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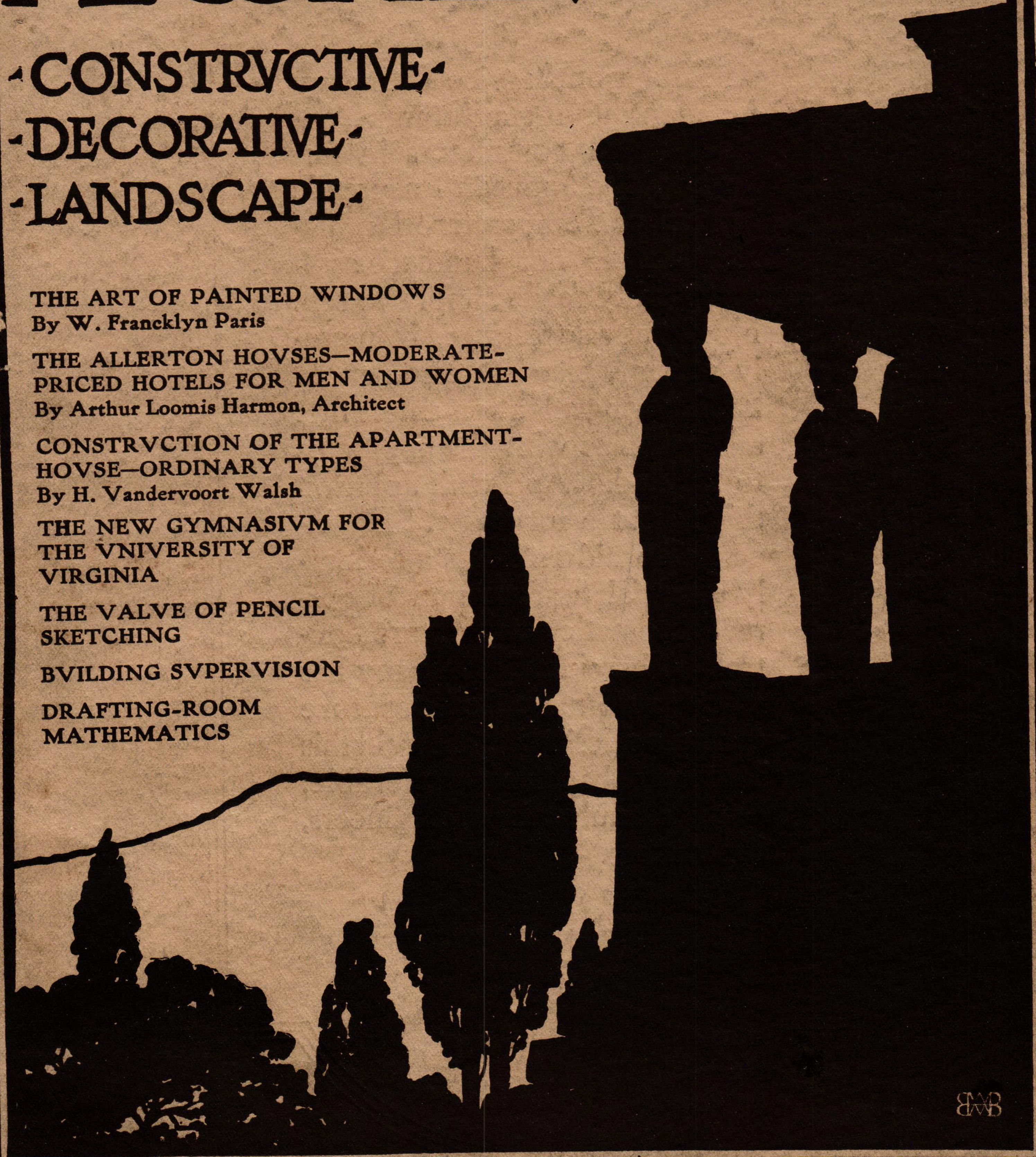

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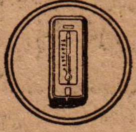

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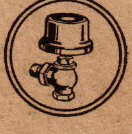

