preceding months was particularly noticeable, and in direct evidence of the desire to build was the continuation of activity into October, when in normal years this month shows the beginning of seasonal inactivity.

The Chamber of Commerce of the United States has just completed a survey of building prospects for 1922, and its committee reports that the greatest activity will take place in the industrial states. This will comprise principally business buildings, a large part of which will be alterations and enlargements. Farm building is not expected to be very large, owing to the generally low prices offered for farm products and the fact that banks in agricultural sections are fully loaned up. Residential building is expected to count largely in the totals in all industrial sections and another large amount will be represented by educational buildings, both private and public. The many "drives" for funds undertaken during the past year will be responsible for many new college buildings in the coming year.

THE FORUM CONSULTATION COMMITTEE

A group of nationally known experts on various technical subjects allied to building, providing a direct service to architects

THE editors of THE ARCHITECTURAL FORUM have been fortunate in obtaining the co-operation of the following recognized experts who constitute THE FORUM Consultation Committee. This Committee provides a service of the greatest value to subscribers in addition to the usual editorial service, and architects who seek information on specific questions in these various fields are invited to present inquiries.

The basis on which this Committee has been organized is:

(*a*) That each Committee member shall be a representative leader in his line;
(*b*) That no Committee member has affiliations with any manufacturer;
(*c*) That no Committee member will be called upon for detailed service except by special arrangement;
(*d*) That a special editorial article on a subject represented under each of the headings below shall be prepared during the year by the Committee member.

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Mr. Cushman's firm has participated largely in the promotion and operation of many large New York buildings. His specialty is the management of office buildings.

SAFETY ENGINEERING

S. J. WILLIAMS
Secretary and Chief Engineer, National Safety Council, Chicago

Safety engineering is an important factor in the design of buildings where large groups of people congregate. The National Safety Council has investigated construction and devices with the greatest minuteness.

ELECTRICAL SCIENCE

WILLIAM L. GOODWIN
Assistant to the President and in charge of activities of the Society for Electrical Development

This Society is organized to promote accurate knowledge of the practical application of electricity. Its activities extend from the simple problems of household equipment to highly developed electrical plants. Particular attention is given the development of provision for electrical service in buildings.

REAL ESTATE

C. STANLEY TAYLOR

Widely experienced in real estate development and financing, real property law, architecture, engineering and building construction. Financial and Business Editor of THE ARCHITECTURAL FORUM and THE BUILDERS' JOURNAL.

HOTEL DESIGN AND EQUIPMENT

DANIEL P. RITCHEY

Known in the hotel field as the "hotel doctor." Mr. Ritchey, who is an engineer as well as an experienced hotel owner and manager, is qualified to answer any questions which may arise in this connection.

AUTOMOTIVE BUILDINGS

HAROLD F. BLANCHARD

For years a specialist in the layout and equipment of buildings of this type. Mr. Blanchard is a mechanical engineer and has practical knowledge of special conditions in many sections of the country through personal investigation.

FIRE PROTECTION ENGINEERING

J. D. HUNTER
Chief Engineer, Marsh & McLennan, Insurance Brokers, New York

Specialist in insurance engineering as applied to building design, construction and equipment.

FARM SCIENCE

FREDERICK WALTER IVES, B.S., M.E.

President, The Agricultural Engineering Company, Columbus, Ohio. Professor and Head of Department of Agricultural Engineering, Ohio State University.

Specialist in land drainage, soil improvement, surveys, farm arrangement for economical production, purchase of equipment and economical layout of farm buildings with special reference to interior arrangement.

LEGAL QUESTIONS

WILLIAM L. BOWMAN
Attorney, Member of the New York Bar

Specialist in legal matters pertaining to real estate and building contracts.

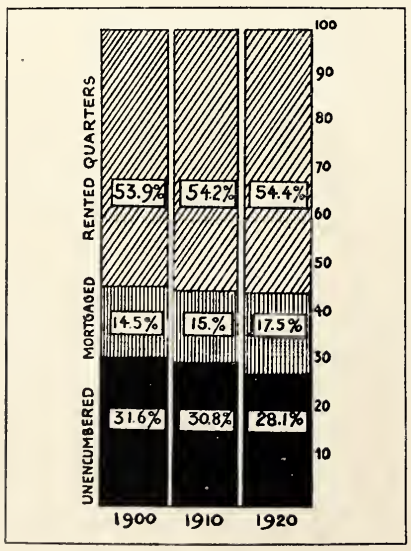
THE FORUM DIGEST

A SURVEY OF IMPORTANT CURRENT ARTICLES ON BUILDING ECONOMICS AND BUSINESS CONDITIONS AFFECTING CONSTRUCTION

The Editors of this Department select from a wide range of publications matter of definite interest to Architects which would otherwise be available only through laborious effort

PERCENTAGE OF OWNED HOMES DECREASING IN UNITED STATES

IN *The Annalist* of December 12, 1921, there is an interesting article by George H. Bruns showing the national housing trend for three decades. This chart shows the trend of home owning since 1900. This article claims that as the percentage of home owners declines, the percentage of owners whose property is mortgaged, increases. A wider adoption of the partial payment plan which ultimately satisfies the mortgage and leaves the property free and clear would remedy this situation. The advantages of a home-owning majority in a nation are so evident that the furtherance of this end would justify any practical means of accomplishment.



Housing Trend for Three Decades

STANDARDIZING CONSTRUCTION CONTRACTS

THE standardization of construction contracts, towards which far-sighted men in the industry have been looking for the last 20 years, seems about to be achieved at last through the efforts of a "conference" held in Washington recently.

This conference was composed of delegates appointed by eight national societies representing the engineers, architects and contractors of the United States, and the definite plan adopted was one which would ultimately produce a standard form of contract "agreement" which would be acceptable in all sections of the country and in all phases of this huge industry, which now ranks second only to agriculture in magnitude. Every constructor and owner who has wrestled with the intricacies of a contract, or worried over the apparently exact yet really doubtful meaning of its many complicated and legalized phrases, will approve this first attempt to frame in simple words an equitable and universal document.

SUGGESTED REMEDIES FOR DEPRESSION

IN *The Bulletin of the Associated General Contractors* for November, 1921, R. C. Marshall, Jr., General Manager of that organization, has written an extensive arti le under this heading. Some of the interesting points which he brings out are quoted here:

As to the present situation and the immediate problem of decreasing unemployment, we cannot look to agriculture, but there are several things we can look to that will tend towards a revival of business. Among those most evident are:

A. Arrangement by the government for financing the debt of the railroads, thereby putting them in a position to buy and thus start factories producing.

B. Stimulation of foreign trade.

C. Establishment of a Government Finance Corporation or Home Loan Bank to furnish money at a reasonable rate for housing and necessary private work. The government should also take action on all outstanding claims and determine them, whether appropriation for payment is available or not. Such determined claims are bankable.

D. Continued stimulation of construction work, particularly the letting of all public works, federal, state, county and city, for which appropriations are already made.

Should construction become active, what effect would it have on unemployment? For every man who is employed on a project there are four men in the country who work. A special bulletin of the Chamber of Commerce on Construction published in June of this year says that the produce of 25 per cent of the men employed in manufacturing goes to construction.

The census of 1919 shows that the products of 43 manufacturing industries go in whole or in part to construction. Thus it will be seen that the actual letting of a contract for construction sets in motion a great many of the wheels of industry. How then can construction work be started? Thirty days after the letting of a contract of approximately $100,000 we can confidently expect 20 men to be at work on the job. Not only has this happened, but between 50 and 60 men are set to work in factories in the basic manufacturing and other producing industries. Of these latter 50 or 60, the greater percentage work without regard to weather. If we can point to any means that will start $150,000,000 worth of construction work this fall, by simple arithmetic it will be seen that we can confidently expect the employment of 120,000 men by January 1.

Of industrial construction in many lines there is a surplus, yet an analysis of the situation shows that over the last decade construction is approximately $16,000,000,000 behind, made up thus:

Housing for 1,125,000 people	$5,000,000,000
Railroad construction	5,000,000,000
Public utilities	1,500,000,000
Hydro-electric development	1,500,000,000
Canals and waterways	500,000,000
Reclamation and irrigation	500,000,000
Highways	1,000,000,000
Business buildings	500,000,000
Docks, warehouses	500,000,000

It will be noted that there are left out of this tabulation several classes in which there will undoubtedly be some construction, but I cannot find authority for saying that they will assume sufficient proportions to include them.

With the housing necessities we are all more or less familiar. As to the railroads, it was stated by both Mr. Harriman and Mr. Hill since 1914 that $5,000,000,000 was needed for their proper expansion. This situation has been so repeatedly explained that it has become an accepted fact. Why the country should be so generally lacking in necessary facilities, it is difficult to ascertain. But this lack is creating a most pressing need and since this need exists it seems that we might as well turn to it as a proper source of expected activity, once it can be begun.

BUILDING SITUATION AS SHOWN BY FEDERAL RESERVE REPORTS

CLEVELAND DISTRICT. Building operations that showed such a reassuring recovery during the month of September are moving along with a fair amount of speed and present indications are that the activity will continue through the winter months.

There has been a better demand for building materials. The completion of many buildings of a residential character has had a noticeable effect on stocks, particularly of the lower grades. Inquiries are becoming more general and there is a greater tendency among dealers who have been buying from hand to mouth to replenish their stocks to something like normal conditions.

The reductions in wages and cost of materials made early in the summer have resulted in increased house building operations in Cleveland and vicinity.

NEW ENGLAND STATES. The total value of contracts awarded for new construction in New England during October, which amounted to $21,700,000, was the largest for any month in 1921 and was 21 per cent above that of October last year. In fact, the New England Federal Reserve District showed a larger gain between September and October than any other district in the United States.

MINNEAPOLIS DISTRICT. In nine cities of the Ninth Federal Reserve District the number of permits granted during October for building of all kinds receded only 2 per cent from the September figure and the valuation of permits actually increased 5 per cent between September and October. This change in the volume and value of building from September shows the same tendency that was exhibited last year, and was more satisfactory than the showing made in 1919 when both the number and valuation of permits fell off in October. As compared with October a year ago, the figures for October this year show a much larger volume of building.

CHICAGO DISTRICT. The building situation in Chicago, which, during the whole year, has been awaiting stabilized conditions in order that it might resume an activity that would satisfy the existing demand, is still in a state of confusion and of relative inactivity. While quite a large volume of building has been going on for this time of the year, it has not been proportionate to the demand that actually exists and the new work undertaken is mostly for smaller projects. The main development in the situation has been a bringing out of the attitude of the conflicting forces and of the issues at stake. A citizens' committee has been formed to uphold the principles formulated in the decision of Judge Landis, whether these are opposed by contractors or labor unions. The open shop is used to combat those unions that refuse to comply with the decision.

SAN FRANCISCO DISTRICT. Construction activity in this district during October passed all records both in the number and the value of building permits issued and continued the rapid increase in the volume of building operations which began last July. Building permits issued in 20 principal cities of this district during October, 1921, numbered 11,442 with an estimated valuation of $23,333,741, exceeding the previous record month of September, 1921, by 373, or 3.3 per cent in number, and by $3,198,748, or 15.8 per cent in value. Compared with October, 1920, the figures for October, 1921, represent an increase of 2,982, or 35.2 per cent in number and of $8,965,832, or 62.4 per cent in value. Again, comparing October, 1921, with the same month last year, increases occurred in all reporting cities with the exception of Boise, Ogden, Phoenix, San Jose, Seattle and Stockton. The greatest increase was reported from Sacramento (261.8 per cent) and the greatest decrease from Phoenix (71.4 per cent).

KANSAS CITY DISTRICT. October building permits in 20 cities of this district numbered 2,992 and the estimated cost of these buildings was placed at $8,472,038. This gives October the high record for the year in the estimated cost of buildings for which permits were issued. This is a 74.3 per cent gain in activity over the corresponding month last year. The high activity of building, coming at the end of the year, is very gratifying as it gives encouragement for a larger spring activity. Several of the cities report a large amount of building in prospect for early next year, the building of new homes claiming the larger share. A summary of the reports of building permits issued during October in these cities follows:

	Permits	Est. Value	Per c't Change
Kansas City, Mo.	546	$2,711,600	166.6
Wichita, Kans	358	1,176,542	343.9
Denver, Colo.	587	1,033,700	182.2
Oklahoma City, Okla	298	879,837	91.0
Tulsa, Okla	178	723,150	8.8
Omaha, Nebr	193	572,640	—9.2
St. Joseph, Mo.	105	192,903	212.6
Topeka, Kans.	121	173,840	44.8
Lincoln, Nebr	70	122,880	—23.1
Kansas City, Kans	76	114,825	199.7
Muskogee, Okla.	36	111,069	—3.3
Pueblo, Colo	101	102,472	—6.8
Enid, Okla.	41	100,500	3.1
Okmulgee, Okla	34	97,750	—21.6
Hutchinson, Kans.	36	93,125	.....
Casper, Wyo.	83	92,060	—79.9
Colorado Springs, Colo.	81	53,319	—49.4
Cheyenne, Wyo	22	49,880	56.1
Leavenworth, Kans	15	35,700	70.0
Joplin, Mo.	11	34,246	183.2
Total, October, 1921	2,992	$8,472,038	* 74.3
Total, October, 1920	1,648	4,859,938	

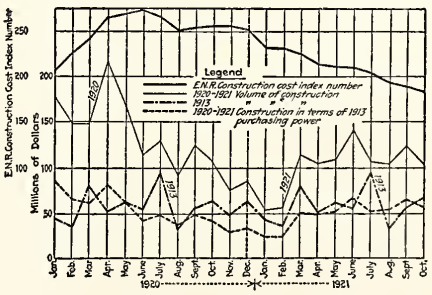
*Percentage computed on cities reporting for October of both years.

1922 A BETTER CONSTRUCTION YEAR

IN the December, 1921, issue, THE ARCHITECTURAL FORUM presented the result of a survey of future building activity as carried out through architects' offices. This, with a presentation of facts regarding entry into the zone of stabilization in building costs, developed the prediction that 1922 would be a year of considerable activity and would mark the definite upturn in the construction field. It is interesting to note that the *Engineering News-Record* (November 24, 1921), in an article under the heading "Construction Industry Has Been Waiting for Steady Prices," arrives at the same conclusion from different lines of argument. Here is the information on this subject as presented in this article:

It is agreed that except for industrial works the country is underbuilt. It is generally believed that 1921 is an off year for construction. A definite reason for this paradox is the price situation.

Prices have fallen steadily since the peak in the summer of 1920. The *Engineering News-Record* Construction Cost Index Number shows this decline —fairly evenly downward in 1921. The chart giving the cost index number also carries the monthly volume of contracts let on all classes of engineering construction in 1920, 1921 and 1913.



Comparison of the actual volume of contracts let in 1920 and 1921 with 1913 —as differing from a mere comparison of amounts of money—may be made by using the cost index number. By this means the actual volume of construction in 1920, computed from the total of contracts let, was 9 per cent less than the 1913 volume. Construction, or contracts let, in 1921 to Nov. 1 is 15 per cent less than in the ten months of 1913. This means that the amount of construction this year is 85 per cent of the amount in 1913.

Uncertainty as to future prices has been a major factor in this falling off of construction. Construction cost has declined 39 per cent since the peak in June, 1920, and is now about 66 per cent above the 1913 level. These figures include also the cost of labor. For the entire country common labor has fallen from 64 cents per hour to an average of

45 cents. In certain sections rate-cutting has been radical, while elsewhere, as in New York, peak rates are still in force. Common labor can be hired in the South for as low as 15 to 20 cents per hour. The 1913 average for the country may be taken as 22 cents per hour. It is therefore probable that labor cost will continue to decline in 1922, and this will work to draw certain materials below present levels.

If prices thus continue their decline there will remain a measurable uncertainty in the construction industry. It must be borne in mind, however, that any future decline in prices will not be from a peak, but from levels that are already satisfactory in many instances. Therefore, there should not be anything like the uncertainty that has prevailed since the summer of 1920 to date. Furthermore, the volume of construction of an urgent nature is steadily swelling and a certain proportion of this must be released, irrespective of market conditions. It seems safe to predict that 1922 will be a considerably better construction year than the present, and that the years following will show the construction industry really catching up.

CO-OPERATIVE OWNERSHIP AS PRACTICED IN CHICAGO

THE *American Contractor* for November 12, 1921 reports that a recent act of the Illinois state legislature has made it possible for Chicago to put into operation a plan of co-operation in the ownership of apartment buildings that heretofore has been available only to cities in other states. This participation of the tenant in the ownership and operation of the building has for some time been an acceptable solution of the high rent problem in New York and other eastern cities.

Up to the present time in Chicago only buildings have been purchased which are already in existence. But the future holds plans for co-operative building and, with the lessened expense necessarily involved by each prospective tenant, a tremendous opportunity exists for more extensive building during the next few years. As the idea spreads and experiments prove the wisdom of the plan as well as show the needs peculiar to such a tenantry, buildings will, doubtless, be designed for this purpose and with the idea of co-operative ownership in view.

Under the plan now being used by Albert W. Swayne & Company, in Chicago, the tenant becomes owner of his apartment with the purchase of a certain number of shares of stock, the number being determined by the size of his apartment and its relation to the rest of the building.

The first of the buildings to be organized by the company was a 24-apartment building at 1458-64 Argyle street. The stock was issued by the building corporation and, as soon as it had been bought up by 24 tenants, the property became theirs. The tenants are incorporated under the laws of the State of Illinois as the Argyle Apartment Building Company. Yearly assessments, payable monthly, are made. These cover the cost of janitor service, taxes, coal, water, light, removal of garbage and ashes, interest on mortgage loan, prepayment on mortgage and miscellaneous expenses. The monthly assessment for the first year amounts to a little more than half the previous rental price of the apartment and the assessment decreases each year as the mortgage is reduced. By the time the mortgage is wholly paid off the rental for a five-room apartment will amount (at present rate of up-keep expense) to approximately $20 a month. The total of stock and assessments for five years is, in all cases, from $200 to $400 less than the sum total of rentals payable under the old system of private ownership, and the apartment belongs to the man who is paying for it.

The management of the building is in the hands of a board of directors selected by the tenant-corporation. One director is selected from each entrance of the building and one at large. Local troubles, such as lack of heat and needed repairs, are reported to the entrance director and in turn to the manager of the building who is selected annually by the directors from among the stockholders. No salary is given the directors. Decorating is done by the tenant-owner at his own expense, exactly as it would be done in his own house. The owner may sell at any time his share of the stock in the corporation, but only with the approval of the board of directors, who must put the new buyer to a test of references, reliability and desirability.

IS UNION CONTROL OF BUILDING DOOMED IN CHICAGO?

UNION control of building in Chicago is doomed, in the opinion of those who are in a position to know, if the citizens' committee stands by its decision to make contractors and unionists alike carry out the provisions of the award made by Judge Landis several months ago regarding wage schedules and working conditions in the building trades. This fact was brought out in a meeting December 1 in Chicago of about 25 secretaries and executive officers of construction interests and material associations, constituent members of the National Federation of Construction Industries by John J. O'Leary of the Citizens' Committee for the Enforcement of the Landis Award. Mr. O'Leary outlined the work accomplished in which he indicated that both unionists and contractors who are refusing to abide by the Landis rules of working conditions as well as wage scales were finding things difficult.

As an indication of what has been accomplished so far by the citizens' committee nearly 1500 carpenters are working in accordance with the award and in defiance of their union. They are protected by 175 guards furnished by the committee. Surveys of jobs are being made and 83 per cent of the work in Chicago is now reported operating under the Landis agreement. An apartment house builder who had all but closed a $1,000,000 bank loan was refused the money on his declaration that he proposed to ignore the Landis award. After three days' reflection he changed his mind. The majority of financial houses are behind the award. Work on the new Federal Reserve Bank building, which is one of the largest unfinished pieces of construction in the downtown district, is to be carried forward in accordance with the Landis provisions.

The committee has incorporated and proposes to stay in operation several years if necessary. A fund of $3,000,000 is being raised, to be paid in 10 per cent installments.—*Engineering News-Record*, Dec. 8, 1921.

STANDARDIZING FURNITURE TRADE TERMS

IN *Good Furniture* for December, 1921, there is presented an outline of standards recommended at recent conferences of furniture manufacturers. Architects and their clients will be interested in these suggested trade terms when the purchase of furniture is under consideration. They are:

(AA) SOLID THROUGHOUT. The term "Solid Throughout" shall apply to all furniture which is made entirely of the wood designated.

(A) SOLID EXTERIOR. The term "Solid Exterior" shall be applied to all furniture of which all the exposed parts are made of the wood designated, except case back, case bottom and mirror back in case goods, and similar exceptions in other lines to be agreed upon as they arise. The interior of the case goods or piece may be constructed of such woods as the manufacturer may consider suitable for the purpose.

(B) BUILT-UP. Furniture designated as "Built-up" shall have all exteriors made of the kind of wood designated, excepting case back, case bottom and mirror back and similar exceptions in other lines as they arise. The tops, fronts and ends may be of built-up stock.

The interior of the case goods or piece may be constructed of such woods as the manufacturer may consider suitable for the purpose. The term, "Built-up" shall be used to replace the term "veneered" heretofore used.

(C) COMBINATION. Furniture designated as "Combination" shall have the tops, drawer fronts or doors and ends of built-up stock or solid wood of the kind designated. The remainder of the case or piece to be constructed of such woods as the manufacturer may consider most suitable for the purpose. The kinds of woods used should be named in the description of the suite or piece, such as "Mahogany and Birchwood," "Walnut and Gumwood," etc.

(D) Finish. The term "Finish" shall be used only in connection with the name of the wood of which the furniture is made, such as "Gumwood, Walnut Finish"; "Birchwood, Mahogany Finish."