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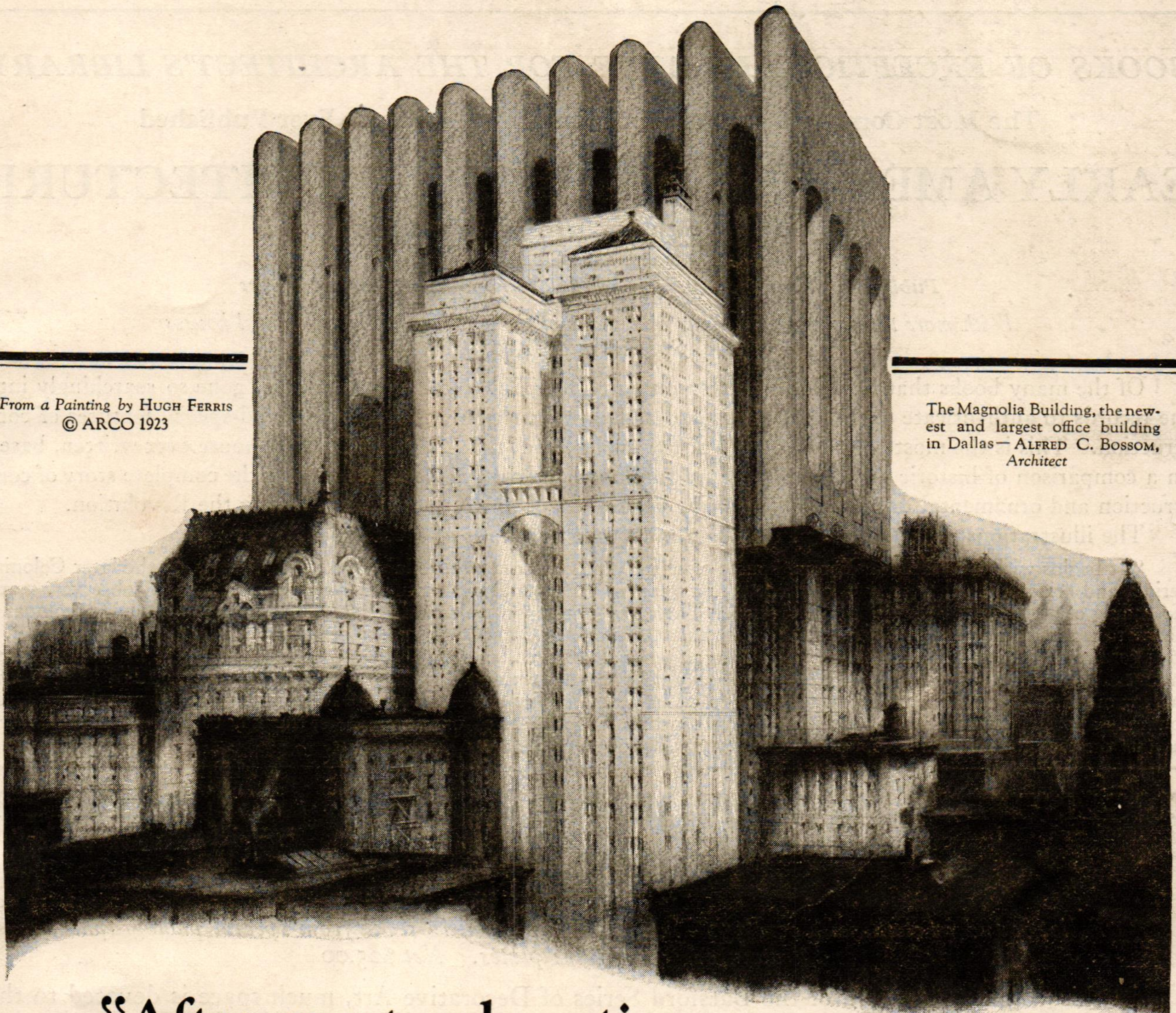

The Magnolia Building, the newest and largest office building in Dallas—ALFRED C. BOSSOM, *Architect*

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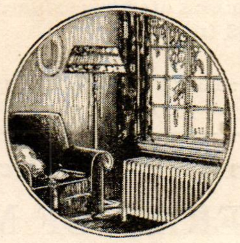

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But, alas! altho the wind whispers through their leaves, the upreaching, outspreading old patriarchs keep their own counsel, and we, mostly by hearsay, know of the part they have played!

Of such are the ancient Elms that hover about the Old Stone State House at Kingston, New York.
Erected by a sturdy Dutch settler, in 1676, it was afterwards used as the Senate House until 1777, when the British burned Kingston and the capital was removed to Albany.
It was in this memorable old building that the Constitution of the State was adopted.

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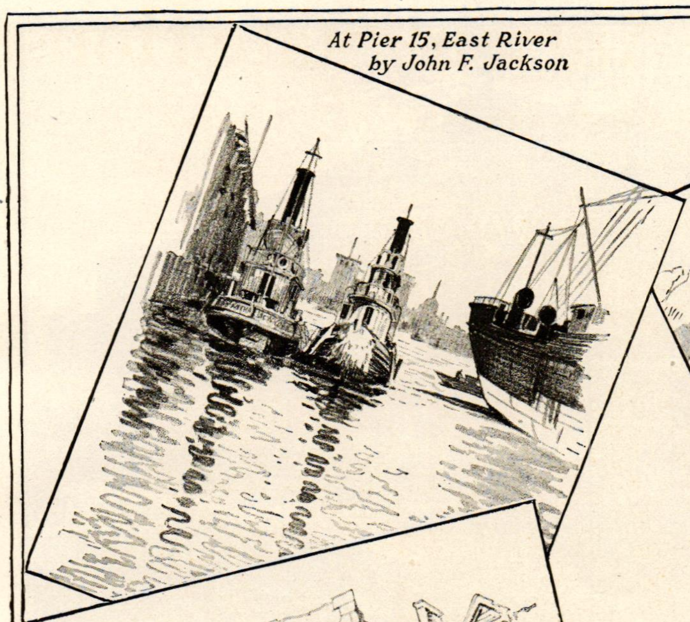

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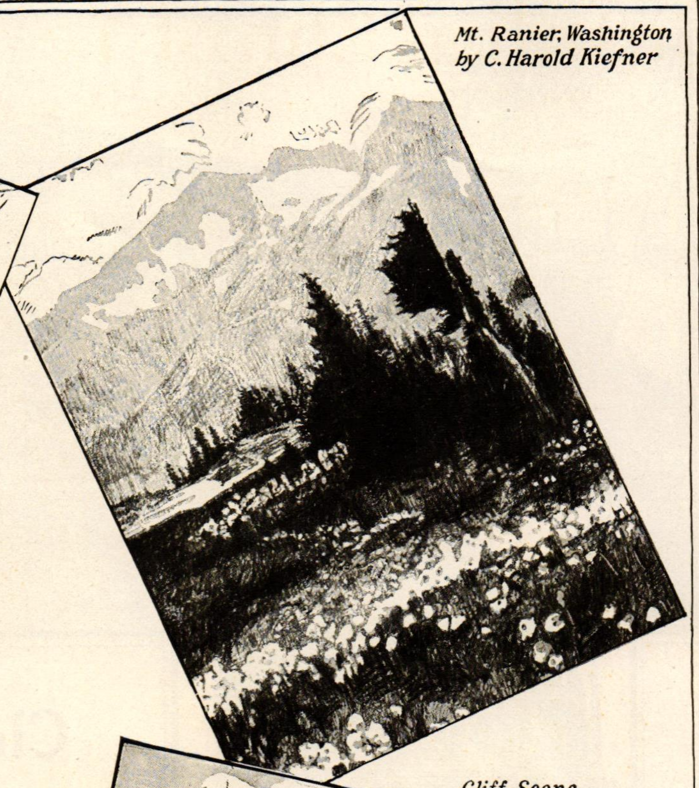

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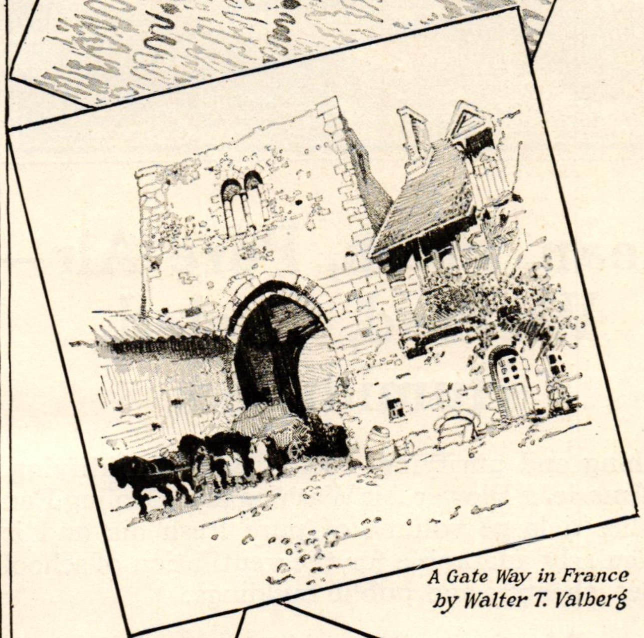

A Gate Way in France
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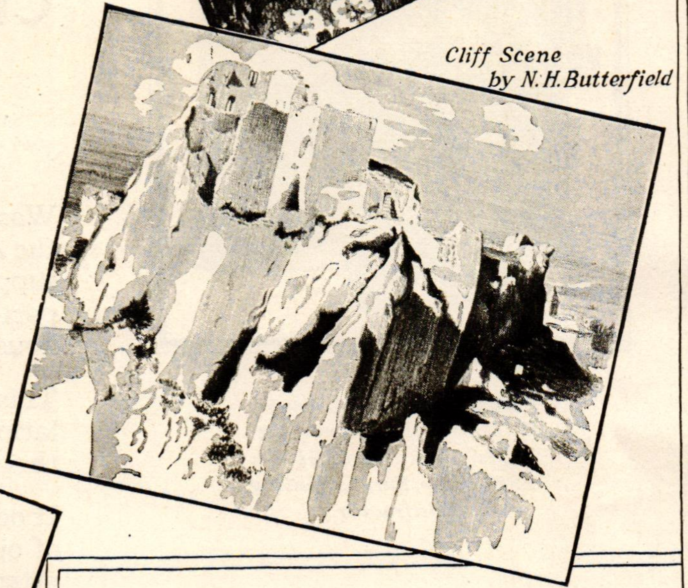