Such terms as "Gum-Mahogany," "Birch-Mahogany" shall not be used.

(E) Misleading Names. All furniture shall be called by the names of the woods of which it is made and which do not mislead, and not by substitute, fanciful or trade names.

(F) Imitations. Imitations of woods or grains shall be called imitations in all descriptions of such kinds of furniture.

Suggestions and criticisms should be sent to National Vigilance Committee, 110 West 40th street, New York.

TREND OF MATERIAL PRICES

In the closing issue of the year, December 31, 1921, the *American Contractor* presents a careful survey of the price movement of building materials over the past several years and in particular detail over the months of 1920 and 1921. This record of price movements is based on actual quotations for materials appearing in issues of the *American Contractor* for the period and it, therefore, presents a true picture of conditions, not influenced by theory.

A variation from previous records of this nature is the adoption of a post-war base for comparison. This base is the average price of any given material for the first 10 months of 1921, and the reasons for its adoption follow.

The main requirement for a reasonable base is that the relationship of the different materials in price be as nearly perfect as possible. This is not an easy requirement, because at any time it is natural that the prices of some materials should be temporarily out of line with others. During the first 10 months of 1921, however, there have been carried out what are most likely the final steps in a period of deflation. A test of the fairness of this period as forming a base may be had in the case of lumber. At the beginning of the year lumber had shrunk considerably in value, and during the following months it had to struggle to get a market, and although it was still quite high, the fact that it went below most of the other materials and contended with a buyer's market seems justification enough for taking this period as an index of a three years' period of activity. In general the same considerations affect the markets for the other materials, and this seems to make the 10-month period of 1921 a logical base.

The materials that were selected for record are:

1. Common brick, the price being the composite of 14 cities per 1000, delivered on the job.
2. Portland cement, the price being the composite of 14 cities per barrel (package not included), in carload lots to contractors.
3. Sand, gravel and crushed stone, the price being the composite of 14 cities for the three commodities, f.o.b. cars in carload lots at shipping point.
4. Structural steel, composite price of beams, channels, angles and tees taken as price of "shapes," and prices of plates and bars per 100 pounds, f.o.b. Pittsburgh.
5. Lumber, the price being the composite of five items of Southern pine and four items of Douglas fir, f.o.b. mill.

The prices for these several commodities have been worked out on a percentage basis, using the period of the first 10 months of 1921 as a base, and the movement is recorded in the chart on this page.

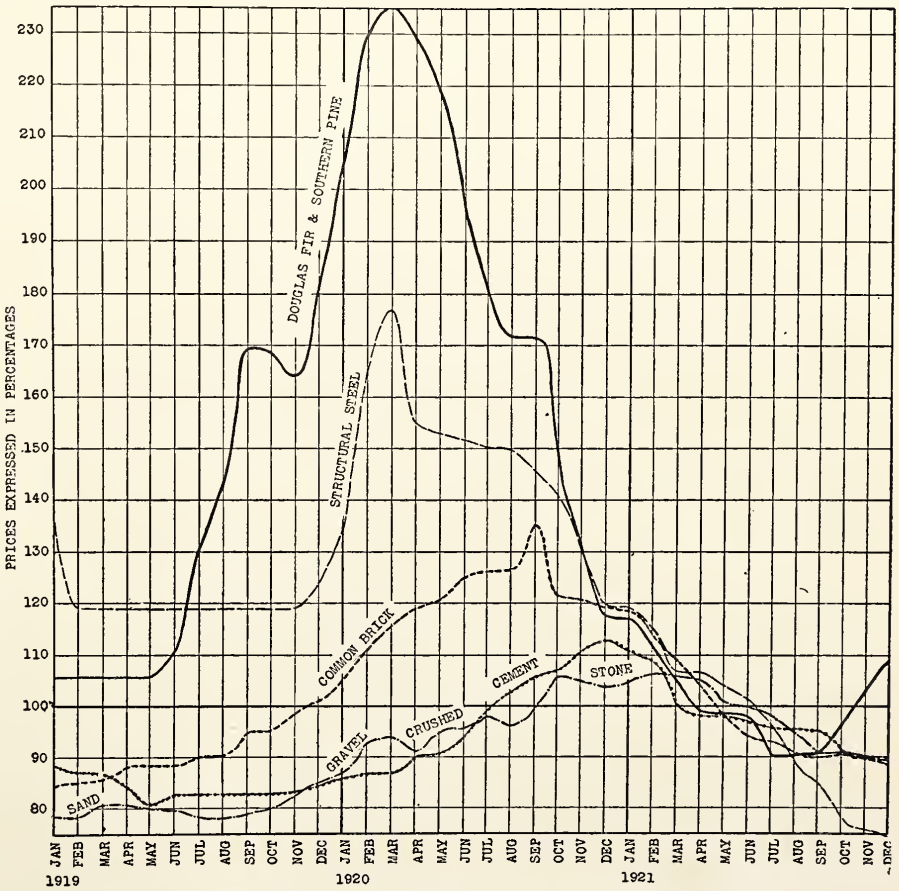
A special note is made of the fact that this comparison is simply a record of the actual movement of prices and does not in any sense attempt to consider fairness of price. This is a separate issue, involving an extensive consideration of economics of which this study takes no cognizance.

This chart shows the average national trend of prices and does not record the movement in separate localities, except as these are considered in arriving at an average. There is a marked variation in prices in different localities of the United States. This is possibly best illustrated in the case of common brick. Chicago brick, for instance, is far under the average in price, and there is a reason for this. The character of the clay of this district is such that a single brick machine can turn out 300,000 bricks a day, whereas in districts with clay of normal plasticity, a machine does well to turn out 70,000 a day; added to this, Chicago clay does not require as high a degree of temperature in the kilns.

Future Price Trends. While various economic considerations, such as circulating credit of the country, the status of world conditions and their effect upon this country will influence prices, the specific condition will be the demand for building in 1922. On the one hand this will be determined by what the potential builder thinks of the market, and on the other hand by the reaction of the material interests as they scan the amount of work contemplated or under way.

This chasing in circles is alleviated somewhat by competition, and this does exist to a great extent in the field of building materials and is particularly noticeable between such basic materials as lumber, brick, hollow tile and cement.

The article sums up, after the consideration of all these factors and in view of the suprising holdup in valuation of contract awards in the latter part of 1921, with expressing a conviction that demand for materials will be better this year than in 1921, and that the average price tendency for the year will be very moderately upward from price level at close of 1921.



Index of Material Price Changes from January 1, 1919 to December 31, 1921
Average price of first 10 months of 1921 used for base

BUILDING INDUSTRY CODE OF ETHICS

THE New York Building Congress, at a meeting at the Engineers' Club recently, ratified a Code of Ethics for the building industry which, while not mandatory in any respect, points the way to curing many of the existing evils and practices now adversely affecting the progress of the industry.

This code was prepared after many hours of intense study and research on the part of the Committee on Codes of the New York Building Congress. William J. Barney was the Chairman of this committee and his assistants were: F. A. Burdett, engineer; Charles Ewing, architect; Burt L. Fenner, architect; R. D. Kaufman, banker; F. W. Lord, sub-contractor; W. G. Luce, contractor; Roswell D. Tompkins, labor representative, and Richard A. Wolff, sub-contractor.

Although not binding in legal manner and only of such value to the industry as individuals may voluntarily make it, the members of the congress feel that the document is by far the most important attempt of this organization and one that will be of lasting benefit to all construction interests.

The Code of Ethics for the Building Industry is constructive in every article and section. It clearly points out the moral obligations of each element in the industry to his co-worker and, although in the past there have been various codes that applied specifically to single trades or professions, the code now adopted by the congress is the first ever formulated that takes in all of the elements concerned and applies a program of ethical procedure to them.

A synopsis of the code follows:

It is unethical for anyone engaged in the building industry or any of its branches:

General—Article 1

Section 1—To unduly or improperly increase the cost of work or to produce work or workmanship inferior to that contracted for.

Section 2—To falsely or maliciously injure the reputation or business of another.

Section 3—To offer or accept commissions intended to influence sales or contracts.

Section 4—To endeavor to circumvent the fair and reasonable enforcement of ordinances and safety and sanitary codes.

Section 5—To resort to or countenance "Shopping."

The Owner—Article 2

Section 1—To call for unnecessary or full estimates on tentative projects, or from unacceptable bidders, or to withhold proper facilities from those estimating.

Section 2—To refuse credit data and statement as to reality of the project.

Section 3—To deal directly with the contractor where an engineer or architect has been employed for full services, including supervision.

Section 4—To endeavor to improperly influence the architect's or engineer's decisions as to contract obligations.

The Banker—Article 3

Section 1—To fail to give due weight to the community value of improvements for which loans are desired.

Section 2—To fail to acquaint the borrower with all conditions (especially as to approval of materials and construction) under which the loan is made.

Section 3—To overload building costs with fees, commissions or bonuses not legitimately earned.

The Real Estate Broker—Article 4

Section 1—To misrepresent conditions or conceal any facts having an important bearing upon the real value of a property.

Section 2—To advise a type of development opposed to the community interest.

The Architect and Engineer—Article 5

Section 1—To act in any other than a judicial capacity in determining contract obligations; or to fail to require full performance equally by owner and contractor.

Section 2—To require a contractor to perform for him any part of the service which is generally recognized as the architect's work.

Section 3—To cover possible oversights or errors by indefinite clauses in contract or specifications.

Section 4—To withhold certificates for payment when properly due under a contract.

Section 5—To engage in the building trades.

The Contractor—Article 6

Section 1—To give, knowingly, work or workmanship inferior to that contracted for.

Section 2—To endeavor to supplant the architect or engineer with the owner.

Section 3—To submit to the owner directly, without the architect's approval and knowledge, any proposals or estimates.

Section 4—To fail to recognize his moral obligations to sub-contractors whose bids he has used in making his own proposal.

Section 5—To knowingly or carelessly underestimate the value or time of completion of any work.

Section 6—To withhold payment to sub-contractors and dealers for work or for materials for which he has received payment.

Sub-Contractors and Material Dealers—Article 7

Section 1—Knowingly to mislead through trade customs or terms as to the real cost or quality of work or materials, and to mislead as to time of completion of work or delivery of materials.

Labor—Article 8

Section 1—To restrict the quantity or quality of the output of the individual.

Section 2—To increase cost through arbitrary rules as to number of workmen employed or use of plant and equipment.

Section 3—To deny to any man the opportunity to learn and, when qualified, to practice a trade.

Section 4—To abandon the work pending the decision of disputes between trades.

LABOR RATES IN THE BUILDING TRADES

THERE is given here a tabulation of rates of wages of bricklayers, carpenters, structural iron workers and common laborers as shown in the *Engineering News-Record* of December 1, 1921.

Cities	Bricklayers	Carpenters	Structural iron workers	Common laborers
Atlanta	$0.90	$0.70	$1.00	$0.20
Baltimore	1.25	.80	1.00	.30
Birmingham	1.00	.75	1.00	.15@.25
Boston	.90	.75	.90	.40
Cincinnati	1.12½	.87½	.77½	.37½
Chicago	1.10	1.00	1.05	.35@.40
Cleveland	1.04	1.04	1.04	.57½
Dallas	1.00	1.00	1.00	.35@.45
Denver	1.37½	1.00	1.00	.35@.40
Detroit	1.00	.80	.60@.80	.50
Kansas City	1.07½	1.00	1.07½	.70
Los Angeles	1.25	1.00	1.00	.50
Minneapolis	1.00	.80	.80	.50
Montreal	.80	.60	.55	.25@.30
New Orleans	1.00	.88	1.00	.30
New York	1.25	1.12½	1.12½	.75
Pittsburgh	1.12½	1.00	1.00	Open
St. Louis	1.25	1.25	1.25	.62½
San Francisco	1.16	1.03	1.16	—.45@.55
Seattle	1.00	.80	.80@.90	.50
Philadelphia	1.00	.90	.90	.50@.60

Selected List of Manufacturers' Literature

FOR THE SERVICE OF ARCHITECTS, ENGINEERS, DECORATORS, AND CONTRACTORS

The publications listed in these columns are the most important of those issued by leading manufacturers identified with the building industry. They may be had without charge, unless otherwise noted, by applying on your business stationery to *The Architectural Forum,* 142 Berkeley St., Boston, Mass., or the manufacturer direct, in which case kindly mention this publication.

Listings in this Department are available to any manufacturer at the rate of $5 per listing per month.

ASBESTOS PRODUCTS

Asbestos Shingle, Slate & Sheathing Co., Ambler, Pa.
Ambler Asbestos Shingles. Catalog. 5½ x 8½ in. 40 pp. Illustrated.
Ambler Asbestos Corrugated Roofing and Siding. Catalog. 8½ x 11 in. 36 pp. Illustrated. Standard Purlin Spacing Tables.
Ambler Asbestos Corrugated Roofing and Siding. Catalog. 8½ x 11 in. 20 pp. Illustrated. Prices and specifications.
Ambler Asbestos Building Lumber. Catalog. 8½ x 11 in. 32 pp. Illustrated.
Engineers' Data Sheets. Catalog. 8½ x 11 in. 40 pp. Illustrated. Specifications and working sheets for Ambler Asbestos Corrugated Roofing and Siding.

Johns-Manville, Inc., Madison Ave. & 41st St., New York, N. Y.
Johns-Manville Asbestos Wood. Booklet. 3½ x 6 in. 32 pp. Illustrated. Prices, construction data. List of uses for asbestos wood.

ASH HOISTS—ELECTRIC AND HAND POWER

Gillis & Geoghegan, 541 West Broadway, New York, N. Y.
General Catalog. 8½ x 11 in. 20 pp. Fully illustrated. Contains specifications in two forms (with manufacturer's name and without). Detail ¼" scale for each telescopic model and special material-handling section.
The Man-Saving Load Lifter. 5⅞ x 8⅞ in. 8 pp. Illustrated. Describes G&G Telescopic and Non-Telescopic Hoists for handling material in factories.

BALANCES, SASH

Caldwell Mfg. Company, The, Rochester, N. Y.
Suggestion for the present-day Architect. Booklet. 6 x 9 in. 16 pp. Illustrated. Gives full-size dimensions and information for the purpose of writing specifications for Caldwell Sash Balances.

BOILERS—See Heating Equipment

BRICK

American Face Brick Association, 1151 Westminster Bldg., Chicago, Ill.
The Story of Brick. Booklet. 7 x 9¼ in. 55 pp. Illustrated. Presents the merits of face brick from structural and artistic standpoints. Tables of comparative costs.
The Home of Beauty. Booklet. 8 x 10 in. 72 pp. Color plates. Presents fifty designs for small face brick houses submitted in national competition by architects. Text by Aymar Embury II, Architect. Price 50c.
A Manual of Face-Brick Construction. Booklet. 8½ x 11 in. Textbook on construction of the brick wall and various uses of face brick. 31 colored plates of brick houses with plans. Price, $1.00.

Common Brick Manufacturers Association of America, 1309 Schofield Bldg., Cleveland, Ohio.
Brick for the Average Man's Home. Book. 8½ x 11 in. 72 pp. Color plates. Book of plans for bungalows, houses and apartments for which working drawings are available. Price $1.00.
Brick—How to Build and Estimate. Book. 8½ x 11 in. 72 pp. Illustrated. A manual for the brick builder on estimating and details of brick construction. Price 25c.

BUILDING STONE—See Stone, Building

CEMENT

Carney's Cement Company, Mankato, Minn. Booklet. 8 x 10 in. 20 pp. Illustrated. Complete information on product, showing prominent buildings in which this cement has been used.

Sandusky Cement Co., Dept. F, Cleveland, Ohio.
Medusa White Portland Cement, Stainless. Booklet. 8½ x 11 in. 48 pp. Illustrated.
Medusa Waterproof White Portland Cement. Booklet 6 x 9 in. 32 pp. Illustrated.
Medusa Review. 6 x 9 in. 18 pp. Illustrated. House organ issued bi-monthly.

CONDUIT

National Metal Molding Co., 1113 Fulton Building, Pittsburgh, Pa.
Bulletin of all National Metal Molding Products. In correspondence folder. 9½ x 11½ in.
Sherarduct. Circular. 5 x 8 in. Illustrated.
Flexsteel. Circular. 5 x 8 in. Illustrated.

CONSTRUCTION, FIREPROOF

National Fire Proofing Co., 250 Federal St., Pittsburgh, Pa.
Standard Fire Proofing Bulletin 171. 8½ x 11 in. 32 pp. Illustrated. A treatise on fire proof floor construction.

Northwestern Expanded Metal Co., 934 Old Colony Building, Chicago, Ill.
Fireproof Construction. Catalog. 6 x 9 in. 72 pp. Illustrated. Handbook of practical suggestions for architects and contractors. Describing Nemco Expanded Metal Lath.
Fire-proof Construction. Handbook. 6 x 9 in. 72 pp. Illustrated. Describing Kno-Burn expanded metal lath.

United States Gypsum Company, 205 West Monroe St., Chicago, Ill.
Pyrobar Gypsum Tile. Booklet. 8½ x 11 in. 32 pp. Illustrated. Details and specifications for fireproof partitions.
Bulletins, 8½ x 11 in., containing details and specifications for Pyrobar voids for use with reinforced concrete joist floor construction; Pyrobar roof tile; and monolithic gypsum floors and roofs.

DECORATIVE FABRICS

M. H. Rogers, Inc., 912 Broadway, New York, N. Y.
Samples of the following materials will be sent to architects upon request, to meet specific requirements:
Tapestries, velours, damasks, armures, cretonnes, tapestry panels, needlepoints, chair and sofa seats and backs.

DOORS, WINDOWS AND TRIM, METAL

Dahlstrom Metallic Door Company, 425 Buffalo Street, Jamestown, N. Y.
Architectural Catalog. 10 x 14 in. 46 pp. 11 sections. Illustrated. Catalog showing our regular styles and types of hollow metal doors and interior trim. Various types of frames and other architectural shapes also illustrated.
Architectural Portfolio. 14 x 18 in. 30 pp. Illustrated. Portfolio of various designs and types of Dahlstrom doors. Drawings and details of each style or type. This is only sent free to reliable architects.

DUMBWAITERS

Kaestner & Hecht Co., Chicago, Ill.
Bulletin 520. Describes K. & H. Co. electric dumbwaiters. 8 pp.

Sedgwick Machine Works, 151 West 15th Street, New York.
Catalog and Service Sheets. Standard specifications, plans and prices for various types, etc. 4¼ x 8¼ in. 60 pp. Illustrated.

ELECTRICAL EQUIPMENT

Frink, I. P., Inc., 24th Street and 10th Avenue, New York, N. Y.
Catalog 415. 8½ x 11 in. 46 pp. Photographs and scaled cross sections. Specialized bank lighting, screen and partition reflectors, double and single desk reflectors and Polaralite Signs.

Kohler Co., Kohler, Wis.
Kohler Automatic Power and Light 110 Volt D. C. Booklet. 5 x 7 in. 32 pp. Illustrated. Describes a standard voltage automatic, electric power and light plant for isolated homes.

Simplex Wire & Cable Co., 201 Devonshire Street, Boston, Mass.
Simplex Manual Catalog and reference book. 6¾ x 4¼ in. 92 pp. Contains in addition to information regarding Simplex products, tables and data for the ready reference of architects, electrical engineers and contractors.

Smyser-Royer Co., 1609 Sansom St., Philadelphia, Pa.
Exterior Lighting Fixtures. Catalog F. 8½ x 11½ in. Illustrated. Illustrates lamp standards, brackets, lanterns and pier lights, for exterior use.

Sprague Electric Works of the General Electric Company, 527 West 34th St., New York, N. Y.
Panel Boards and Cabinets. Catalog No. 47901. 8 x 10½ in. 70 pp. Illustrated. Panel Boards and Cabinets shown in this catalog have been selected after careful study of the general requirements. All appliances listed herein meet with the requirements of the National Board of Fire Underwriters.
Panel Circuits. Bulletin No. 47941. 8 x 10½ in. 8 pp. Illustrated. In addition to circuits for panel boards illustrated, a full line of circuits for panel boards having fuses inside branch circuit switches is also listed.
Panel Boards and Cabinets. Bulletin No. 47942. 8 x 10½ in. 16 pp. Illustrated. This bulletin covers the ever increasing demand for devices that provide maximum safety to the operator.
Dead Front Panels. Pamphlet No. 727. 5¼ x 7¾ in. 8 pp. Illustrated. A "Safety First" pamphlet covering Safety Panels and Dead Front Switchboards, for use in office buildings, factories, theaters, department stores, public buildings and in all places where the switches may be operated by persons ignorant of the changes of contact with current-carrying parts.

B. F. Sturtevant Company, Inc., Hyde Park, Boston, Mass.
Catalog No. 264. 8¼ x 10⅞ in. 54 pp. Illustrated. Gives description with diagrams of various types of motors, generators, generating sets, propeller fans, air heaters, and apparatus for special application.

ELEVATORS

Kaestner & Hecht Co., Chicago, Ill.
Bulletin 500. Contains 32 pp. Giving general information on passenger elevators for high buildings.

Otis Elevator Company, 11th Ave. & 26th Street, New York, N. Y.
Otis Push Button Controlled Elevators. Booklet. 6 x 9 in. 56 pp. Illustrated. Detailed description of Otis Push Button Elevators. Their uses in residences, stores, institutions, apartment houses, business offices and banks, etc.
Otis Gravity Spiral Conveyors. Booklet. 6 x 9 in. 56 pp. Illustrated. Gravity spiral conveyors for lowering packaged merchandise, boxed, cased and bundled goods in factories, warehouses, terminal buildings, etc.
Otis Electric Traction Elevators. Booklet. 9 x 12 in. 28 pp. Illustrated. Full details and illustrations of Otis geared and gearless traction elevators for all types of buildings.
Otis Escalators. Booklet. 6 x 9 in. 36 pp. Illustrated. Description of step and cleat type single and double file escalators (moving stairways).