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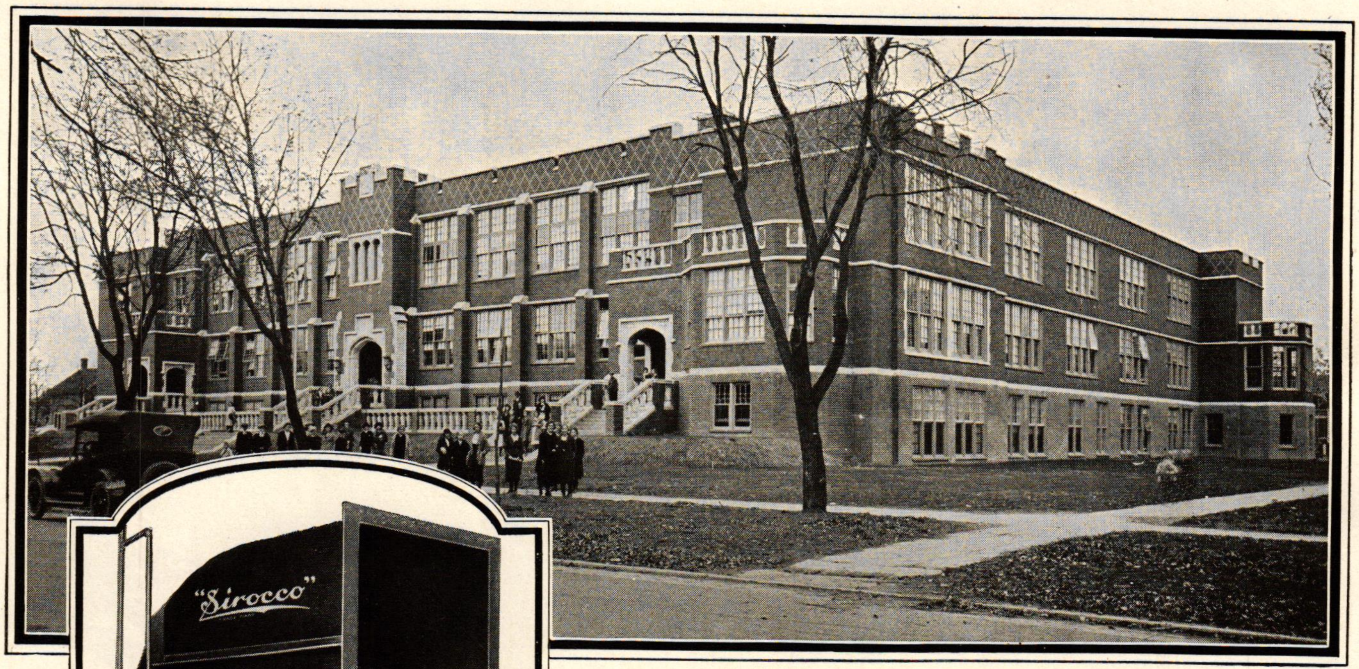

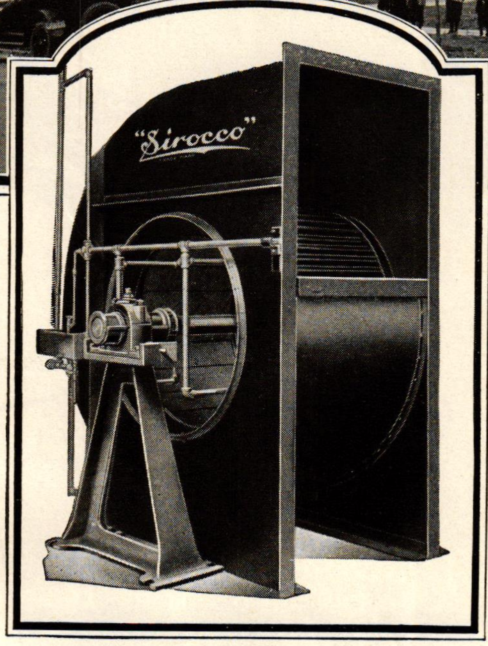

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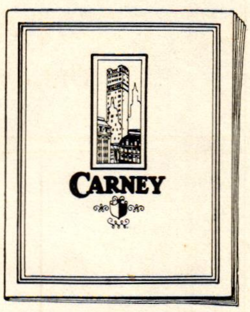

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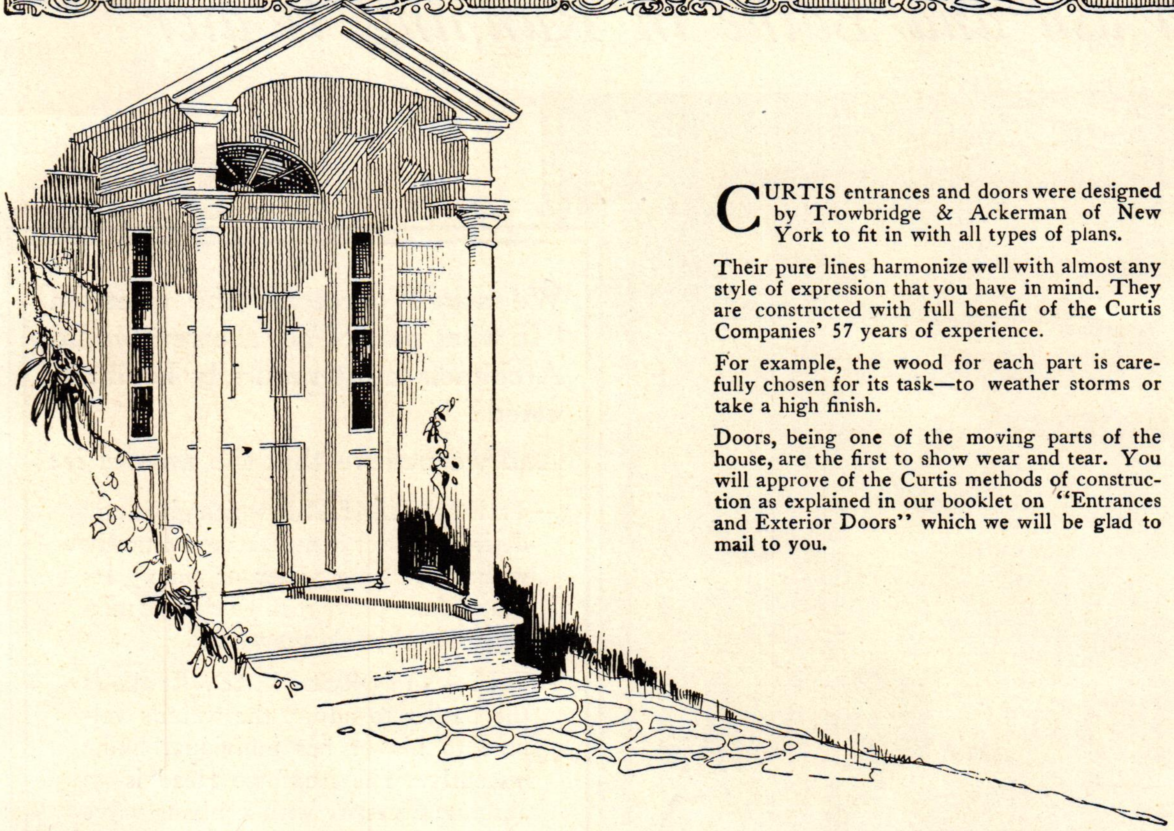

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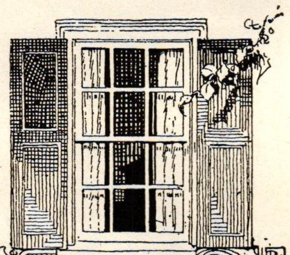
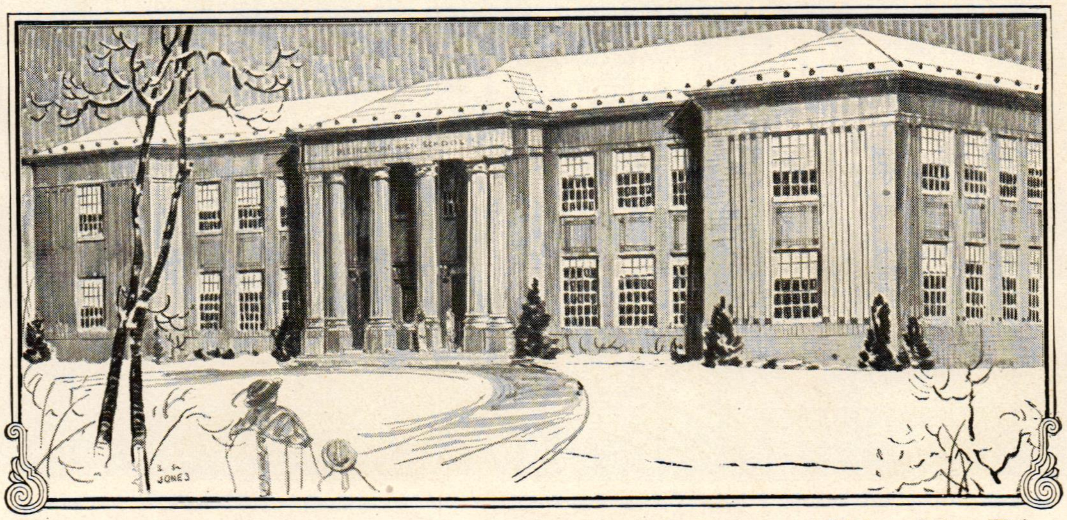
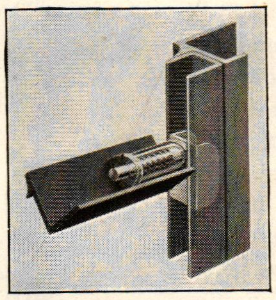


ARCHITECTURAL FENESTRA

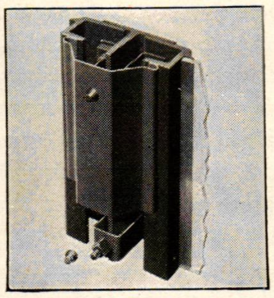


Pietrzycki High School, Dayton, Washington. *Architect,* Wm. A. Wells, Spokane, Wash. *Contractor,* J. J. Lohrenz, Spokane, Wash.