Sedgwick Machine Works, 151 West 15th Street, New York.
Catalog and descriptive pamphlets. 4¼ x 8¼ in. 70 pp. Illustrated. Descriptive pamphlets on hand power freight elevators, sidewalk elevators, automobile elevators, etc.

SELECTED LIST OF MANUFACTURERS' PUBLICATIONS — *Continued from page 55*

FENCES

American Fence Construction Co., 130 West 34th St., New York.
Afco Factory Fences. Booklet. 9 x 12 in. 32 pp. Illustrated.
Residential Fences. Booklets. 7 x 2½ in. Illustrated. A series of booklets on residential fences consisting of photographs and brief descriptions.

Anchor Post Iron Works, 165 Broadway, New York, N. Y.
Catalog 51. 8½ x 11 in. 53 pp. Illustrated. Anchor Post Fences for Country Place, Factory or Farm.
Catalog 54. 8½ x 11 in. 24 pp. Illustrated. Factory Fences.

FIRE DOORS—See Doors, Windows and Trim, Metal

FIREPLACE EQUIPMENT

Covert Co., H. W., 137 E. 46th Street, New York, N. Y.
Hints on Fireplace Construction. Catalog. 5⅝ x 8½ in. 11 pp. Illustrated. Diagrams of construction and installation of Covert "Improved" and "Old Style" Dampers and Smoke Chambers. Also illustrations of Covert brass and wrought iron Fireplace Fittings.

FLOORING

Armstrong Cork & Insulation Co., 132 24th Street, Pittsburgh, Pa.
Linotile Floors. Catalog. 6 x 9 in. 40 pp. Color plates. Describes Linotile, a composition of ground cork, wood flour, linseed oil and various gums and pigments in tile form.
Armstrong's Cork Tile. Booklet 5 x 7 in. 16 pp Illustrated in color.

Armstrong Cork Co. (Linoleum Dept.), Lancaster, Pa.
Armstrong's Linoleum Floors. Catalog. 8½ x 11 in. 54 pp. Color plates. A technical treatise on linoleum, including table of gauges and weights and specifications for installing linoleum floors.
Decorative Floors Booklet. 11¼ x 15 in. 16 pp. Color plates
Armstrong's Linoleum Pattern Book, 1922. Catalog. 3½ x 6 in. 168 pp. Color plates. Reproductions in color of all patterns of linoleum and cork carpet in the Armstrong line.
Quality Sample Book. Three books. 3½ x 5¾ in. Showing all gauges and thicknesses in the Armstrong line of linoleum and cork carpets.

Carter Bloxonend Flooring Co., 1303 R. A. Long Bldg., Kansas City, Mo.
Blox-on-end Flooring. Catalog. 3¼ x 6¼ in. 20 pp. Illustrated. Describing Blox-on-end Flooring and its adaptability to concrete, wood or steel construction; also various methods of installation.
Specification Sheet. 8½ x 11 in. 4 pp. Illustrated. Standard specifications in convenient form for architects and engineers as recommended by the American Institute of Architects.

Congoleum Company, Inc. (Linoleum Dept.), Philadelphia, Pa.
"Specifications for Laying Linoleum and Cork Carpet, according to the Congoleum Company's new method compiled after years of careful research."
Linoleum Service Sheet. Gives complete printed specifications as well as detail drawings showing application in specific cases such as thresholds, staircases, under radiators, etc.
Installation and Care of Battleship Linoleum. Booklet. 6 x 9 in. 24 pp. Illustrated. Instructions as to the uses of Battleship Linoleum, its laying and care.
Pocket Pattern Book. Descriptive Booklet. 3½ x 8½ in. 64 pp. Illustrated. Shows full color reproductions of every grade and color of Linoleum, Inlaid Linoleum, Cork Carpet and also all patterns of the Gold-Seal Line.

The Marbleloid Co., 461 Eighth Ave., New York, N. Y.
The Universal Flooring for Modern Buildings. Booklet. 6¾ x 9¾ in. 32 pp. Illustrated. Describes uses and contains specifications for Marbleloid flooring, base, wainscoting, etc.
Marbleloid Flooring for Hospitals. Bulletin. 8½ x 11 in. 4 pp. Illustrated. Describes the especial features of this composition floor for hospital buildings.
Marbleloid Specifications. Booklet. 8½ x 11 in. 4 pp. Illustrated.

Muller Co., Franklyn R., Waukegan, Ill.
Asbestone Composition Flooring. Circulars. 8½ x 11 in. Description and Specifications.

Oak Flooring Manufacturers Association, 1014 Ashland Block, Chicago, Ill.
Modern Oak Floors. Booklet. 6⅛ x 9¼ in. 24 pp. Illustrated. A general book that tells the complete story on Oak Flooring.
Oak Flooring, How and When to Use it. Booklet. 3½ x 6¼ in. 16 pp. Illustrated. A small, technical book showing the general rules, standard thickness and widths, how to lay, finish and care for oak floors.

FLOOR HARDENERS

General Chemical Company, The, 25 Broad Street, New York, N. Y.
Hard-N-Tyte for concrete and mortars. Booklet. 3½ x 8½ in. 8 pp. Illustrated. Describes use of Hard-N-Tyte as application for hardening concrete floors.
The Hard-n-tyte Specification. Booklet. 8½ x 11 in. 4 pp. Gives exact specifications for concrete floor finish.
Making poor concrete floors good and good ones better. Booklet. 8½ x 11 in. 12 pp. Illustrated. Describes effects of Hard-n-tyte on concrete floors, with photographs and data.

Sonneborn Sons, Inc., L., 266 Pearl Street, New York.
Concrete and Lapidolith. Booklet. 5⅜ x 8⅛ in. 24 pp. Illustrated. Describing relation of Lapidolith chemical floor hardener to concrete construction.
Why Lapidolize? Booklet. 8½ x 11 in. 11 pp. Illustrated. Reasons why Lapidolith should be specified.
Lapidolith Specifications. Circular. 8½ x 10¾ in. 2 pp.

FURNACES—See Heating Equipment

FURNITURE

Estey Organ Company, Brattleboro, Vt.
Pipe Organs. Complete specifications and full information furnished to the architect for pipe organ to be installed in any given residence, upon receipt of plans and other particulars.

Hampton Shops, 18 East 50th St., New York, N. Y.
Glimpses from Hampton Exhibits. Brochure. 16 pp. 5 x 7½ in. Illustrated. Shows examples of Hampton work and gives one an idea of their resources. Of interest to the client as well as to the architect.

GLASS CONSTRUCTION

Mississippi Wire Glass, 220 Fifth Avenue, New York.
Mississippi Wire Glass. Catalog. 3⅞ x 8½ in. 32 pp Illustrated. Covers the complete line.

GRANITE—See Stone, Building

HARDWARE

Cutler Mail Chute Company, Rochester, N. Y.
Cutler Mail Chute Model F. Booklet. 4 x 9¼ in. 8 pp. Illustrated.

McKinney Mfg. Co., Pittsburgh, Pa.
McKinney Cabinet Hardware. Catalog. 6 x 9 in. 32 pp. Illustrated. Describes complete line of hardware for cabinet and furniture work.
McKinney Hardware for Sliding Doors. Booklet. 6 x 9 in. 18 pp. Illustrated. Describes different types of sliding door hardware.

Stanley Works, The, New Britain, Conn.
Wrought Hardware. Catalog. BJ10. 6½ x 10 in. Color plates. Shows all of the Stanley Works products made of steel from their own mills.
Eight Garages and their Stanley Garage Hardware. Booklet. 5 x 6¾ in. 32 pp. Illustrated. Illustrations and floor plans of eight typical garages that have been correctly equipped with Stanley Garage Hardware.
Ball Bearing Butts. Booklet. B8. 5 x 7¼ in. 32 pp. Illustrated. Concise description of various butts manufactured.
Stanley Specially Designed Garage Hardware. Booklet. B-50. 6 x 9 in. 24 pp. Illustrated. Detailed pictures and descriptions of various garage hardware equipment.

Vonnegut Hardware Co., Indianapolis, Ind.
Von Duprin Self-Releasing Fire Exit Devices. Catalog. 12F 8 x 11 in. 41 pp. Illustrated.
"Saving Lives." Booklet. 3¼ x 6 in. 16 pp. Illustrated. A brief outline why Self-Releasing Fire Exit Devices should be used.

HEATING EQUIPMENT

American District Steam Company, North Tonawanda, N. Y.
Bulletin No. 150-AF. 6 x 9 in. 32 pp. Illustrated. Describes the Adsco System of Atmospheric Steam Heating and explains how it saves 20 to 30% of fuel cost. Tells how to figure radiation.
Catalog No. 21-AF. 6 x 9 in. 200 pp. Illustrated. Lists and describes the full line of equipment and devices manufactured for use on underground and interior steam mains, expansion joints, steam meters, condensation meters, traps, flange fittings, angle fittings, manhole curbs, alignment guides, etc.

James B. Clow & Sons, 534 S. Franklin Street, Chicago, Ill.
Gasteam. Catalog. 6 x 9 in. 16 pp. Illustrated. New radiator using gas for fuel.

Excelso Specialty Works, 119 Clinton St., Buffalo, N. Y.
Excelso Water Heater. Booklet. 12 pp. 3 x 6 in. Illustrated. Describing the new Excelso method of generating domestic hot water in connection with heating boilers. (Firepot Coil eliminated.)

Johnson Service Company, 149 Michigan St., Milwaukee, Wis.
Regulation of Temperature and Humidity. Booklet. 11¼ x 8½ in. 64 pp. Illustrated. Describes Johnson system of pneumatic, automatic regulation of temperature and humidity, and illustrates thermostats, valves, air compressors, dampers and other parts.
Johnson Electric Thermostats, Valves and Controllers. Booklet. 6⅛ x 3½ in. 24 pp. Illustrated. Excellent plates showing electric thermostats and controllers.

Kelsey Heating Company, James St., Syracuse, N. Y.
Booklet No. 5. 4 x 9 in. 32 pp. Illustrated. A dealers' booklet showing the Kelsey Warm Air Generator Method of warming and distributing air. Gives dimensions, heating capacities, weights, kind of coal recommended, and shows the mechanical and gravity system of heating homes, churches and schools.
Monroe Pipeless Booklet. 4½ x 8 in. 20 pp. Illustrated.
Monroe Tubular Heater. Booklet. 4½ x 8 in. 20 pp. Illustrated. General Booklet giving capacities, dimensions, weights, etc.
Syracuse Pipeless Booklet. 4½ x 8 in. 12 pp. Illustrated. General Booklet, giving sizes and capacities.

Kewanee Boiler Co., Kewanee, Ill.
Kewanee on the Job. Catalog. 8½ x 11 in. 80 pp. Illustrated. Showing installations of Kewanee boilers, water heaters, radiators, etc.
Catalog No. 73. 6 x 9 in. 35 pp. Illustrated. Describes Kewanee steel power boilers with complete specifications.

Minneapolis Heat Regulator Company, Minneapolis, Minn.
The Heart of the Heating Plant. Catalog. 6 x 9 in. 20 pp. Illustrated. Describing the Minneapolis Heat Regulator, its construction, application and operation for the automatic control of temperature where coal, gas, fuel oil or street steam is used.

Page Boiler Company, The Wm. H., 141 West 36th Street, New York, N. Y.
Page Boilers. Catalog. 4½ x 8 in. 84 pp. Illustrated. Descriptions with specifications of the Volunteer Round and Monarch Square Sectional Boilers: also the Monarch Up-Draft and Down-Draft Smokeless Boiler; with method for apportioning size of boiler and radiation, and other heating data.

Smith Co., H. B., 57 Main Street, Westfield, Mass.
General Boiler and Radiator Catalog. 4 x 7 in. 90 pp. Illustrated. Giving ratings, dimensions, capacities and working pressures.
Engineer's Data Ring Book. 4 x 7 in. 125 pp. Illustrated.
Architect's and Contractor's Binders. These binders are made up of 9½ x 11 in. folders of different kinds giving dimensions, price lists, and erecting directions on the different lines of our manufacture.

B. F. Sturtevant Company, Inc., Hyde Park, Boston, Mass.
Catalog No. 230. 8¼ x 10⅞ in. 132 pp. Illustrated. Gives description and data tables of various types of heaters, also of steam traps.
Bulletin No. 227. 8⅜ x 10 11/16 in. 28 pp. Blue prints of heating and ventilating layouts in public buildings, factories, etc.
Catalog No. 1015. Book on Heating and Ventilating, complete with installations and diagrams.

SELECTED LIST OF MANUFACTURERS' PUBLICATIONS—*Continued from page 56*

HEATING EQUIPMENT—Continued

United States Radiator Corporation, Detroit, Mich.
The Complete Line. Catalog. 4¼ x 7¼ in. 255 pp. Illustrated. Contains important technical information of special interest to architects and heating engineers.
Capitol Smokeless Type Boilers. Booklet. 8½ x 11 in. 12 pp. Illustrated. Describing a new type of low-pressure heating boiler which burns soft coal without smoke.

Warren Webster & Co., Camden, N. J.
Webster Vacuum System of Steam Heating. Catalog. 8 x 10½ in. 36 pp. Illustrated. Describing the Webster Vacuum System of Steam Heating, its principles of operation, and advantages of installation.
Webster Feed-Water Heaters. Catalog. 8 x 10½ in. 28 pp. Illustrated. Describing the construction and operation of the Webster Feed-Water Heaters for steam-heating systems, power plants and industrial plants of every type.

HEAT REGULATORS—See Heating Equipment

HOISTS

Gillis & Geoghegan, 544 West Broadway, New York.
Hoists for Industrial Plants. Booklet. 6 x 8¾ in. 8 pp. Illustrated. Labor saving service in the lifting or lowering of lighter loads, through the use of G. & G. Telescopic and Non-telescopic Hoists.
Removing Ashes. Booklet. 6 x 8¾ in. 6 pp. Illustrated. Removing ashes from boiler room directly to wagon by electrically operated Telescopic Hoists.

HOLLOW TILE—See Tile, Hollow

INSULATION

Bishopric Manufacturing Co., 103 Este Ave., Cincinnati, Ohio.
For All Time and Clime. Booklet. 6 x 9 in. 48 pp. Illustrated. Describing the use of Bishopric stucco base and Bishopric plaster base.

Johns-Manville, Inc., Madison Ave. & 41st St., New York, N. Y.
Business Noise, Its Cost and Prevention. Booklet. 6 x 9¼ in. 16 pp. Illustrated. Data on correction of acoustics in offices, theaters, churches, etc.

Philip Carey Co., The, Cincinnati, Ohio.
Carey Asbestos and Magnesia Products. Catalog. 6 x 9 in. 72 pp. Illustrated.

United States Gypsum Company, 205 West Monroe St., Chicago, Ill.
Bulletin, 8½ x 11 in. Details and specifications for insulating roofs to prevent condensation.

LATH, METAL AND REINFORCING

North Western Expanded Metal Co., 934 Old Colony Building, Chicago, Ill.
Designing Data. Catalog. 6 x 9 in. 94 pp. Illustrated. Describes most efficient use of Econo Expanded Metal Reinforcing.
Formless Concrete Construction. Catalog. 6 x 9 in. 80 pp. Illustrated. Describes use of T-Rib Chanelath, a form and reinforcing for concrete.

LIGHTING SYSTEMS

The J. G. Wilson Corporation, 8 West 40th St., New York, N. Y.
Diffuselite System of Lighting. A number of leaflets and folders covering Diffuselite Paints, Blinds and Fixtures.

LUMBER

California Redwood Assn., 206 Marvin Bldg., San Francisco, Calif.
California Redwood Homes. Booklet. 6 x 9 in. 16 pp. Illustrated. Describes the use of Redwood Lumber for various places and conditions in the building of the home.

Long Bell Lumber Co., R. A. Long Building, Kansas City, Mo.
The Post Everlasting. Booklet. 10½ x 7½ in. 32 pp. Illustrated. Information regarding creosoted yellow pine fence posts, barn poles, paving blocks, etc.
Poles That Resist Decay. Booklet. 9¼ x 4 in. 16 pp. Illustrated. Poles for telegraph, telephone, high power transmission lines.

Morgan Millwork Organization, Chicago, Ill.
Building With Assurance. Book. 8½ x 11 in. 408 pp. Illustrated. Valuable to architects for the Standardized Mill Work illustrated and described.
Price Supplement. Catalog. 4 x 8 in. 96 pp. Illustrated. Prices all illustrations in "Building With Assurance" and is valuable in connection with it or by itself.

MAIL CHUTES

Cutler Mail Chute Company, Rochester, N. Y.
Cutler Mail Chute Model F. Booklet. 4 x 9¼ in. 8 pp. Illustrated.

METAL LATH—See Lath, Metal and Reinforcing

METALS

American Brass Company, Waterbury, Conn.
Illustrated pamphlet describes the use and adaptability of extruded architectural shapes to meet the architect's design.

American Sheet & Tin Plate Co., Frick Building, Pittsburgh, Pa.
Reference Book. Pocket Ed. 2½ x 4½ in. 168 pp. Illustrated. Covers the complete line of Sheet and Tin Mill Products.
Copper—Its Effect Upon Steel for Roofing Tin. Catalog. 8½ x 11 in. 28 pp. Illustrated. Describes the merits of high grade roofing tin plates and the advantages of the copper-steel alloy.
Apollo and Apollo-Keystone Galvanized Sheets. Catalog. 8½ x 11 in. 20 pp. Illustrated.
Research on the Corrosion Resistance of Copper Steel. Booklet. 8½ x 11 in. 24 pp. Illustrated. Technical information on results of atmospheric corrosion tests of various sheets under actual weather conditions.
Facts Simply and Briefly Told. Booklet. 8½ x 11 in. 16 pp. Illustrated. Non-technical statements relating to Keystone Copper Steel.
Black Sheets and Special Sheets. Catalog. 8½ x 11 in. 28 pp. Illustrated. Describes standard grades of Black and Uncoated Sheets, together with weights, bundling tables, etc.
Bright Tin Plates. Catalog. 8½ x 11 in. 16 pp.

Rome Brass & Copper Company, Rome, N. Y.
Descriptive Price List. 5 x 7 in. A leather-covered loose-leaf book listing sheets, tubes, rods, rolls, anodes, strips, extruded shapes, angles and channels, tapered tubes and hose pipes; molding, door-rail; commutator bars and segments; electrical copper bar, rivets and burs.

METAL TRIM—See Doors, Windows and Trim, Metal

MORTAR COLORS

Clinton Metallic Paint Co., Clinton, N. Y.
Clinton Mortar Colors. Booklet. 3½ x 6⅜ in. 8 pp. Illustrated. Complete description of Clinton Mortar Colors with color samples.

OFFICE SUPPLIES

Dixon Crucible Co., Joseph, Pencil Dept., 224 J. Jersey City, N. J.
Finding Your Pencil. Booklet. 6¼ x 3¼ in. 16 pp. Illustrated.
The First Five. Booklet. 3½ x 5¼ in. 10 pp. Illustrated.
A Study in Sepia. Booklet. 7 x 4½ in. 5 pp. Illustrated.

PAINTS, STAINS, VARNISHES AND WOOD FINISHES

Boston Varnish Co., Everett Station, Boston, Mass.
The Inviting Home. Booklet. 5½ x 9 in. 16 pp. Color Plates. A briefly worded book on painting for the busy architect or decorator.

Cabot, Inc., Samuel, Boston, Mass.
Cabot's Creosote Stains. Booklet. 4 x 8½ in. 16 pp. Illustrated.

Fox Co., M. Ewing, New York, N. Y.
Calcimines. Booklet. 3¼ x 6¼ in. 8 pp. Color cards.

S. C. Johnson & Son, Racine, Wis.
The Proper Treatment for Floors, Woodwork & Furniture. Booklet. 6¼ x 8⅜ in. 32 pp. Illustrated in color. A treatise on finishing hard and soft wood in stained and enameled effects; also natural wood effects.
Portfolio of Wood Panels. 5½ x 10¾ in. 14 pp. A portfolio containing actual panels of finished woods. Also contains valuable information on finishing and re-finishing floors and woodwork.

National Lead Company, 111 Broadway, New York, N. Y.
Handy Book on Painting. Book. 5½ x 3¼ in. 100 pp. Gives directions and formulas for painting various surfaces of wood, plaster, metal, etc., both interior and exterior.
Red Lead in Paste Form. Booklet. 6¼ x 3½ in. 16 pp. Illustrated. Directions and formulas for painting metals.
Came Lead. Booklet. 8¾ x 6 in. 12 pp. Illustrated. Describes various styles of lead cames.
Cinch Anchoring Specialties. Booklet. 6 x 3½ in. 20 pp. Illustrated. Describes complete line of expansion bolts.

O'Brien Varnish Co., 1121 Washington Avenue, South Bend, Ind.
That Magic Thing Called Color. Booklet. 5½ x 8½ in. 24 pp. Illustrated. Short treatise on the use of color in the home, special reference to walls and ceilings.
Architects' Specification Manual. 8½ x 11 in. 50 pp. Complete specifications for all paint products.

Ruberoid Co., The (formerly the Standard Paint Co.), 95 Madison Avenue, New York, N. Y.
Preservative Coatings. Booklet. 6 x 9 in. 15 pp. Illustrated. Presents in a concise manner the properties and uses of the Standard Paint Company's various paint preparations.

Smith & Co., Edward, P. O. Box 76, City Hall Station, New York, N. Y.
Architect's Hand Book. 4¾ x 7½ in. 24 pp. Specifications and suggestions for painting, varnishing, enameling, etc.

Sonneborn Sons, Inc., L., Dept. 4, 264 Pearl Street, New York.
Paint Specifications. Booklet. 8½ x 10¾ in. 4 pp.