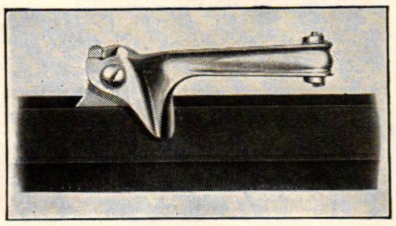
Where Beauty is Made Permanent



Phantom view of Fenestra bronze friction shoe with compression spring. These friction shoes guide the ventilator, insure its easy operation, prevent rattle and assist in holding the windows open at any desired angle.



Cut-away view of pressed steel mullion cover showing clip and method of attaching. Fenestra mullion covers fit tightly against the adjacent jamb members and provide a neat and attractive method of covering the recess between the windows.



Moulded bronze cam handle and bracket, the only hardware needed for ventilators within reach of the floor. No stay bar or chain is needed.

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Architectural Fenestra is fitted with bronze hardware of artistic design, and in fact in every point in its design and construction, beauty, permanence and practicability are carefully combined.

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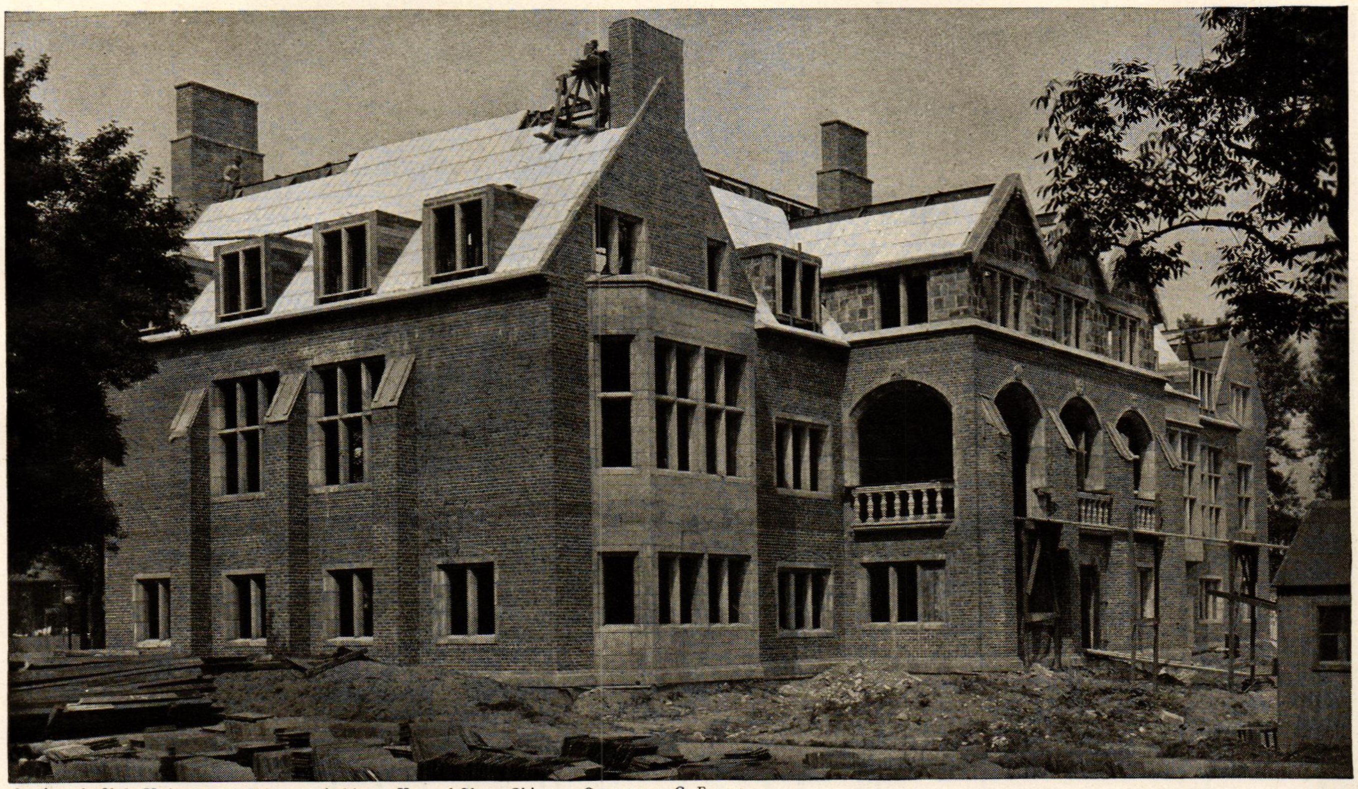