Wadsworth-Howland Co., Inc., Boston, Mass.
Paints and Varnishes. Catalog. 5¾ x 8½ in. 140 pp. Illustrated. Covers the complete line.

PARTITIONS

Improved Office Partition Company, 25 Grant St., Elmhurst, L. I.
Telesco Partition. Catalog. 8¼ x 11 in. 14 pp. Illustrated Shows typical offices laid out with Telesco partitions, cuts of finished partition units in various woods. Gives specifications and cuts of buildings using Telesco.
Detailed Instructions for erecting Telesco Partitions. Booklet. 24 pp. 8½ x 11 in. Illustrated. Complete instructions, with cuts and drawings, showing how easily Telesco Partition can be erected.

The J. G. Wilson Corporation, 8 West 40th St., New York, N. Y.
Folding Partitions. Booklet. 8½ x 11½ in. 16 pp. Illustrated. Covers the field of folding partitions for churches, schools, hotels, clubs and public institutions.
Rolling Partitions, Hygienic and Disappearing Door Wardrobes. Booklet. 6 x 9 in. 32 pp. Illustrated. Describes rolling partitions, particularly in churches and schools, and wardrobes as installed in schools and public institutions.

PIPE

American Brass Company, Waterbury, Conn.
Illustrated pamphlet giving tables of weights and price-lists devoted to Brass and Copper Pipe in iron pipe and plumbers' sizes.

Clow & Sons, James B., 534 S. Franklin Street, Chicago, Ill.
Catalog "A." 4 x 6½ in. 706 pp. Illustrated. Shows a full line of steam, gas and water works supplies.

National Tube Co., Frick Building, Pittsburgh, Pa.
National Bulletin No. 11, History, Characteristics and Advantages of National Pipe. Catalog. 8½ x 11 in. 48 pp. Illustrated.

PLUMBING EQUIPMENT

American Brass Company, Waterbury, Conn.
Benedict Nickel. Illustrated pamphlet descriptive of Benedict Nickel White Metal for high-grade plumbing fixtures.

Brunswick-Balke-Collender Co., 623 S. Wabash Avenue, Chicago, Ill.
Whale-bone-ite Seat. Booklet. 3½ x 6¼ in. 4 pp. Illustrated.
Whale-bone-ite Seat. Booklet. 3½ x 6¼ in. 8 pp. Illustrated.

Clow & Sons, James B., 534 S. Franklin Street, Chicago, Ill.
Catalog "M." 9¼ x 12 in. 184 pp. Illustrated. Shows complete line of plumbing fixtures for Schools, Railroads and Industrial Plants.

SELECTED LIST OF MANUFACTURERS' PUBLICATIONS — *Continued from page 57*

PLUMBING EQUIPMENT — Continued

Crane Company, 836 S. Michigan Avenue, Chicago, Ill.
Crane Products in World Wide Use. Catalog. 5 x 9½ in. 24 pp. Illustrated.
Plumbing Suggestions for Home Builders. Catalog. 3 x 6 in. 80 pp. Illustrated.
Plumbing Suggestions for Industrial Plants. Catalog. 4 x 6½ in. 43 pp. Illustrated.

Kohler Co., Kohler, Wis.
Kohler of Kohler. 5½ x 8 in. 48 pp. Illustrated catalog. Shows complete line of plumbing fixtures.

Maddock's Sons Co., Thomas, Trenton, N. J.
Highest Grade Standardized Plumbing Fixtures for Every Need. Catalog. 5 x 7½ in. 94 pp. Illustrated. Covers the complete line.
Bathroom Individuality. Booklet. 6 x 9 in. 28 pp. Illustrated. Showing view of complete bathrooms with complete descriptions of floor plans.
Specifications for plumbing fixtures. Booklet. 9 x 12 in. 8 pp. Tables of specifications for industrial buildings, schools, apartments, hotels, etc.

Speakman Company, Wilmington, Del.
Speakman Showers and Fixtures. Catalog. 4½ x 7½ in. 250 pp. Illustrated. Catalog of Modern Showers and Brass Plumbing Fixtures, with drawings showing layouts, measurements, etc.
Toned Up In Ten Minutes. Booklet. 7½ x 10½ in. 16 pp. Illustrated. Modern Showers and Washups for Industrial Plants, showing the sanitary method of washing in running water.

Wolff Manufacturing Company, 255 No. Hoyne Ave., Chicago, Ill.
Plumbing Suggestions. Catalog. 3¼ x 6 in. 50 pp. Illustrated. Illustrating, describing and pricing Wolff Quality Plumbing Fixtures for residential installation.

PUMPS

Goulds Mfg. Co., The, Seneca Falls, N. Y.
Set of Twenty Bulletins. 7½ x 10⅝ in. 12 to 32 pp. each. Illustrated. Covers complete line of power and centrifugal pumps for all services.
Catalog "K." 6 x 9 in. 216 pp. Illustrated. Covers complete line of smaller size pumps.

REFRIGERATION

Jewett Refrigerator Company, 138 Chandler St., Buffalo, N. Y.
Refrigeration and Health — Vital Facts You Ought to Know. Booklet. 4¾ x 7¾ in. 16 pp. Illustrated. Booklet outlining the basic requirements of a good refrigerator and explaining how to use a refrigerator to obtain best results.

ROLLING DOORS AND SHUTTERS

The J. G. Wilson Corporation, 8 West 40th St., New York, N. Y.
Rolling Doors and Shutters—Steel and Wood. Catalog. 8½ x 11½ in. 80 pp. Illustrated. For engineers and architects. Covers all classes of heavy doors, for every purpose, and in great variety of materials, bronze, steel and wood. Many sheets of detail drawings.

ROOFING

American Brass Company, Waterbury, Conn.
Copper Products for Roofing Purposes. Illustrated price-list devoted to copper products, including sheets and rolls, for fabricating into leaders, gutters, flashings, shingles, etc.

Creo-Dipt Company, 1025 Oliver St., North Tonawanda, N. Y.
Architectural Service Sheets. 8½ x 11 in. Illustrated. Working drawings of construction, with standard specifications for design and construction of same.

Philip Carey Co., The, Cincinnati, Ohio.
Architects Specifications for Carey Building Material. 8½ x 11 in. 48 pp. Illustrated.

Illinois Zinc Company, 280 Broadway, New York, N. Y.
Pure Rolled Zinc. (Corrugated and Plain Sheets.) Booklet. 3½ x 6¼ in. 8 pp. Illustrated. Facts regarding adaptability of zinc for roofing. Specifications of corrugated zinc sheets. Weights per square. Comparative gauge lists.
The Roof That's Always New. Booklet. 3⅜ x 6 in. 12 pp. Illustrated. Story of Illinois Zinc Shingles, their everlasting and artistic qualities. Information regarding a complete zinc roof, shingles, starting piece, valley, ridge and hip piece.

Johns-Manville, Inc., Madison Avenue and 41st Street, New York.
Johns-Manville Colorblende Asbestos Shingles. Booklet. 3½ x 6 in. 32 pp. Illustrated. Prices, construction data and specifications.
Johns-Manville Roofing and Building Materials. Catalog. 3½ x 6 in. 24 pp. Illustrated. Describes building materials such as asbestos wood, sound deadening and insulating felts, waterproofing, etc.

Ruberoid Co., The (formerly the Standard Paint Co.), 95 Madison Avenue, New York, N. Y.
Instructions for Laying Built-up Roofs. Booklet. 8½ x 11 in. Illustrated.
Roofing Facts Worth Knowing. Booklet. 6 x 9 in. 16 pp. Illustrated.

N. & G. Taylor Company, 300 Chestnut Street, Philadelphia, Pa.
Selling Arguments for Tin Roofing. Booklet. 6¼ x 9¼ in. 80 pp. Illustrated. Describes the various advantages of the use of high grade roofing tin, gives standard specifications, general instructions for the use of roofing tin, illustrates in detail methods of application.

SEWAGE DISPOSAL

Kewanee Private Utilities, 442 Franklin St., Kewanee, Ill.
Specification Sheets. 7¾ x 10¼ in. 46 pp. Illustrated. Detailed drawings and specifications covering water supply and sewage disposal systems.

SHEATHING

Bishopric Manufacturing Co., 103 Este Ave., Cincinnati, Ohio
For All Time and Clime. Booklet. 6 x 9 in. 48 pp. Illustrated. Describing the use of Bishopric stucco base and Bishopric plaster base

STONE, BUILDING

Harrison Granite Company, 200 Fifth Avenue, New York, N. Y.
Harrison Granite Company, Clientele. 3¾ x 8¾ in. 24 pp. Illustrated. A partial list of clients with illustrations of examples of monuments and mausoleums.

Indiana Limestone Quarrymen's Association, Box 766, Bedford, Indiana.
Volume 3. Series A-3. Standard Specifications for Cut Indiana Limestone work. 8½ x 11 in. 56 pp. Containing specifications and supplementary data relating to the best methods of specifying and using this stone for all building purposes.
Vol. 1. Series B. Indiana Limestone Library. 6 x 9 in. 36 pp. Illustrated. Giving general information regarding Indiana Limestone, its physical characteristics, etc.
Vol. 27. Series B. Designs for Houses of Indiana Limestone. 8½ x 11 in. 32 pp. Illustrated. Being the best designs submitted in competition for a detached residence faced with Indiana Limestone conducted by *The Architectural Review.*

STORE FRONTS

Brasco Manufacturing Company, 5025 So. Wabash Ave., Chicago, Ill.
Brasco Catalog No. 26. 8½ x 11 in. 28 pp. Illustrated. Catalog illustrating and describing members of the Brasco and Brasco-Hester Construction. Includes copper-covered Brasco moulding and the Hester all metal moulding. The wood core of the Brasco has been creosoted and will last as long as the building.
Full-Size Details Brasco Copper Store Front Construction. 8¾ x 11 in. Complete in every particular. Show practical installation of the construction.
Full-Size Details Brasco-Hester Copper Store Front Construction. 8¾ x 11 in. This type is all metal or hollow. Has a dust regulator at the base of the plate which does not stick.

Kawneer Co., The, Niles, Mich.
Kawneer Solid Copper Store Fronts. Catalog. "K." 8½ x 11 in. 32 pp. Illustrated. Information about various members used in the pioneer Kawneer construction.
A Collection of Successful Designs. Catalog. 9¼ x 6½ in. 64 pp. Illustrated. Showing by use of drawings and photographs many types of Kawneer Solid Copper Store Fronts.

Zouri Drawn Metals Co., B. J. 10, Chicago Heights, Ill.
Architects' Catalog. 8¾ x 11¾ in. 86 pp. Illustrated. Showing a true copy of the approval of the Underwriters' Laboratories. Showing a proper glazing specification, based on the Underwriters' Report.
Catalog B. J. 8. 6 x 9 in. 68 pp. Illustrated. Key to Getting the People In.

STUCCO BASES

Bishopric Manufacturing Co., 103 Este Ave., Cincinnati, Ohio.
For All Time and Clime. Booklet. 6 x 9 in. 48 pp. Illustrated. Describing the use of Bishopric stucco base and Bishopric plaster base

STUCCO, MAGNESITE

American Materials Company, 101 Park Avenue, New York; Weed Street and Sheffield Avenue, Chicago, Ill.
Elastica, the Stucco of Permanent Beauty. Catalog. 8½ x 11 in. 32 pp. Illustrated. Treatise on composition and application of Elastica Stucco.

Muller, Franklyn R. Co., Waukegan, Ill.
Everlastic Magnesite Stucco. Booklet. 8½ x 11 in.

United States Materials Co., Weed Street and Sheffield Avenue, Chicago, Ill. See American Materials Co.

TERRA COTTA

Atlantic Terra Cotta Co., 1170 Broadway, New York, N. Y.
Questions Answered. Booklet, 7½ x 5¼ in. 32 pp. Illustrated. A synopsis of questions most frequently asked by architects in relation to terra cotta, with brief but complete answers; contains many illustrations.

National Terra Cotta Society, 1 Madison Avenue, New York, N. Y.
Standard Construction, Indexed, bound volume. 10½ x 16 in. 90 pp. 70 Illustrations. Standard forms of terra cotta construction with short article.
"The School." 10½ x 13½ in. 34 pp. 92 Illustrations. Types of school buildings with short descriptive articles. Volume I, brochure series.
"The Theatre." 10½ x 13½ in. 36 pp. 102 Illustrations. Types of theatre buildings with short descriptive articles. Volume II, brochure series.
"The Store." 10½ x 13½ in. 34 pp. 60 Illustrations. Types of store buildings with short descriptive articles. Volume III, brochure series.

Northwestern Terra Cotta Co., The, 2525 Clybourn Ave., Chicago, Ill.
Booklet. 8¼ x 11 in. 77 pp. Illustrated. Showing in a concise way the usefulness of terra cotta.

THERMOSTATS—See Heating Equipment

TILE, FLOOR AND WALL

Associated Tile Manufacturers, The, Beaver Falls, Pa.
Bring the Crowds to Your Market. Booklet. 8½ x 11 in. 16 pp. Illustrated. The use of Tile for the modern sanitary market.
Swimming Pools. Booklet. 8½ x 11 in. 32 pp. Illustrated. A handbook on swimming pools and their construction.

Norton Company, Worcester, Mass.
Alundum Safety Tile. Booklet. 5 x 8 in. 15 pp. Illustrated. Description of material and its installation.
Tests of Alundum Tile. Booklet. 5 x 8 in. 18 pp. Illustrated. Describes its composition and proves its adaptability for its innumerable purposes.

TILE, HOLLOW

Hollow Building Tile Association, Dept. 1812, Conway Bldg., Chicago, Ill.
Handbook of Hollow Building Tile Construction. 8½ x 11 in. 104 pp. Illustrated. Complete treatise on most approved methods of hollow tile building construction and fireproofing.

SELECTED LIST OF MANUFACTURERS' PUBLICATIONS — *Continued from page 59*

TILE, HOLLOW — Continued

National Fire Proofing Co., 250 Federal St., Pittsburgh, Pa.
Standard Wall Construction Bulletin 174. 8½ x 11 in. 32 pp. Illustrated. A treatise on the subject of hollow tile wall construction.
Industrial Housing Bulletin 172. 8½ x 11 in. 14 pp. Illustrated. Photographs and floor plans of typical workingmen's homes.
Natco on the Farm. 8½ x 11 in. 38 pp. Illustrated. A treatise on the subject of fire safe and permanent farm building construction.
Fireproof Buildings of Natco Hollow Tile. Booklet 8½ x 11 in. 16 pp. Illustrated. Showing the use of Natco Hollow Tile for private residences.

VALVES

Crane Co., 836 S. Michigan Ave., Chicago, Ill.
No. 50 Steam Pocket Catalog. 4 x 6½ in. 775 pp. Illustrated. Describes the complete line of the Crane Co.

Gorton & Lidgerwood Company, 96 Liberty St., New York, N. Y.
Gorton Quarter-Turn Packing-Lock Valves. Booklet. 4¼ x 7¼ in. 32 pp. Illustrated. Describing a new type of valve for all systems of steam, hot water and vacuum heating.

Jenkins Bros., 80 White Street, New York.
The Valve Behind a Good Heating System. Booklet. 4½ x 7¼ in. 16 pp. Color plates.
Jenkins Valves for Plumbing Service. Booklet. 4½ x 7¼ in. 16 pp. Illustrated.

Warren Webster & Co., Camden, N. J.
The Webster Type N Modulation Valves. Catalog. 8 x 10½ in. 8 pp. Illustrated. Describing a quick response, conveniently operated, and simple radiator supply valve.
The Webster Sylphon Trap. Booklet. 8 x 10½ in. 12 pp. Illustrated. Explaining the importance of the properly operating radiator return trap.

VENETIAN BLINDS AND AWNINGS

The J. G. Wilson Corporation, 8 West 40th St., New York, N. Y.
Booklet. 6 x 9 in. 32 pp. Illustrated. Describes the application of these light-regulating devices, with many photographic reproductions of homes, schools, hotels, clubs and institutions where these products are used.

VENTILATION

Globe Ventilator Co., Dept. P., Troy, N. Y.
Globe Ventilator's Catalog. 6 x 9 in. 32 pp. Illustrated.

WALL BOARDS

Carey Co., The Philip, Cincinnati, Ohio.
Carey Board for Better Building. Catalog. 6 x 9 in. 32 pp. Illustrated.

United States Gypsum Company, 205 West Monroe St., Chicago, Ill.
Walls of Worth. Booklet. 8½ x 11 in. 24 pp. Illustrated. Describes Sheetrock, the fireproof wall board, its advantages and uses.

WATER FILTERS

The Graver Corporation, East Chicago, Ind.
The Water Supply for Swimming Pools. Bulletin 500. 12 pp. 8½ x 11 in. Illustrated. Re-filtering or re-circulating method of purifying and heating water for swimming pools. Contains data on the design, construction and operation of pools. Fully illustrated. Also literature on all types of Water Softeners.
Graver Vertical Pressure Filters. Bulletin 502. 8½ x 11 in. 12 pp. Illustrated. Contains full data on capacities, design, coagulant apparatus, efficiency, etc., o filters. Also literature on all types of water-softening equipment.

WATERPROOFING

Ruberoid Co., The, 95 Madison Ave., N. Y.
Impervite. Circular. 8½ x 11 in. 4 pp. Illustrated. An integral waterproofing compound for concrete, stucco, cement, mortar, etc.

Sandusky Cement Co., Dept. F., Cleveland, Ohio.
Medusa Waterproofing. Booklet. 6¾ x 9 in. 38 pp. Illustrated.

WATER SOFTENERS

Permutit Company, The, 440 Fourth Ave., New York, N. Y.
Permutit-Water softened to No (Zero) Hardness. Booklet. 8½ x 11 in. 32 pp. Describing the original Zeolite process of softening water to zero hardness. An essential for homes, hotels, apartment houses, swimming pools, laundries, textile mills, paper mills, ice plants, etc., in hard water districts.

WINDOW HARDWARE

The Kawneer Company, Niles, Mich.
Kawneer Simplex Windows. Catalog. 8½ x 10½ in. 16 pp. Illustrated. Complete information, with measured details, of Kawneer Simplex Weightless Reversible Window Fixtures, made of solid bronze. Shows installations in residences and buildings of all sorts.
Detail Sheets and Installation Instructions. Valuable for architects and builders.

Samson Cordage Works, Boston, Mass.
Catalog. 3½ x 6¼ in. 24 pp. Illustrated. Covers complete line.

Smith & Egge Mfg. Co., The. Bridgeport, Conn.
Booklet. 6¾ x 9 in. 42 pp. Illustrated. Covers a complete line of chains, hardware and specialties.

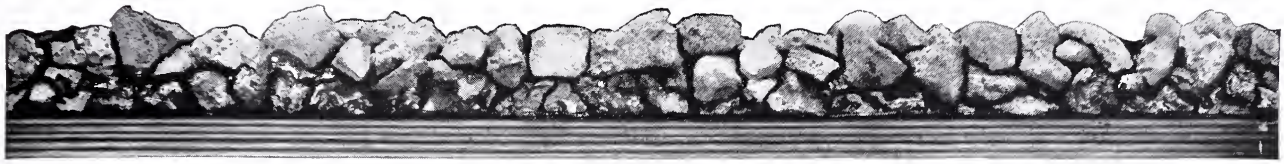
WINDOWS, CASEMENT

Crittall Casement Window Co., 2703 East Atwater Street, Detroit, Mich.
Catalog No. 18. 9 x 12 in. 56 pp. Illustrated.

Hoffman Mfg. Co., Andrew, 900 Steger Building, Chicago, Ill.
Hoffman Casements. Architects' Portfolio. 8½ x 11 in. Loose-leaf. Large scale working details for mill-work and installation.
F. S. Details 20 x 23 in. and 15 x 22 in. Working details for mill-work and installation.
Hoffman Casements Catalogue. 7 x 8½ in. 16 pp. Illustrated.

Hope & Sons, Henry, 103 Park Avenue, New York.
Catalog. 12¼ x 18½ in. 30 pp. Illustrated. Full size details of outward and inward opening casements.

WOOD — See Lumber



Cross-section of a Barrett Specification Roof. Note the uniform distribution of Pitch between the layers of Felt

Right Construction is *Half* the Roof—

STUDY the illustrations at the right. In these the successive steps in the building-up of a Barrett Specification Roof over concrete are graphically shown. The Barrett Specification describes in detail the manner in which the roof shall be laid, because *right construction is just as important as the use of right materials.*

The Barrett Specification Roof for flat or nearly flat roofed buildings consists of several alternate layers of Specification Pitch and Specification Felt, with a surface covering of gravel or slag. These materials are used because 60 years' experience has proved —

— that no other bitumen has the weather-resisting properties of this high grade pitch;
— that no other kind of felt has the lasting tensile strength of this carefully selected felt;
— that no other surfacing material renders a roof so highly fire-resistant as gravel or slag which serves the further purpose of holding in place the extra-thick *poured* top coat of Barrett Specification Pitch.

The concrete roof-deck is heavily mopped with a uniform coating of Barrett Specification Pitch

Right: Laying the Barrett Specification Tarred Felt on the pitch seal coat. Four plies with pitch in between are laid over the entire roof surface, each ply overlapping three-fourths of the preceding ply

Left: Mopping on the Barrett Specification Pitch. Each layer of felt is hermetically sealed to the adjoining layer by the pitch waterproofing. In no spot do the layers touch each other

Have your roofing contract call for the 20- or 10-year Surety Bond Guaranty. This is issued free of charge through the U. S. Fidelity and Guaranty Company of Baltimore. Then you will be sure that Barrett Specification materials will be applied, in sufficient quantities and by proper methods. For all Barrett Specification Bonded Roofs are constructed under the watchful eye of an experienced Barrett inspector who is present on the job to see that the Specification is strictly complied with.

Before specifying or closing contract for a Barrett Specification Roof, be sure to read carefully all the stipulations in the Specification.

Below: Pouring final coat of hot Barrett Specification Pitch and embedding thick wearing surface of gravel or slag after entire roof has received four plies of felt and pitch

Full details regarding these Bonded Roofs and copies of The Barrett Specifications sent free on request

The Barrett Company

New York, Pittsburgh, Nashville, Bangor, Columbus, Omaha, Chicago, Detroit, Syracuse, Washington, Richmond, Philadelphia, New Orleans, Seattle, Johnstown, Latrobe, Houston, Boston, Birmingham, Peoria, Lehanon, Bethlehem, St. Louis, Kansas City, Atlanta, Youngstown, Elizabeth, Denver, Cleveland, Minneapolis, Duluth, Milwaukee, Buffalo, Cincinnati, Dallas, Salt Lake City, Toledo, Baltimore, Jacksonville

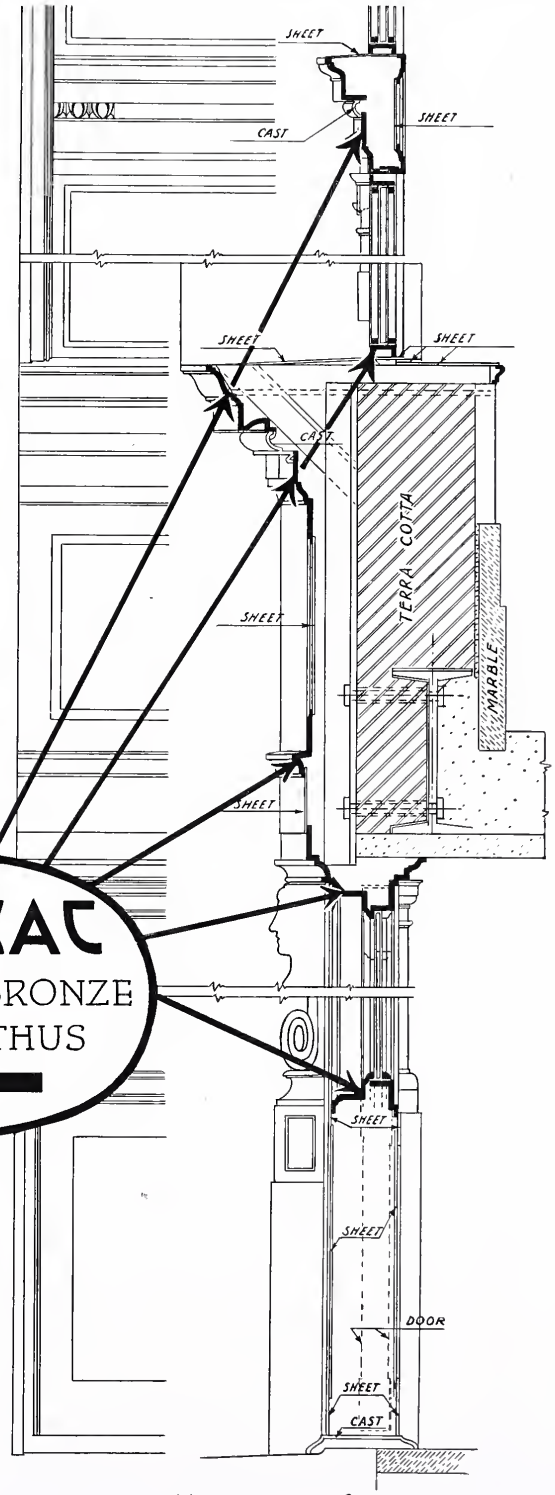
THE BARRETT COMPANY, LIMITED: Montreal, Toronto, Winnipeg, Vancouver, St. John, N. B., Halifax, N. S.

Barrett Specification Roofs

Bonded for 20 and 10 Years

ARCHITECTURAL SHAPES

The accompanying photographs and drawings show how AMBRAC Extruded Architectural Bronze has been employed in the entrance to the main office of The American Brass Company, Waterbury, Conn. Architects, Trowbridge & Livingston. Architectural shapes fabricated by the Architectural Bronze Department of The Gorham Company from AMBRAC Extruded Architectural Bronze Sections, manufactured by The American Brass Company.



VERTICAL SECTION

AMBRAC
EXTRUDED BRONZE
SHOWN THUS

The extrusion process reproduces with the utmost fidelity the clean, sharp lines so essential to the creation of high character architectural effects in bronze window frames, doors, screens and wickets, etc.

Sample shapes illustrating the character of work which is produced in AMBRAC Extruded Bronze can be obtained by interested architects and fabricators upon request from the Ansonia, Conn. and the Kenosha, Wis. branches of The American Brass Company.

THE AMERICAN BRASS COMPANY

ANSONIA BRANCH
ANSONIA - CONN.

WATERBURY, CONN. U. S. A.

KENOSHA BRANCH
KENOSHA - - WIS

AMERICAN INDUSTRIAL BANK

Hartford, Conn.

Godley & Sedgwick, *Architects*
Wm. F. O'Neall, *Gen. Contractor*

Passenger Elevator Doors, Bi-Parting

Freight Elevator Doors—Three-Leaf—Two-Speed

ELEVATOR DOORS OF STANDING

There are two essentials in the manufacture of elevator doors. They must be fireproof and easy to operate. Of course they must also be sanitary and artistic.

If real high grade workmanship and materials are put into hollow metal elevator doors, it is only possible to turn out a fireproof door, at the same time provide sanitation, beauty and low cost of upkeep.

Because this rule has been followed since the founding of the DAHLSTROM METALLIC DOOR COMPANY, first class hollow metal doors have been turned out and standing the tests of time for seventeen years.

DAHLSTROM METALLIC DOOR COMPANY

425 Buffalo Street - Jamestown, N. Y.

New York
25 Broadway

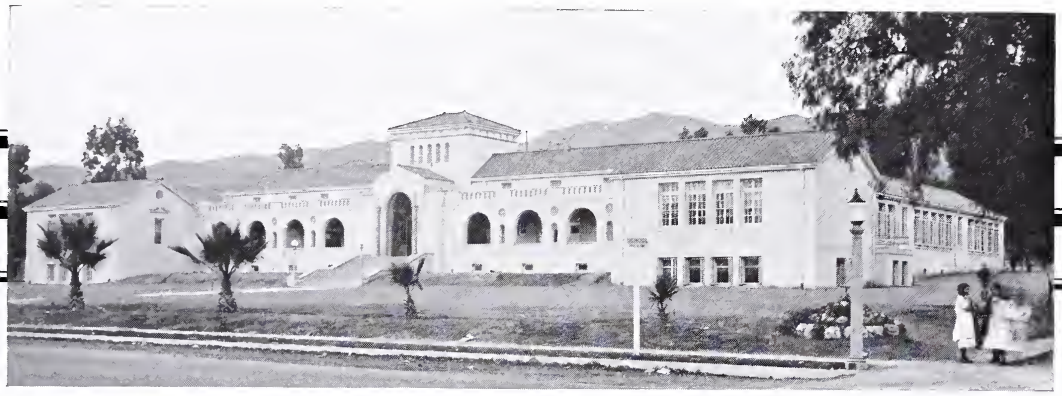
Chicago
19 So. LaSalle St.

Detroit
1331 Dime Bank Bldg.

Representatives in All Principal Cities

DAHLSTROM PATENT DOOR ARTISTIC EVERLASTING SANITARY & FIREPROOF

2-Inch Partitions of Metal Lath and Plaster Save Space and Lower Cost



For interior construction of schools and all kinds of public buildings 2-inch solid partitions made of

Kno-Burn

METAL LATH

and plaster are proving decidedly popular because of the saving in floor space — saving in materials and labor of erection — the rapidity of erection — and the strong, fire-safe construction that results.

The small diamond-shaped mesh of Kno-Burn permit a perfect key and prevent undue waste of plaster. This 24-gauge steel lath is light enough to be easily cut and shaped and by reason of the size and shape of its mesh assures rigidity with the minimum amount of steel.

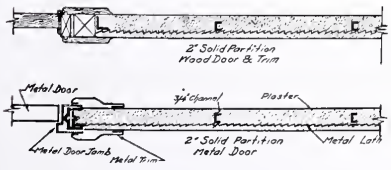
Kno-Burn Metal Lath "THE STEEL HEART OF PLASTER"

NORTH WESTERN EXPANDED METAL COMPANY

Manufacturers of Kno-Burn Metal Lath, Econo, Presteel Lumber, etc.

934 OLD COLONY BLDG., CHICAGO

Non-Bearing 2-Inch Solid Partitions



A 2-inch solid partition of Kno-Burn lath and plaster is usually constructed of steel studs. It has become a general method now to use a light ¾-inch to 1 inch channel on 12-inch to 16-inch centers and this framing in turn is lined with 24-gauge Kno-Burn lath and plastered on both sides to an overall depth of 2 inches. These channels may be bent at ends, nailed or anchored to floor and ceiling line.

The weight of the 2-inch solid partition averages from 18 lbs. to 20 lbs. per square foot. This class of partition occupies less space and is lighter than any other practical fireproof partition of equal strength. The sound-deadening properties have shown up well. In a test held some years ago in Chicago, the 2-inch solid partition showed up surprisingly well and ranked very high in sound-deadening properties.

Send for "Fireproof Construction" containing complete details.

Floor Information at Your Finger Tips

New Architectural Service Sheet—Free

With the increasing use of Battleship Linoleum and Cork Carpet as flooring in office buildings, theatres, churches, and public institutions of all kinds, has come a real need for an improved, standardized method of laying these materials,—a method that insures satisfactory maximum *service on the floor.*

At the request, and with the cooperation, of many leading architects and flooring contractors, The Congoleum Company has developed the *Gold-Seal* Method of Laying which, we believe, definitely fills this need.

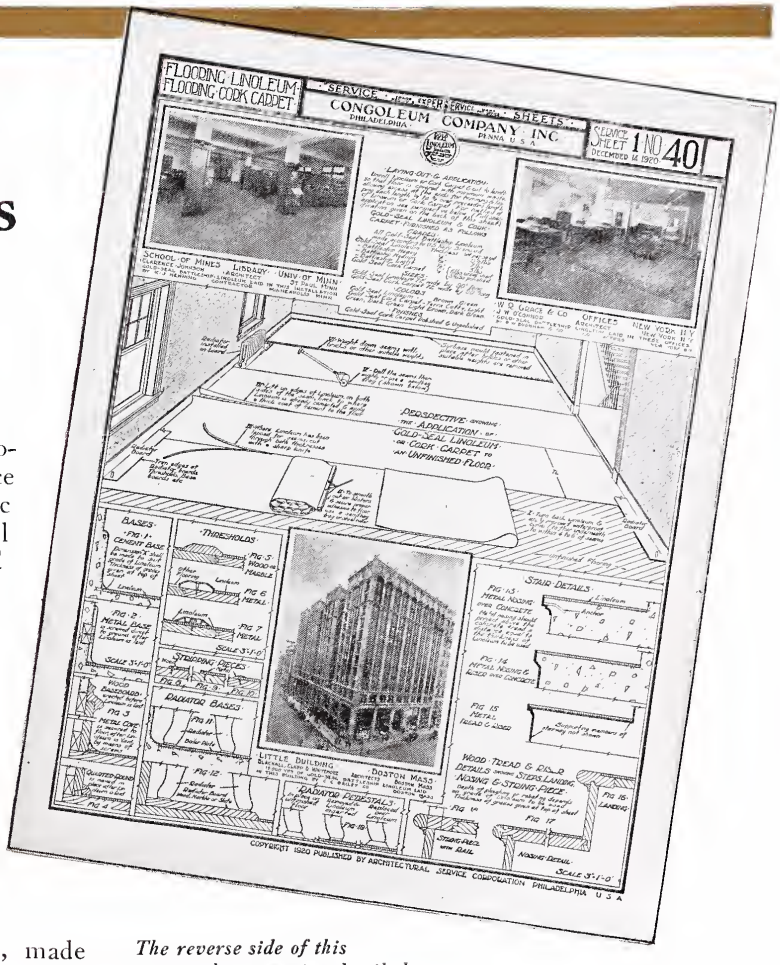
While, in a sense entirely new, the *Gold-Seal* Method is not experimental, for it is a composite of the best features of the different methods now employed, made after long and careful study of the results obtained.

To present this new Method of Laying in the form most convenient for ready reference and filing by architects, it has been incorporated in an Architectural Service Sheet (Sheet 1, No. 40) issued by the Architectural Service Bureau of Philadelphia. Free to architects.

This Service Sheet gives complete printed specifications, as well as detail drawings showing application in specific cases, such as on thresholds, stair-cases, under radiators, etc.

This is the only Service Sheet covering the important subject of Linoleum and Cork Carpet Floors. And while it deals primarily with the laying of our *Gold-Seal* Battleship Linoleum and *Gold-Seal* Cork Carpet, it gives many suggestions which will be of value to you in preparing flooring specifications and contracts, even when other types of floor-covering are specified.

For a free copy of the Linoleum Service Sheet, write our nearest office.



The reverse side of this service sheet contains detailed directions for laying, ready to incorporate in your specifications, as well as some interesting facts about Battleship Linoleum.

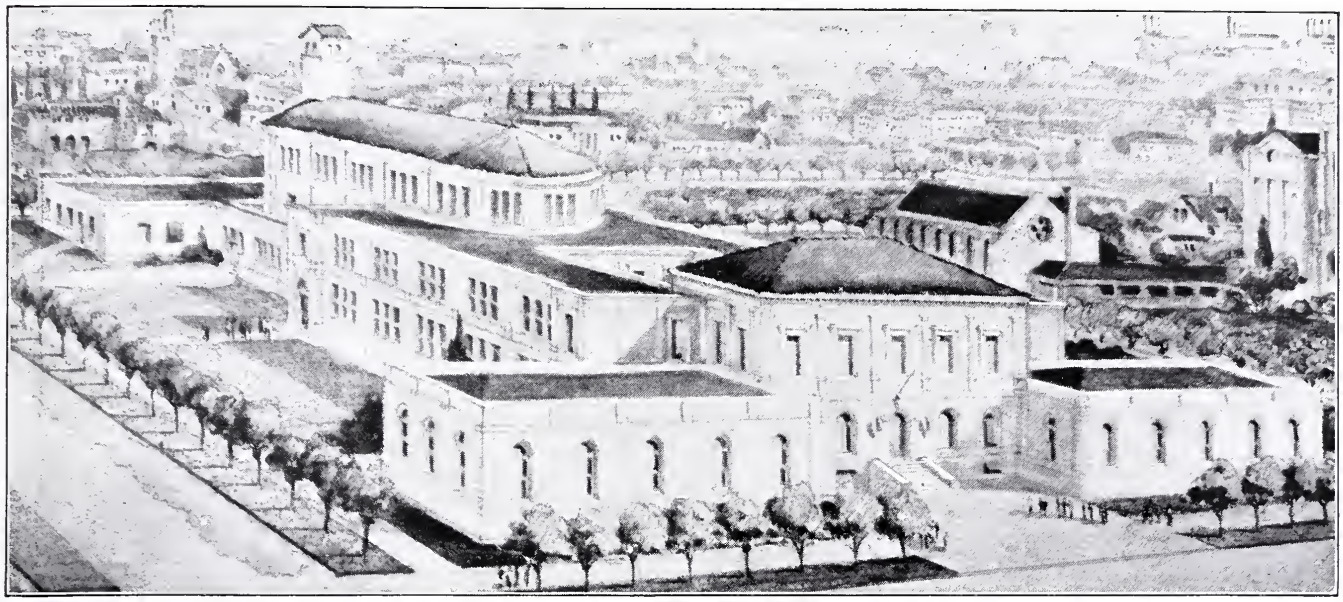
CONGOLEUM COMPANY
INCORPORATED

Philadelphia New York Chicago Boston Kansas City Pittsburgh
San Francisco Minneapolis Dallas Atlanta Montreal

GOLD SEAL
Battleship Linoleum

(THE FAMOUS FARR & BAILEY BRAND)

Made According to U.S. Navy Standard



W. E. and A. A. Fisher, Architects, Denver, Colo. J. R. McDonald, Contractor, Denver, Colo.

$700,000.00 Denver High School

34,500 square feet of Carey Roofing will be applied according to architect's specifications calling for the use of two layers of fifteen pound asphalt saturated felt, three moppings of asphalt, and a top sheet of three-ply roofing.

This is but one of a dozen built-up specifications designed to meet the conditions surrounding various types of buildings. Write for the Carey Architects Specification Book.

THE PHILIP CAREY COMPANY

504-524 Wayne Ave. Lockland, Cincinnati, Ohio, U. S. A.

Carey ROOFINGS

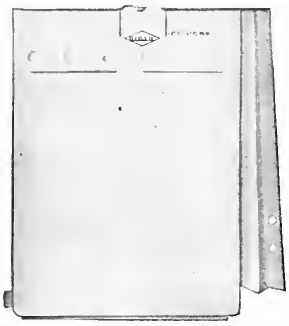
"A Roof For Every Building"

Asbestos and Asphalt Built-Up Roofs, Roll Roofings and Asfaltslate Shingles

Arch. 1-22

SEE OUR CATALOGUE IN SWEET'S

"The Roof that's Always New"



Not only is the Illinois Zinc Shingle everlasting — not only is it artistic — but it's the most convenient and practical form of shingle ever devised. Every Architect should at least investigate this revolutionary roofing.

ZINC SHINGLES

"I WOULD never have believed it. I, and most of the architects I know, realize that zinc is the most perfect material to use on roofs. But we have always been opposed to metal shingles. And yet, if what you say about the Illinois Zinc Shingle is the truth, we'll all be specifying zinc for every shingled roof we build."

Yes, sir — every word of it is true. They make a *butt-shingled* roof in every way as artistic as a roof of slate or wooden shingles.

They've completely overcome the defects of all former metal shingles. They're made — not plated — from pure zinc. It's indestructible — can't crack, warp, rot, rust, work loose or burn — and will long outlast the building it protects.

There are many other features — many reasons why architects have judged it the very best roofing material and the very best form of shingle ever placed on the market. But we very much want to have you judge these numerous improvements and advantages yourself.

Please send, therefore, for samples and descriptive booklet. We will leave the rest to you.

ILLINOIS ZINC COMPANY

Sales Offices:

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820 BRUNNER ST., PERU, ILL.
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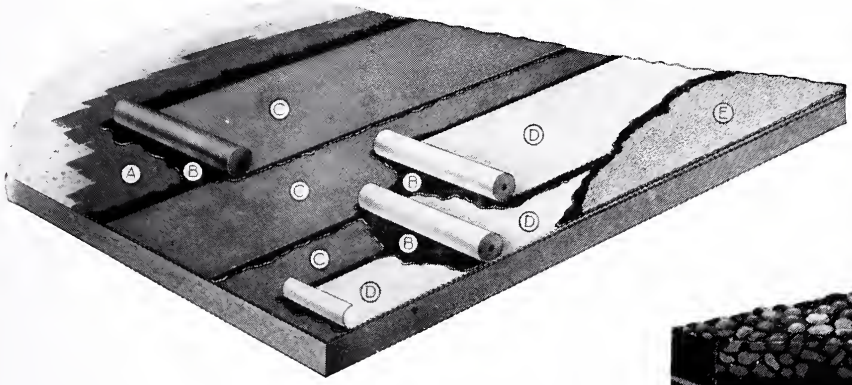
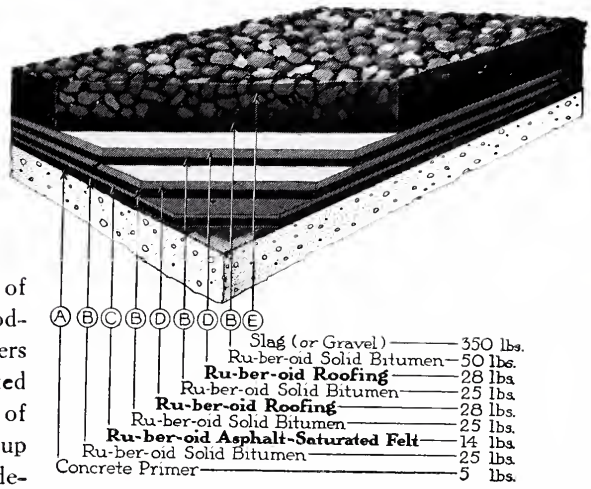
Established 1870

CORRUGATED ZINC SHEETS FOR ROOFING AND SIDING
ILLINOIS ZINC SHINGLES—STRIP OR RIBBON ZINC
SLAB ZINC (SPELTER)—WIDE ZINC SHEETS

Producers of Electrolytic Slab Zinc guaranteed 99.99% pure zinc. The highest grade of Slab Zinc produced in the world





Ruberoid Built-Up Roofs
Durable—Economical—Safe

Durable. Ruberoid Built-up Roofs, from the under layer of felt to the top layer of roofing, are composed of Ruberoid products throughout. Ruberoid Roofing used for the two upper layers is the same high grade roofing, which in a *single layer* has lasted on thousands of buildings, without repairs, for over a quarter of a century. It follows unquestionably that, when used in built-up form, the limit of the durability of this type of roofing is indeterminable.

The under layer of Ruberoid Saturated-felt and the Ruberoid Solid-bitumen, used for cementing the layers together, are similarly manufactured to meet a standard of quality and durability.

Economical. Ruberoid Built-up Roofs are formed of but three layers, yet due to the improved weather resisting properties of the constituent materials will give service as long as a five layer roof of ordinary type. This means a saving of 40% in fabric and cementing material and a corresponding saving in the cost of application. It means a roof which weighs 75 pounds less than a five layer roof per 100 sq. ft. of roof area.