Quadrangle Club, University of Chicago. Architect: Howard Shaw, Chicago. Contractor: C. Everett Clark Co., Chicago. 6,000 sq. ft. 30-in. Pyrobar Roof Tile and 13,208 lin. ft. Pyrobar Floor Tile used

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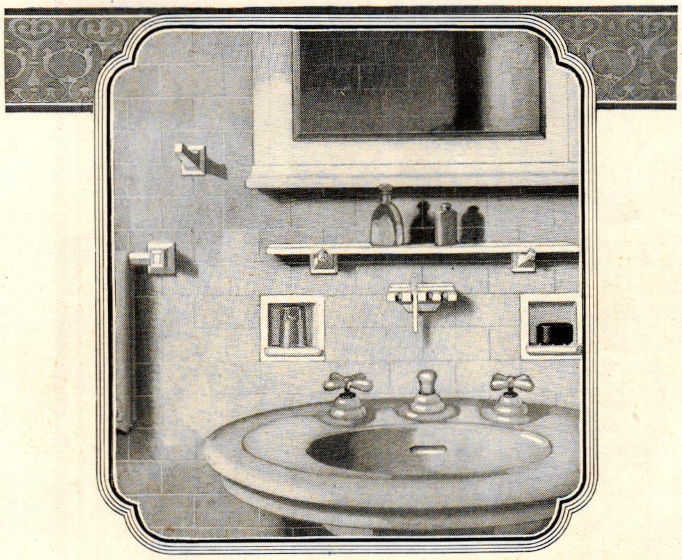

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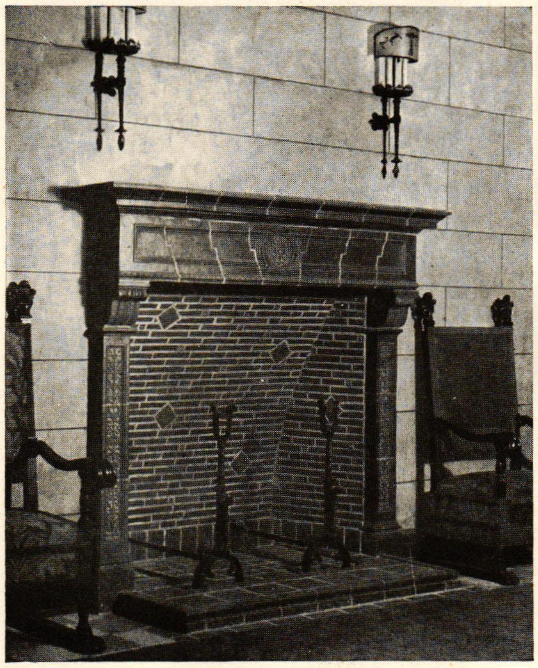

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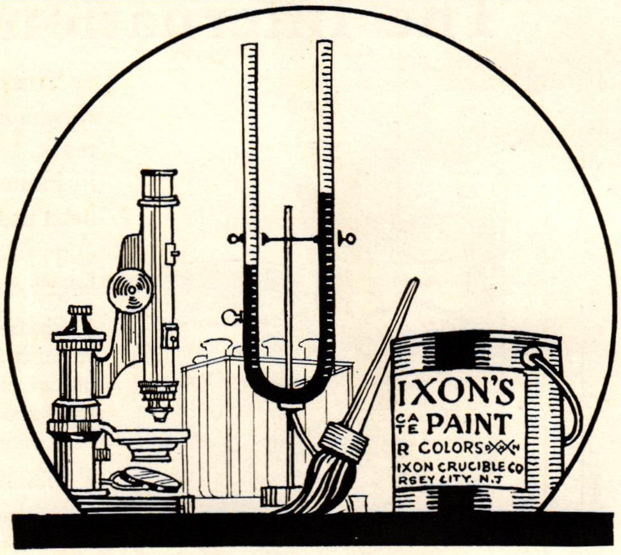

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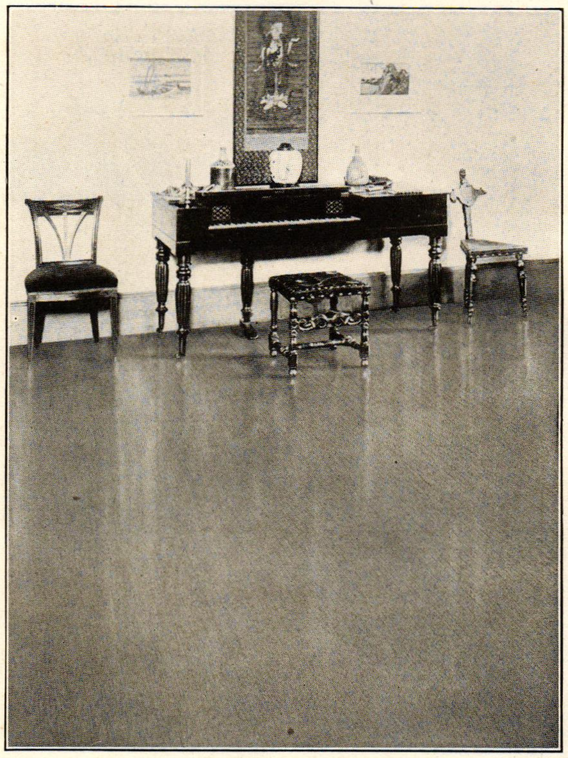