Safe. Ruberoid Built-up Roofs, surfaced with slag or gravel, are accorded the highest rating by the Fire Underwriters Laboratories, Inc. This class "A" rating permits their use within the fire limits of any city.

Samples, descriptive matter and specifications will be gladly furnished upon request.

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Smooth-surfaced Roll-roofing
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Deck-cloth
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FORMERLY THE STANDARD PAINT COMPANY
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RU-BER-OID built up ROOFS

SHINGLES ROLL ROOFINGS BUILT-UP ROOFS BUILDING PAPERS
FELTS PAINTS VARNISHES PLASTICS

A PARADOX WORTH NOTING: ROOFING TIN MARKED "OLD STYLE" DOES NOT MEAN IT IS MADE IN THE OLD STYLE

This company was the originator of the roofing tin brand of "Old Style," and for some thirty-five years our leading brand of roofing tin was known as Taylor's "Old Style" (now called "Target-and-Arrow"). We gave it the name "Old Style" because it was made by us in exactly the same old style followed by the Welsh tin plate makers in the early days of the industry when lasting quality was held in more esteem than large quantity production.

That Taylor's "Old Style" was without exception the peer of roofing tin, has been amply attested by the fact that by 1905 more than three hundred brands of tin plate had been put on the market, by other than the Taylor Company, marked "Old Style," "Old Method," "Old Process," etc.

Prior to 1905

Note that the device of the target and the arrow has always been a feature of our brand, even when it was known as "Old Style"

Unfortunately, our original name "Old Style" was not a name that could be registered with the U. S. Government, and therefore could be used by anyone who desired to do so.

The promiscuous use of the words "Old Style" and similar designations for hundreds of brands of roofing tin has not only been confusing to architects and contractors, but has in many cases misled them into allowing the substitution of tin inferior to Taylor's standard, resulting in dissatisfaction on the part of property owners who thought they were getting Taylor's genuine "Old Style" roofing tin.

Since 1905

Note the words "Old Style" have been replaced by "Target-and-Arrow," emphasizing the device of the target and the arrow shown on the original brand

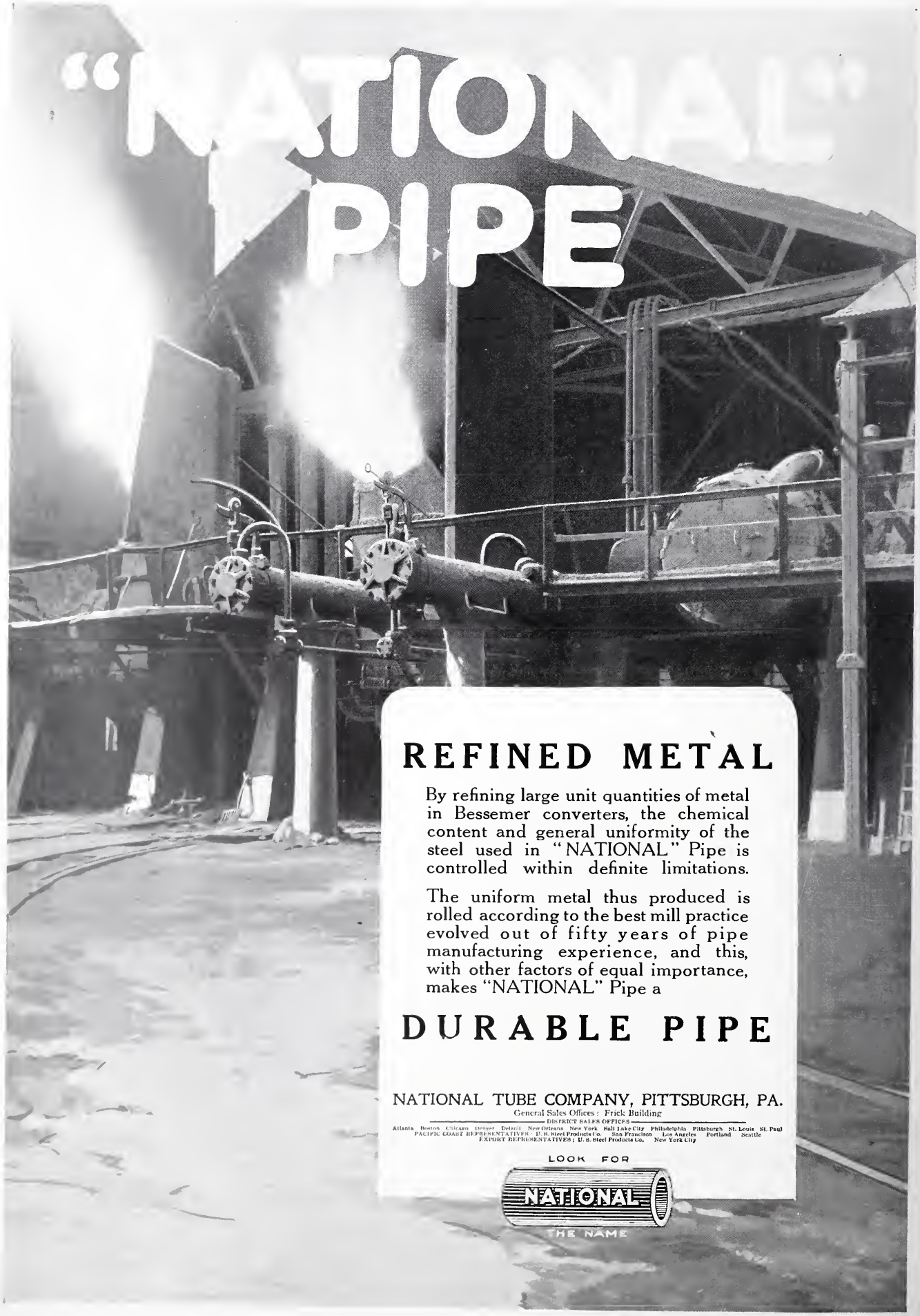
In order to protect our customers and to put them in a position to be *absolutely sure that our old style of hand dipped plate would be supplied when specified, we changed the brand name in 1905 from Taylor's "Old Style" to "Target-and-Arrow."*

THERE ARE MANY GOOD ROOFING PLATES SOLD UNDER THE NAME "OLD STYLE," BUT "OLD STYLE" STAMPED ON ROOFING TIN DOES NOT GUARANTEE THAT IT IS MADE IN THE OLD STYLE MANNER. IF YOU WANT TO BE ABSOLUTELY SURE THAT YOU ARE GETTING ROOFING TIN MADE IN THE OLD STYLE WAY, SPECIFY THE "TARGET-AND-ARROW" BRAND

N. & G. TAYLOR COMPANY

300 CHESTNUT STREET, PHILADELPHIA, PA.

Headquarters for Good Roofing Tin since 1810


"NATIONAL"
PIPE
REFINED METAL
By refining large unit quantities of metal in Bessemer converters, the chemical content and general uniformity of the steel used in "NATIONAL" Pipe is controlled within definite limitations.
The uniform metal thus produced is rolled according to the best mill practice evolved out of fifty years of pipe manufacturing experience, and this, with other factors of equal importance, makes "NATIONAL" Pipe a
DURABLE PIPE
NATIONAL TUBE COMPANY, PITTSBURGH, PA.
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PACIFIC COAST REPRESENTATIVES U. S. Steel Products Co. San Francisco Los Angeles Portland Seattle
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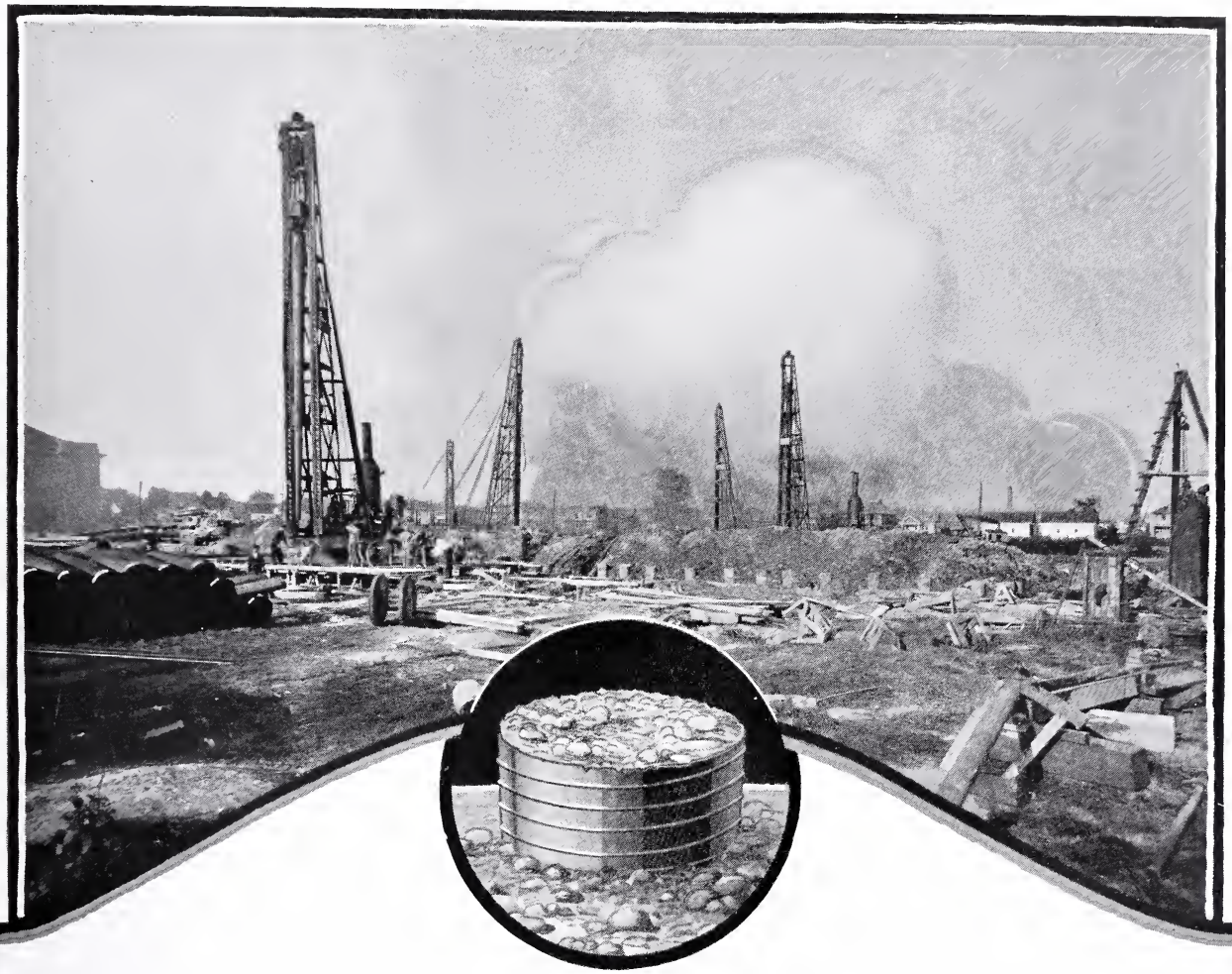
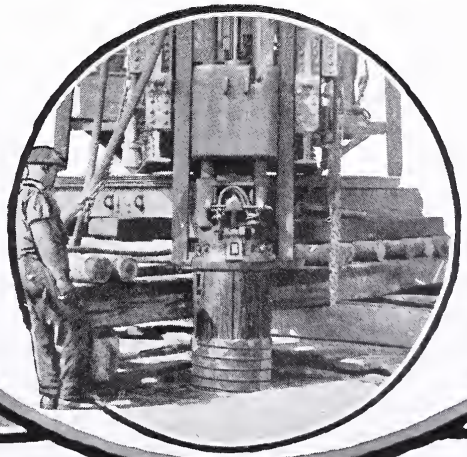
LOOK FOR
NATIONAL
THE NAME





Sheridan Plaza Hotel
Chicago, Ill.

Architect, Walter K. Ahlschlager
Glazed by Sharp, Partridge & Co.

THE window glass used throughout this hotel is a product of the American Window Glass Company.

American Window Glass is distinctly a quality product, made to meet exacting requirements both in double or single strength. Its evenness and freedom from imperfections invariably win it preference.

One of the refinements that gives distinction to such fine buildings as the Sheridan Plaza is the glass used in its windows.

AMERICAN WINDOW GLASS CO.

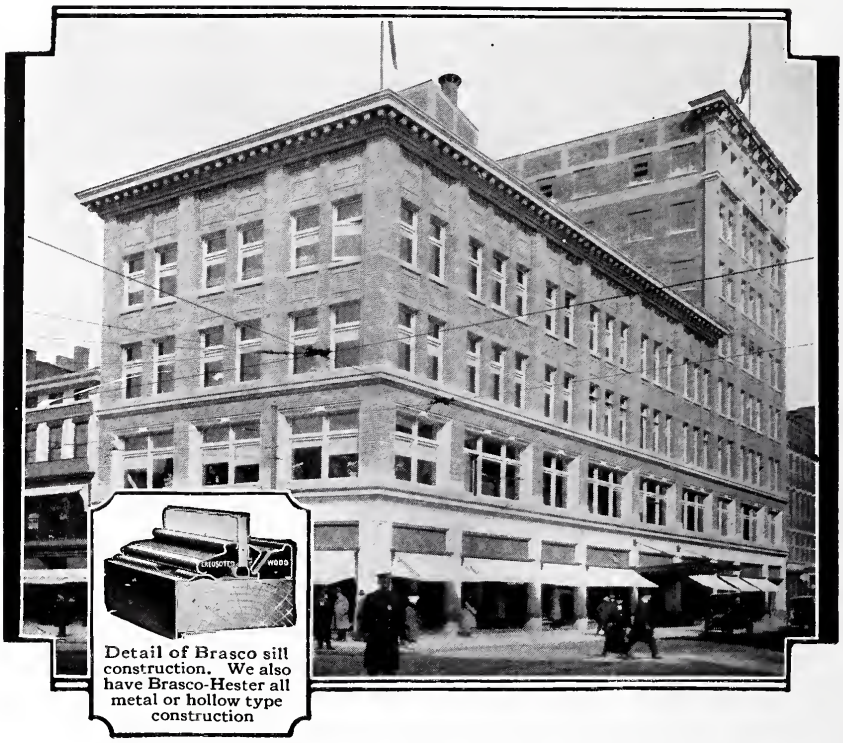
General Offices - Pittsburgh, Pa. - Branches in leading cities as listed in Sweet's

Everlasting

WE really do not know how long a Brasco Copper Store Front will last—but we do know that every Brasco job is good for the life of the building. And that's usually long enough!

Architects are specifying Brasco because they have learned that it lasts—that it is the safest setting known for glass—that it is wonderfully economical—and that it gives a length of service all out of proportion to its low cost. Investigate Brasco today.

Have you our Brasco Portfolio of Full Size Details? If not, send for them today. They fit your files, and are worth having there.



Detail of Brasco sill construction. We also have Brasco-Hester all metal or hollow type construction

Brasco

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Costs Less Than Wood

THE present market prices on Fenestra Steel Windows are lower than they have been at any time since 1912.

You can buy Fenestra today for less than you would have to pay for inflammable wooden sash and frames. In addition, the installation cost is less because Fenestra comes complete all ready to set in the openings—no frames, no planing or fitting, no cords to adjust, etc.

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You can effect a saving for your clients by specifying Fenestra for the small buildings as well as the large industrial plants.

Quick delivery from any one of our 24 warehouses.

Detroit Steel Products Company
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STEEL WINDOWALLS

A Third of a Century

That's our record. We are passing our thirty-third milestone of manufacturing Caldwell Sash Balances. A record we are proud of. Our Sash Balances are still giving service where installed over thirty years ago.

QUALITY PROVEN is assurance

that you can safely specify

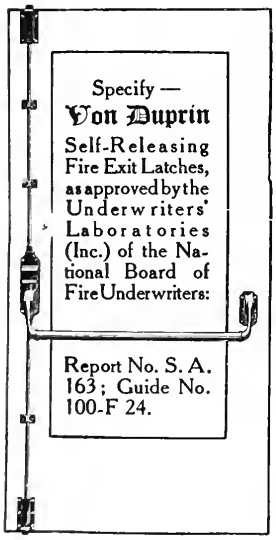
CALDWELL SASH BALANCES

The overhead Balance permits the use of narrow mullions. We are better equipped than ever to render dependable service. Write for Catalogue, "Suggestions For The Present Day Architect."

Caldwell Mfg. Co., File S, Rochester, N. Y.

Von Duprin

Self-Releasing Fire Exit Latches



MAINTENANCE

Von Duprin latches are so well made that the first cost cannot be low.

Yet, over a period of several years the cost is negligible, for the maintenance cost — the important factor — is practically nothing.

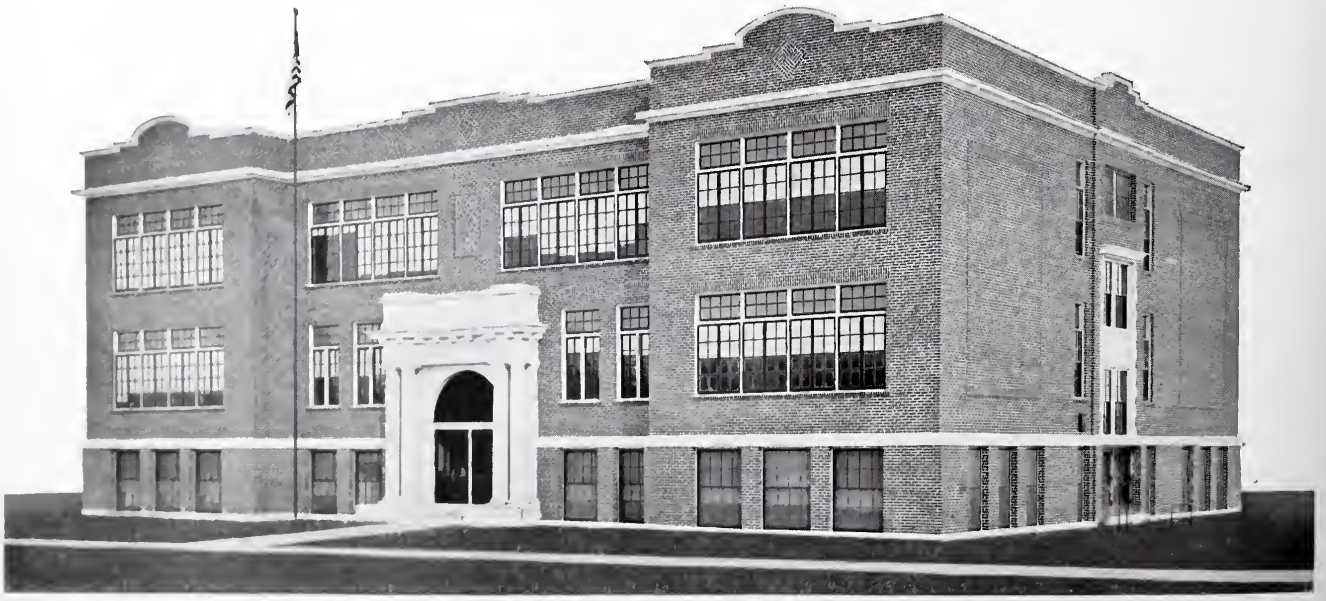
The almost complete elimination of replacement expense is brought about by the balance and weight of the devices, the precision of manufacture, the special wear-resisting features, the simplicity of interior construction, and the new mortise locks, with many important parts cast integral with the case, and with the latch bolts enclosed in close-fitting housings.

The result of such careful design and manufacturing is shown by the record in one city, where more than 600 sets of **Von Duprins** are used on schoolhouse doors — and the total cost for replacement parts has been less than $1.00. Furthermore, many of these **Von Duprins** are of old types which have been in use more than 13 years, and do not have the late improvements.

Von Duprin latches give safety at small expense. Let us send you catalog 12-F, or see "Sweet's," pages 1212-1216.

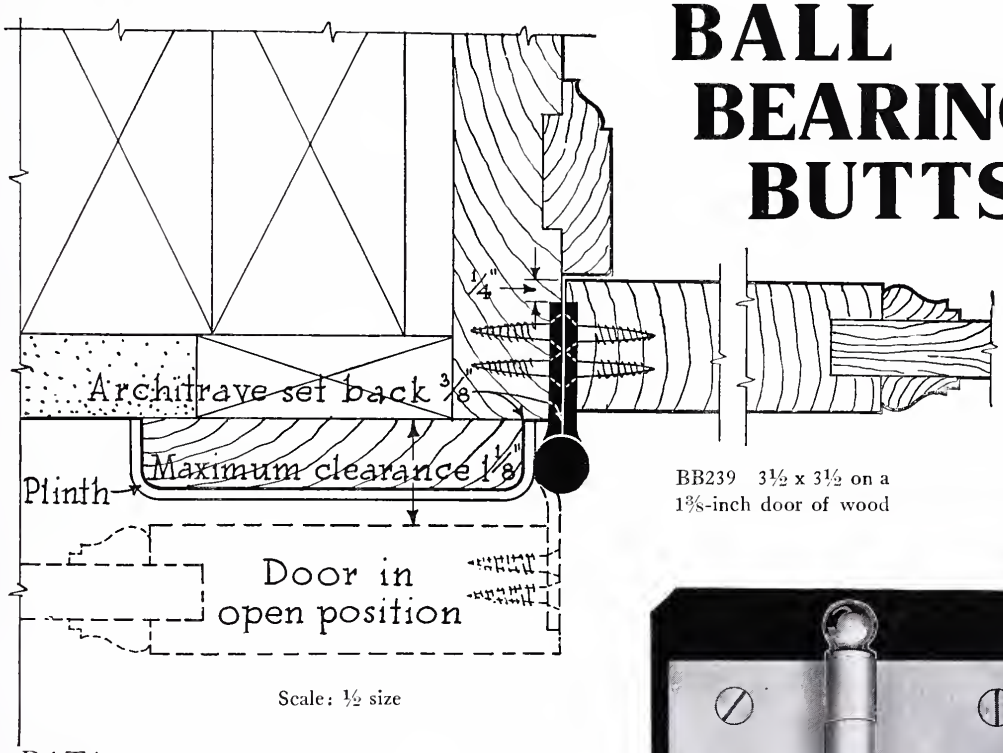
VONNEGUT HARDWARE CO.
Indianapolis, Ind.

Teller Grade School, Denver, Colo.
George H. Williamson, Denver, Architect
Iulius B. Kaer, Denver, Contractor



STANLEY

Specifications on BALL BEARING BUTTS



Scale: ½ size

BB239 3½ x 3½ on a 1⅜-inch door of wood

No. BB239 is made in the following sizes and all finishes:

2½ x 2½	4 x 4
3 x 3	4½ x 4½
3½ x 3½	5 x 5
6 x 6	

DATA

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

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

Class number (BB239) is stamped upon the back of butt, at top of leaf and near joint.

Stanley Sherardized finish (designated by the letter "Z" stamped on leaf near joint) is recommended for exterior use and can be furnished in any plated finish desired.

"Three Butts will prevent the door from warping"

Tear off page and file with your Ball Bearing Butt specifications

STANLEY S.W.

THE STANLEY WORKS
New Britain, Conn.

New York Chicago San Francisco Los Angeles Seattle Atlanta

Manufacturers of Wrought Hardware and Carpenters' Tools

The Highest Stamp of Approval

Hundreds of architects specify Bay State Brick and Cement Coating. There is no finer recommendation for this product. And really, the new home or building of stucco or cement is not complete until Bay State is applied.

For Bay State turns the original dull gray color to a pure, rich white or one of many beautiful tints. Because it dries flat, it does not destroy the distinctiveness of the cement or stucco, but adds to it.

Bay State Coating protects. It sinks into the surface and literally becomes a part of the wall it covers. It waterproofs all buildings of brick, cement or stucco.

Broiling sun or heavy snows have no effect on Bay State whatsoever. Dampness will not seep in. Driving rains cannot beat through it.

We should like to send you samples of Bay State Brick and Cement Coating in white and a large range of colors. Booklet No. 10 shows many homes and buildings on which Bay State has been used. Your request on a postal will bring you both. Write today.

WADSWORTH, HOWLAND & CO., Inc.
Paint and Varnish Makers
Boston, Massachusetts

New York Office
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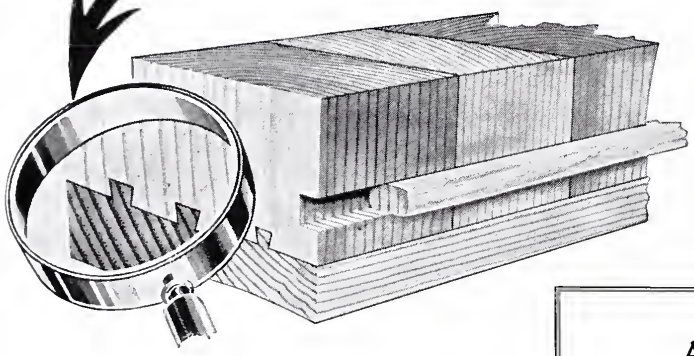
1524 Chestnut Street

BAY STATE
Brick and Cement Coating

Blox-on-end, the only heavy service flooring that stays smooth always

The Southern pine blocks on end are dovetailed to base



Comes to the job in strips generally approximating 8 feet long. Laid as rapidly as ordinary tongued and grooved flooring and in the same manner.

BLOX-ON-END (not loose blocks) makes a bright, clean floor of exceptional durability, which always maintains an even surface and affords resiliency that will practically eliminate fatigue of workmen and reduce wear on trucks. Its smoothness provides the ideal trucking surface, yet it furnishes perfect traction for power trucks, both factors in lessening trucking costs whether by hand or power.

Blox-on-end advantages are being demonstrated in many nationally known industries every day.

If you are interested in only the best, write nearest office for Booklet "B" and Specifications

A Few Users of Blox-on-end

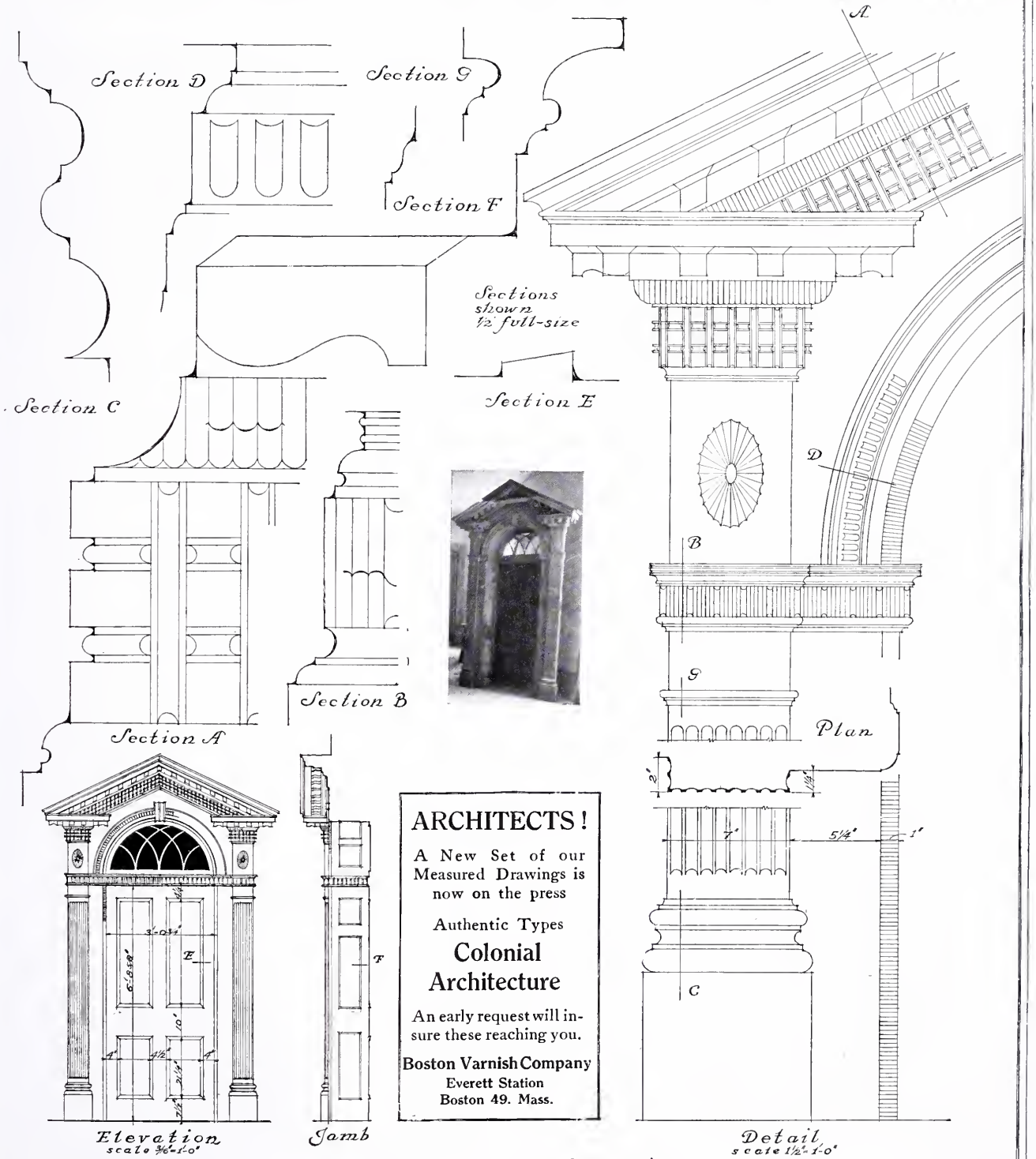
Aluminum Company of America, Massena and Niagara Falls, N. Y.
American Can Company, Portland, Ore., Cincinnati and Newark.
Armour & Co., Chicago, East St. Louis, St. Paul, Omaha and Kansas City.
A., T. & S. F. Ry. freight house at Argentine, Kans.
The Beckwith Co., Dowagiac, Mich.
Buick Motor Co., Flint, Mich., 250,000 sq. ft. in one building.
Bridgeport Screw Co., Bridgeport, Conn.
Cleveland Wrought Products Co., Cleveland, Ohio.
C., M. & St. P. Ry. freight house at Davenport, Ia. Has also been adopted as standard flooring for baggage, mail and express cars.
Continental Motors Co., Muskegon, Mich.
Cushman Sons, Inc., Bakers. Bakeries at New York City and another one at Brooklyn.
Detroit & Toledo Shore Line R.R. locomotive shops, Lang, O.
Eastman Kodak Co., Rochester, N. Y.
Ford Motor Co., Detroit and Columbus, Ohio.
Fordson Tractor Plant, Hamilton, Ohio.
Illinois Central R.R. freight houses, East St. Louis, Jackson, Miss., and Kankakee, Ill.
La Crosse Plow Company, La Crosse, Wis.
Macomber-Whyte Rope Co., Kenosha, Wis.
Michigan Central R.R. freight houses, Dearborn and Detroit.
Montgomery Ward & Co., Chicago, Portland, Ore. and St. Paul.
Nash Motors Co., Kenosha, Wis.
National Lamp Works (General Electric), Cleveland, Buffalo, St. Louis and Bridgeville, Pa.
Otis Elevator Company, installed in elevators shipped to all parts of the country.
Penick & Ford, Ltd., Inc., Cedar Rapids, Ia.
Pierce Arrow Service Co., Long Island City, N. Y.

Carter Bloxonend Flooring Company

Kansas City: 1303 Long Bldg.

Chicago: 332 So. Michigan Ave.
New York: 501 Fifth Ave.

Cleveland: 1900 Euclid Ave.
Boston: 312 Broad Exch.



ENTRANCE DOORWAY

·Now·in·The·Metropolitan·Museum·of·Art·

NEW·YORK·CITY

Measured and drawn by Edgar & Verna Cook Salomonsky

SHEET NO. 5

A List of Users of the P-A-X

Arbuckle Bros., New York, N. Y.
American Linseed Co., New York, N. Y.
American Optical Co., Southbridge, Mass.
American Rolling Mills, Middleton, Ohio
Aunt Jemima Mills Co., St
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Berea College, Berea, Ky.
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Brown & Bigelow, St. Paul,
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Calumet & Arizon
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Fuller-Morrisson Co., Chicago, Ill.
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Singer Sewing Machine Co., Elizab
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Sydney Process Co
St
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The P-A-X Exceeds Specifications

Time and again, Architects, who have specified the P-A-X for Interior Communication Service, have found that it exceeded specifications.

Clients have often failed to foresee their real needs. And after the new quarters have been occupied they realize that many additional interior telephones are required at once. The design of the P-A-X is such that it can be expanded easily, quickly and economically.

Or if an unexpected need should arise for a Code Call or Watchman System or Emergency Alarm—the P-A-X equipment meets such demands without trouble and at slight expense.

An Architect who specifies the P-A-X covers *all* the inter-communication needs of his client with *one* economical, efficient, time-tested equipment.

The services of our field engineers are at your disposal. Write or telephone our nearest office for any special information you require.

The Automatic Electric Services of the P-A X combine inter-communication, code call system, conference wire, emergency alarms, watchman's calls and other related services.

The P-A-X augments and completes but does not supplant nor connect with local and long distance telephone service.

AUTOMATIC ELECTRIC COMPANY
HOME OFFICE AND FACTORY: CHICAGO, ILLINOIS

Boston Office, 445 Tremont Bldg.; New York Office, 21 East 40th St.; Philadelphia Office, The Bourse Bldg.; Rochester Office, 612 Mercantile Bldg.; Washington Office, 405 Munsey Bldg.; Pittsburgh Office, 608 Fulton Bldg.; Detroit Office, 525 Ford Bldg.; Cleveland Office, 415 Cuyahoga Bldg.; Columbus Office, 516 Ferris Bldg.; Kansas City Office, 1001 New York Life Bldg.; San Francisco Office, 320 Market St.

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ompany, Indianapolis, Ind.
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Mercy Hospital, Pittsburgh, Pa.
Michigan Farm Colony, Wahjamega, Mich.
Mellon, A. W., Residence, Pittsburgh, Pa.

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, Johnson & Co., Endicott, N. Y.
e Forge & Steel Co., Erie, Pa.

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United Fruit Co., Boston, Mass.
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Wrigley Co., Wm. Jr., Chicago, Ill.
Wanamaker, John, Philadelphia, Pa.
Victoria Railways, Melbourne, Australia
Western Union Tel. Co., Indianapolis, Ind.
War Department of France, Paris, France
Willys-Overland Co., New York, N. Y.
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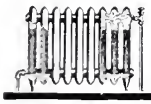
Adsco Graduated Radiator Valve

Note steam at top of radiator, air below



Perfect Heating for Banks and Public Buildings

ADSCO Heating's flexibility finds great favor for buildings that are usually difficult or expensive to heat. Its perfect control of the amount of radiation in service at any moment means quick response to any emergency of weather variation. This perfect control of steam used—no wasteful overheating—means a saving of 20 to 30% of all fuel cost. Adsco Heating is simple, flexible, inexpensive to install.

Ask about Adsco Heating for individual buildings, Bulletin 158-AF; for Adsco Community Heating of a group of buildings from Central Station Steam Plant, Bulletin 20-AF.

AMERICAN DISTRICT STEAM COMPANY

GENERAL OFFICES AND WORKS
NORTH TONAWANDA, N.Y.

AGENCIES

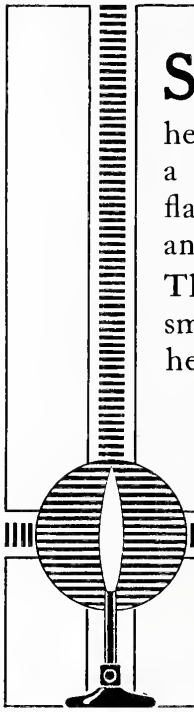
Chicago ..... First National Bank Bldg.
New York ..... 1777 Woolworth Bldg.
Seattle ..... Hoge Bldg.
Boston, Mass. ..... 2A Park St.
Pittsburgh, Pa. ..... 1404 Arrott Bldg.

16219

Adsco Damper Regulator

ADSCO HEATING

The Bunsen Burner Idea Used In Heating Systems



SUPER-SMOKELESS BOILERS admit fresh air into the very heart of the fire. This produces a blue-white, intensely hot flame that consumes the smoke and all combustible gases.

They burn soft coal without smoke and have remarkable heating capacity.

List of installations and descriptive catalog on request

Utica Heater Company

UTICA, N.Y.

218-220 West Kinzie St., Chicago, Ill.

Branches In Principal Cities

Flushes Instantly with Big Saving in Water

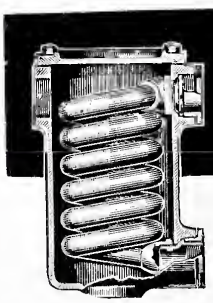
Note in the diagram above the direct line of flow—with no crevices, ledges or passages to foul. Protected always by positive water seal. The Watrous Closet saves two to three gallons of water on each flushing. Write for our prices and detailed description.

WATROUS SANITARY PLUMBING FIXTURES PATENTED DUOJET

The Imperial Brass Mfg. Co.

1201 W. Harrison Street Chicago, Ill.

Send for catalog also describing Watrous Flushing Valves, Urinals, Self-Closing Cocks, Liquid Soap Fixtures, Drinking Fountains, etc.



Sectional View

HOT WATER AT LOWEST POSSIBLE COST

Specify the EXCELSO Water Heater

MEET the demand for **constant supply of hot water**—

without cost for extra fuel,
without the inefficient fire-pot coil,
without trying some unknown device.

The Excelso connects on the **outside** of any steam or vapor-heating boiler.

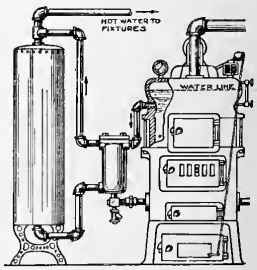
Endorsed and SOLD by the following boiler manufacturers:

American Radiator Co.
Richardson & Boynton Co.
Richmond Radiator Corp.
Standard Heater Co.
Utica Heater Co.
Burnham Boiler Corp.
Pierce, Butler & Pierce Mfg. Co.
United States Radiator Corp.
International Heater Co.
Boynton Furnace Co.
The Wm. H. Page Boiler Co.
Gurney Heater Mfg. Co.
Thatcher Furnace Co.
Abendroth Bros.

Also by plumbing supply jobbers everywhere

SEE OUR CATALOG IN SWEET'S

Or write for Folder No. 177

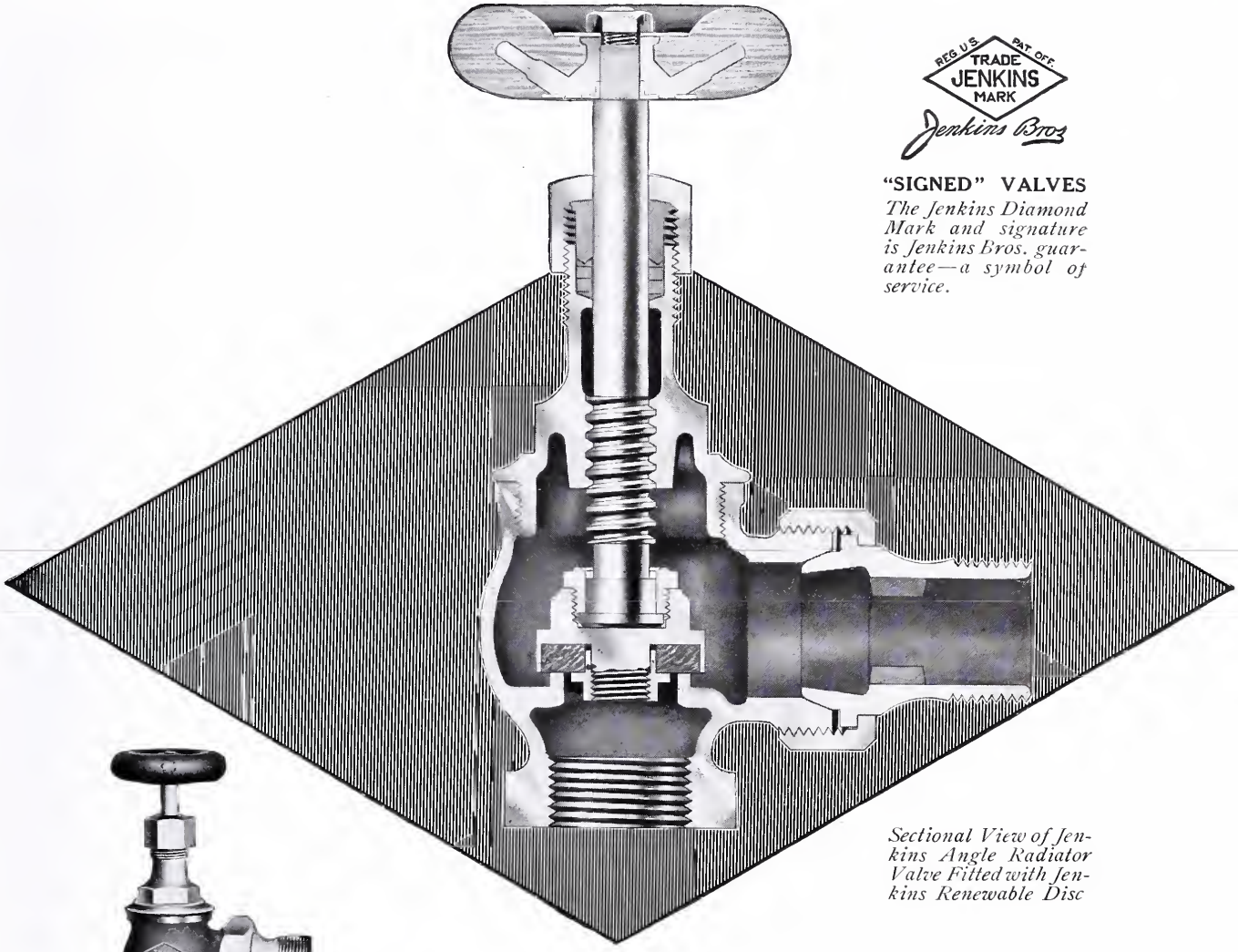


Typical Installation

EXCELSO

EXCELSO SPECIALTY WORKS

119 Clinton Street Buffalo, N.Y.



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

Jenkins Bros

"SIGNED" VALVES

The Jenkins Diamond Mark and signature is Jenkins Bros. guarantee—a symbol of service.

Sectional View of Jenkins Angle Radiator Valve Fitted with Jenkins Renewable Disc

Fig. 168

Jenkins for heating satisfaction and comfort

A heating system, no matter how good, can be no better than its valves. Trouble is frequently traceable to cheap, light weight valves. Assure valve service by specifying genuine Jenkins "Diamond Marked" Valves — valves that have been long and widely known as a standard of dependability.

Jenkins Radiator Valves are cast of the best steam metal and in proportion that secures a heavier, stronger valve. You can depend on a Jenkins to "stand up" even when subjected to the most severe service.

Jenkins Valves do not leak—asbestos ring packing in stuffing box is compressed by brass follower or gland. The valves open easily and close tightly. Made in various types and with various finishes. Two of the most commonly used types are illustrated. Fig. 168, Brass Radiator Angle Valve with Union ; Fig. 167, Brass Radiator Globe Valve with Union.

Fig. 167

JENKINS BROS.

New York Boston Philadelphia Chicago
Montreal London Havana

FACTORIES: Bridgeport, Conn.; Elizabeth, N. J.; Montreal, Canada

Jenkins Valves

SINCE 1864

Remodeling Old Houses

THE present home shortage is making the remodeling of old buildings as attractive to the owner as it has always been to the architect.

A difficult element—when expense must be considered—is the heating plant. Even if in good condition, and efficient within its rating, it may not be adequate for contemplated additions, or certain rooms may defy all efforts to heat them by ordinary means.

When you come to *heating*, think of

"Steam heat without coal"

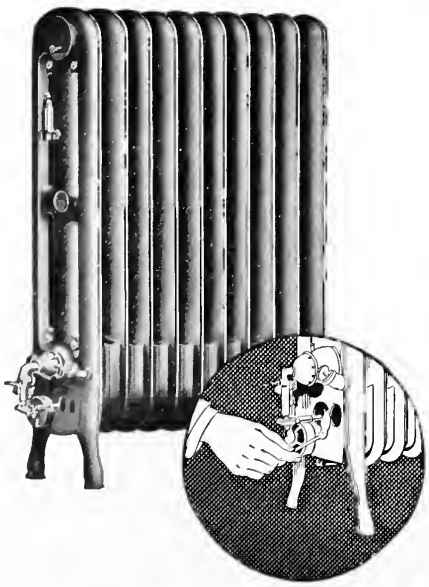
Gasteam

A few Gasteam radiators will amplify existing heating facilities, and make cold rooms a thing of the past.

Gasteam radiators are in wide use, supplying heat for all classes of buildings. They can be quickly installed, by merely running a gas pipe.

They are solidly built of cast iron, and will last indefinitely. An automatic regulator takes care of fluctuations in temperature.

Gasteam heating, whether used as the sole source of heat, or in conjunction with coal-burning equipment, is clean, healthful and safe. And because no attention is required, and fuel is consumed only when really needed, it is *economical.*



If you haven't the Gasteam Handbook, send for a copy today.

JAMES B. CLOW & SONS

General Offices: 534-546 S. Franklin Street, Chicago

Sales offices in the principal cities

CLOW

Why Apartment Builders Are Specifying the Kernerator

MANY owners and builders of fine apartments are including the Kernerator in their plans for this year because they have come to realize the vital importance of this modern system of household waste disposal. They have learned how it affords added comfort and convenience to tenants, how it promotes sanitation by eliminating fouled dumb waiters and rear porch garbage and refuse cans.

But the chief advantage that recommends the Kernerator to apartment builders is its economy. Once a Kernerator is built into an apartment, the expense for the removal of garbage and waste is ended, except for the time required to clean out ashes and tin cans every five or six weeks.

There are no garbage cans and waste receptacles to be repaired or replaced each year. Practically one-third of a janitor's time is saved because he does not have the disagreeable duty of collecting this refuse at frequent intervals. There is no operating cost since no coal, wood, oil or gas is required for fuel. In fact, there is no cost except the first cost and this is surprisingly reasonable.

For additional information see page 1906
Sweet's 1921 Catalog

THE Kernerator consists of a brick incinerator, built into the base of the chimney in the basement when the house or apartment is erected, and hopper doors located in the flue on the floors above. All household waste — rags, sweepings, wilted flowers, broken crockery, tin cans, garbage — is thrown into these doors and falls down into the incinerator where at intervals it is lighted and burns itself up. Costs nothing to operate since no commercial fuel is required. Non-combustibles are dried and sterilized and later dropped into the ashpit.

KERNER INCINERATOR CO.
1015 Chestnut Street - Milwaukee, Wis.

KERNERATOR
Built-in-the-Chimney

Reg. U. S. Patent Off.

Hotel Pennsylvania, New York, the largest hotel in the world, is fitted with a Webster System of Steam Heating

in the Hotel—

as in every other type of building, Webster Systems of Steam Heating are preeminent

The first of a series describing the application of Webster Heating Equipment to every type of building and the Webster Cooperation with architects and engineers that assures permanent heating system satisfaction

A few representative hotels fitted with Webster Heating Equipment

All Statler Hotels
Pennsylvania, N. Y.
Waldorf-Astoria, N. Y.
Plaza, N. Y.
Bellevue-Stratford, Phila.
Copley-Plaza, Boston
Congress, Chicago
St. Francis, San Francisco
Fontenelle, Omaha
Tutwiler, Birmingham
Traymore, Atlantic City
Grove Park Inn, Asheville
Leamington, Minneapolis
New Willard, Washington
Sinton, Cincinnati
Ansonia, N. Y.
Belmont, N. Y.
Ten Eyck, Albany
Ambassador, Atlantic City
Marlborough-Blenheim, Atlantic City
Gibson, Cincinnati
Dupont, Wilmington
Robert Treat, Newark
Kimball, Springfield, Mass.
Deshler, Columbus
Taft, New Haven
Durant, Flint
Penn-Harris, Harrisburg
Seneca, Rochester

An efficient and economical heating system pays high dividends to the hotel owner in the satisfaction that it assures guests and the fuel saving it provides.

Whether it be a country town hotel of less than a hundred rooms or a huge city hotel of a thousand rooms or more, the wide adaptability of Webster Systems of Steam Heating, proven in over 17,000 installations, enables architects and engineers to select Webster equipment that will be exactly suitable for any given requirements.

The experience of the Webster organization, based on 33 years of consistently maintained leadership in the development of steam heating systems, is at the disposal of architects and engineers in planning and installing heating equipment for any type or size of building.

May we describe the details of Webster equipment and Webster Service to you?

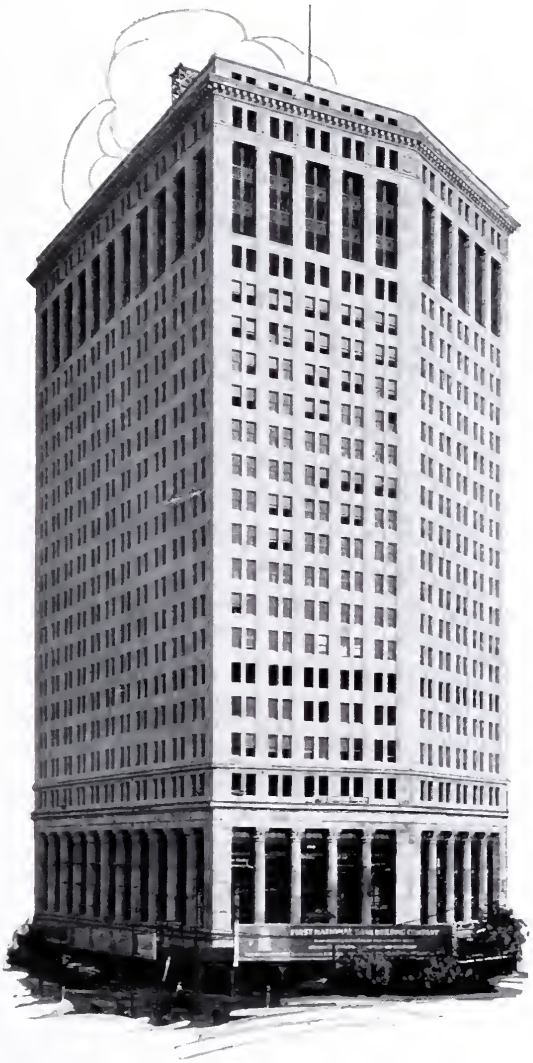
Write for Bulletins

SAMPLES DISPLAYED WITH ARCHITECTS' SAMPLES CORP. NEW YORK CITY

WARREN WEBSTER & COMPANY
Main Office and Works: Camden, New Jersey
Branch Offices in All Principal Cities

Webster

MODULATION SYSTEM OF STEAM HEATING
VACUUM SYSTEM OF STEAM HEATING
STEAM AND OIL SEPARATORS
FEED WATER HEATERS
STEAM SPECIALTIES



First National Bank Building of Detroit is but one of many beautiful structures that have been laid up in "the cement that nature mixed."
Architect: Albert Kahn, Detroit
Contractors: The Foundation Company

The Cement that nature mixed

THOUSANDS of years ago nature mixed a batch of cement that was destined to revolutionize the making of mortar for present-day brick and tile work. In this particular deposit of stone near Mankato, Minnesota, lime was mixed chemically in the correct proportion to produce, when burned and ground, a smooth working, slower setting mortar of greatest economy and unsurpassed quality. The necessity of adding lime at the mortar box has thus been eliminated.

This nature mixed cement has been named Carney's Cement. It is unlike any cement used in building construction today since its formula calls for but three parts of sand to one of cement to make a mortar that becomes harder than the brick it joins, consequently making a wall of solid masonry. The addition of too much sand interferes with its working properties, thus placing an automatic check on carelessness at the mortar box.

Carney's Cement costs less, saves time and labor and lays more brick per barrel. It can stand over night and be used the next morning by merely adding water, thus eliminating waste. The use of Carney's Cement in America's finest buildings testifies that architects have found it to be "the bond that guarantees the wall."

Send for Complete Information

Write today and let us send you our illustrated book giving complete details on the cement nature mixed.

Carney's Cement Company

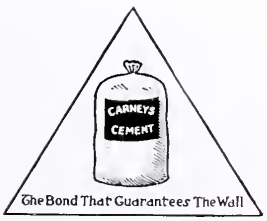
Cement Makers Since 1883

Mankato, Minn.

District Sales Offices:

The Carney's Cement Sales Co., Leader-News Bldg., Cleveland; Chamber of Commerce Bldg., Chicago; Omaha National Bank Bldg., Omaha; Syndicate Trust Bldg., St. Louis; *Jas. Quinn, Jr.,* Book Bldg., Detroit; *Carney's Cement Co.,* Builders' Exchange, Minneapolis

Specifications: 1 part Carney's Cement, 3 parts sand, no lime



CARNEY'S CEMENT
For Brick and Tile Mortar

Making Schoolhouse Steps SAFE

Architectural attractiveness was a factor—it was essential that every step be made slip-proof and safe—the steps had to be made durable—maintenance costs had to be eliminated.

The architects (Frost & Chamberlain) of the Worcester Girls' Trade School, Worcester, Mass., a beautiful $350,000 building, solved this stairway problem with ALUNDUM SAFETY TILE. The stairtreads are cast iron with steel risers. The cast iron tread is depressed to receive the tile which is set in cement mortar.

Thus every step in the building, two sets of stairways from shower baths to the top floor, are made slip-proof, trip-proof and wear-proof and the architects were able to get the desired harmonious effects.

ALUNDUM SAFETY TILE is manufactured by

NORTON COMPANY

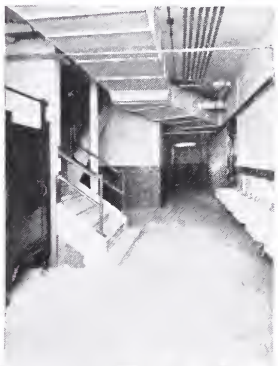
Worcester - - Massachusetts

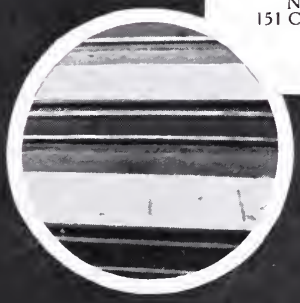
New York
151 Chambers St.

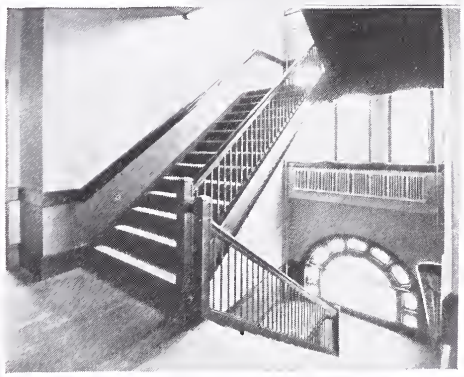
Chicago
11 No. Jefferson St.

Detroit
233 W. Congress St.

T-31







Manufacturers' Catalogs and Business Announcements

CATALOG REVIEW

The Associated Tile Manufacturers, Beaver Falls, Pa. "Basic Specifications for Tilework" (7½ x 10½ ins.). 38 pp., Publication No. K–300. "Documents Relating to Specifications for Tilework; Work Sheets for Specification Writers" (7½ x 10½ ins.). 16 pp.

The first named publication is the result of cooperation on the part of architects, engineers, representatives of different branches of the government, various technical experts, tile manufacturers, contractors and tile setters, and its preparation has been extended over a long period of time. The matter of specifications for tilework has been given careful and exhaustive treatment at the hands of men qualified by long experience, and its publication will undoubtedly promote cooperation and more complete understanding between those engaged in different branches of the tile industry.

One section, entitled "Basic Specifications," deals with general specifications covering tilework and is written upon the hypothesis that the tile contractor is to furnish or sublet all materials and labor necessary and be responsible for the completed work. Another section, "Notes to the Architect," deals with the matter from the viewpoint of the architect, and in "Notes to the Tile Contractor" certain observations are made which apply to the performance of his duties, one more section, "Notes to the General Contractor," completing the treatment of the subject. Other pages deal with such items as schedules, accessories and other details, and the entire publication is well indexed which adds to its value.

"Documents Relating to Specifications for Tilework" is a compilation of work sheets for specification writers, and additional sheets will be supplied free of charge to those interested. The introduction to the entire work says that it has been prepared under the direction of D. Knickerbacker Boyd of Philadelphia, and that those who use the "Basic Specifications" or the "Documents" may depend upon the results of his experience proving of practical help.

Sprague Electric Works, Main Office, 527 West 34th street, New York. "Panel Boards and Cabinets" (8 x 11 ins.). 65 pp.

The correct equipment of modern buildings of numerous types demands the use of various details of electrical equipment, the supplying of which is a highly specialized business. This bulletin (No. 47901) is devoted to describing and list-pricing the numerous forms of cabinets and panel boards which experience has proved to be those which best meet general requirements, information concerning other styles adapted to special needs being supplied on request. The panel boards here listed are arranged for National Electrical Code enclosed fuses or Edison plug fuses, and both types are furnished either with or without knife blade, rotary snap or push-button switches in branches as may be desired. They are designed for 125-volt, 2-wire or for 125-volt, 3-wire service. All the appliances listed in this catalog meet the requirements of the National Board of Fire Underwriters.

A section of this catalog is devoted to a description of the "Sprague Metering Panel," particularly adapted for use in office buildings, apartment houses and other structures where electrical current is supplied to different rooms and for different tenants. Formerly a meter was necessary for each room, but by using the "Sprague Metering Panel" any room or combination of rooms belonging to one tenant can be metered through one meter by merely changing the location of the meter connector on the face of the board. Other recent bulletins are those on "Sprague Mantel Circuits" (No. 47941) and "Safety Panel Boards and Cabinets" (No. 47942).

Architectural Service Corporation, Philadelphia. "Architects' Service Sheet No. 38," complete in four parts (16½ x 21½ ins.).

The particular qualities of sheet zinc which render it of especial value for roofing are its lightness and economy as compared with some other materials which are sometimes used for this purpose, while its use for more than a century has amply demonstrated its durability. This "Service Sheet," issued by the American Zinc Institute, Inc., brings to the office of the architect or roofing contractor invaluable data, containing as it does standard specifications which apply to many widely different roofing conditions as well as drawings which illustrate the use of sheet zinc on roofs of various constructions. The directions and suggestions for estimating are features which render the Service Sheet of additional value, and it also includes a comparison of gauges and thickness in inches and a table of approximate weights.

ANNOUNCEMENTS

Boyd, Abel & Gugert announce the removal of their offices to the Otis Bldg., 112 South 16th street, Philadelphia.

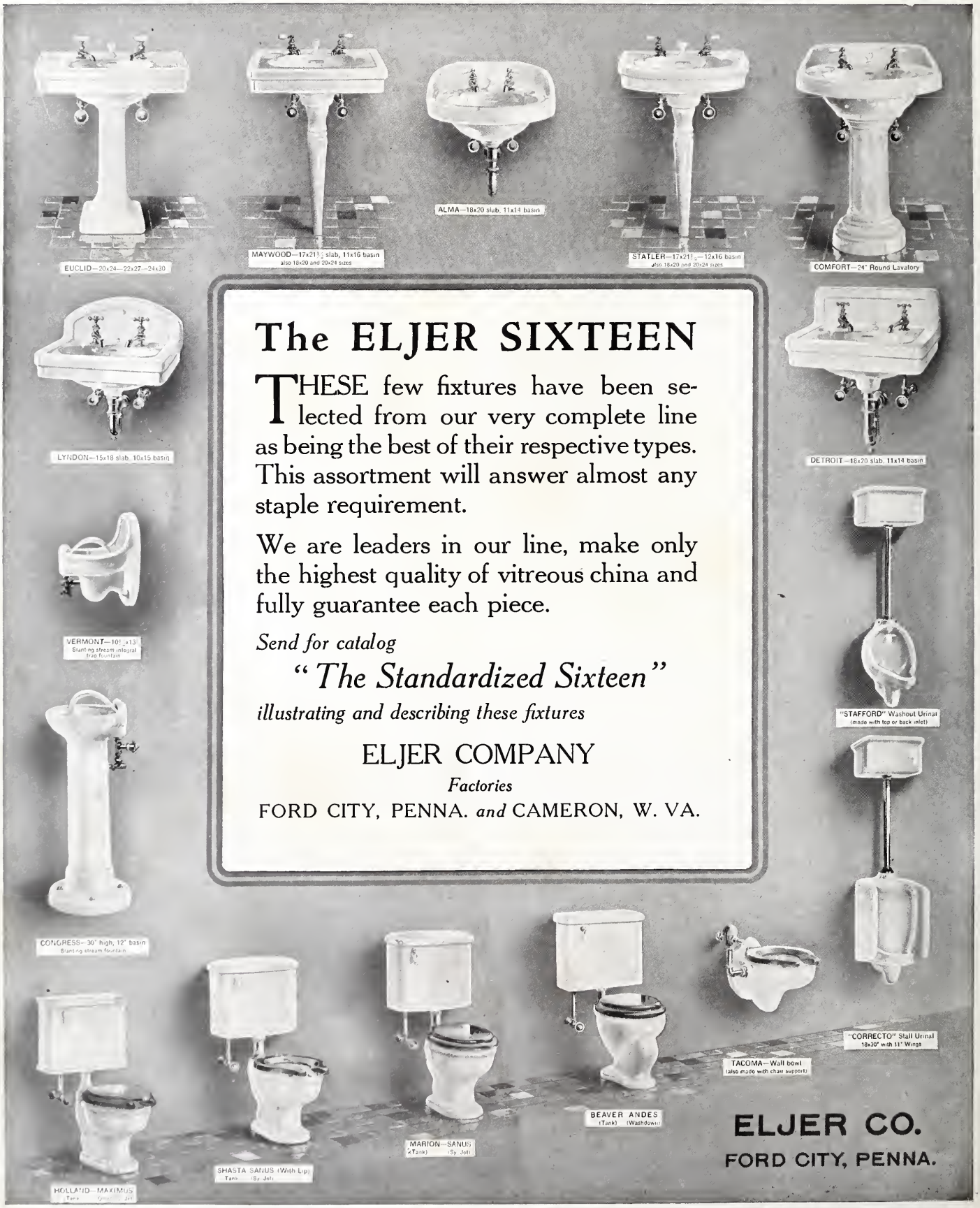
W. Whitehill, architect, announces the removal of his office to the Buckley-Newhall Bldg., Forty-first street and Sixth avenue, New York.

G. Herbert French announces that he has severed his association with W. Duncan Lee, architect, and has opened an office at 513–515 Times-Dispatch Bldg., Richmond, Va., for the practice of architecture. Manufacturers' catalogs and samples requested.

John T. Comes, architect, Renshaw Bldg., Pittsburgh, Pa., wishes to announce that he has taken into partnership two of his former associates, Will R. Perry and Leo A. McMullen. The firm will henceforth be known by the name of Comes, Perry & McMullen.

Ernest F. Coe, landscape architect, announces the removal of his office to 951 Forest road, New Haven, Conn.

Index to Advertising Announcements



The ELJER SIXTEEN

THESE few fixtures have been selected from our very complete line as being the best of their respective types. This assortment will answer almost any staple requirement.

We are leaders in our line, make only the highest quality of vitreous china and fully guarantee each piece.

Send for catalog

"The Standardized Sixteen"

illustrating and describing these fixtures

ELJER COMPANY

Factories

FORD CITY, PENNA. *and* CAMERON, W. VA.

Make sure. Look for the Cypress Trade Mark on every board.

Refuse "anonymous" Cypress. Insist on the genuine.

CYPRESS tree standing in churchyard at Santa Maria, Del Tule, Mexico. At least 5,000 years old, still vigorous and healthy—*beautiful in its old age.*

The Oldest Tree in the World!

This 5,000-year-old CYPRESS tree offers one more convincing proof —if proof is needed—of the longevity and healthy *everlastingness* of CYPRESS, an interesting link between the dim past and the present.

"TIDE WATER"

CYPRESS RESISTS ALL ROT INFLUENCE

CYPRESS

CYPRESS DEFIES DECAY!

"THE WOOD ETERNAL"

has the same characteristics as to "longevity" and "everlastingness" as its namesake above, where it is employed for all "outside" uses such as porch construction—porch floors, porch columns, steps and rails — siding, etc. CYPRESS may be depended upon to render long life and satisfactory, and always dependable, service. *Cypress defies decay.*

CYPRESS ALSO FOR INTERIOR TRIM? Indeed yes. Send for Vol. 31 of the *Cypress Pocket Library* and get the interesting facts. *Free* with our compliments.

The entire resources of our *"Architects' Department"* are at your service with reliable counsel. Write, please.

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