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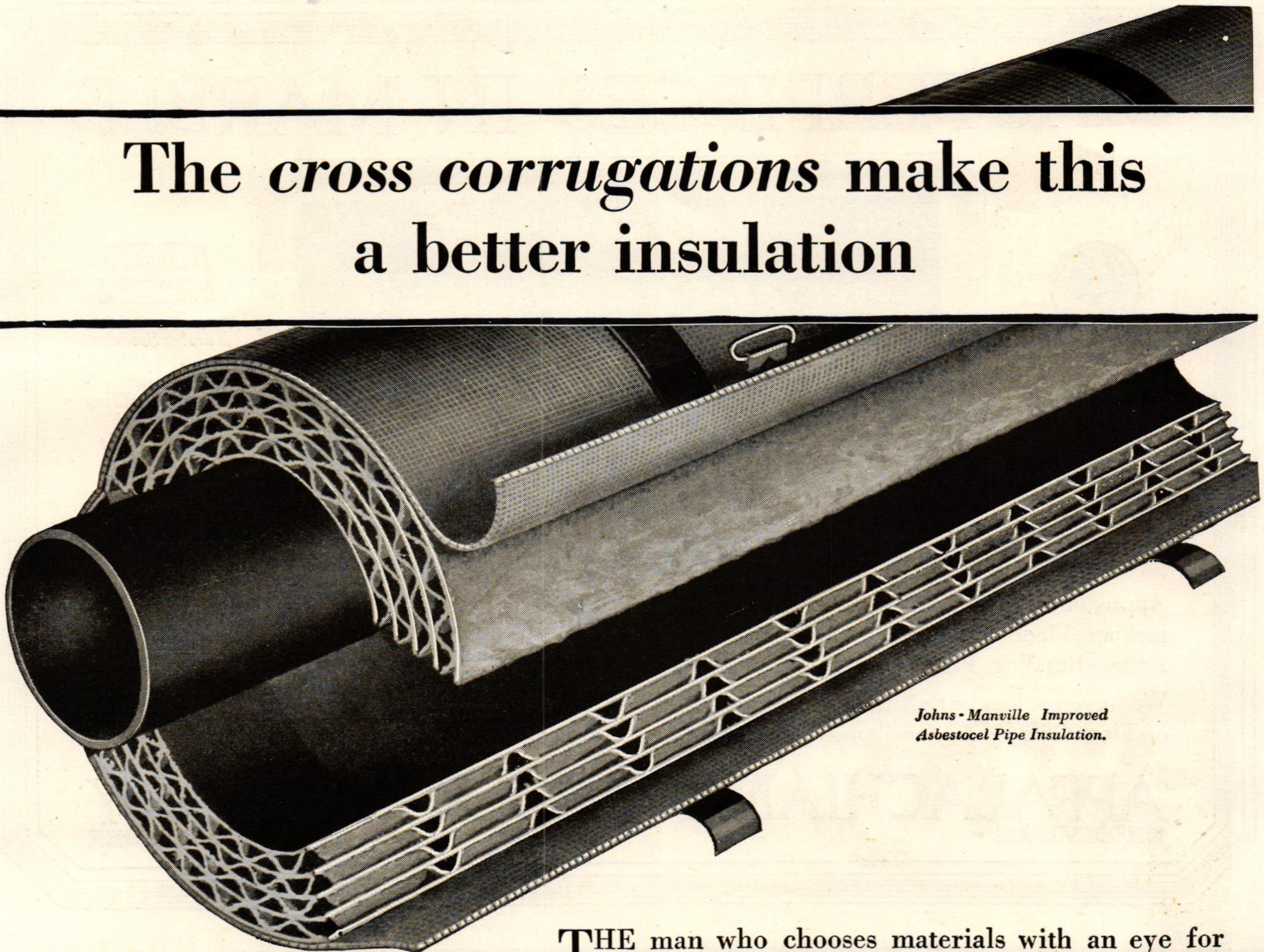

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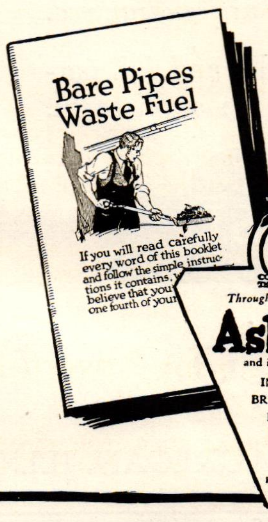

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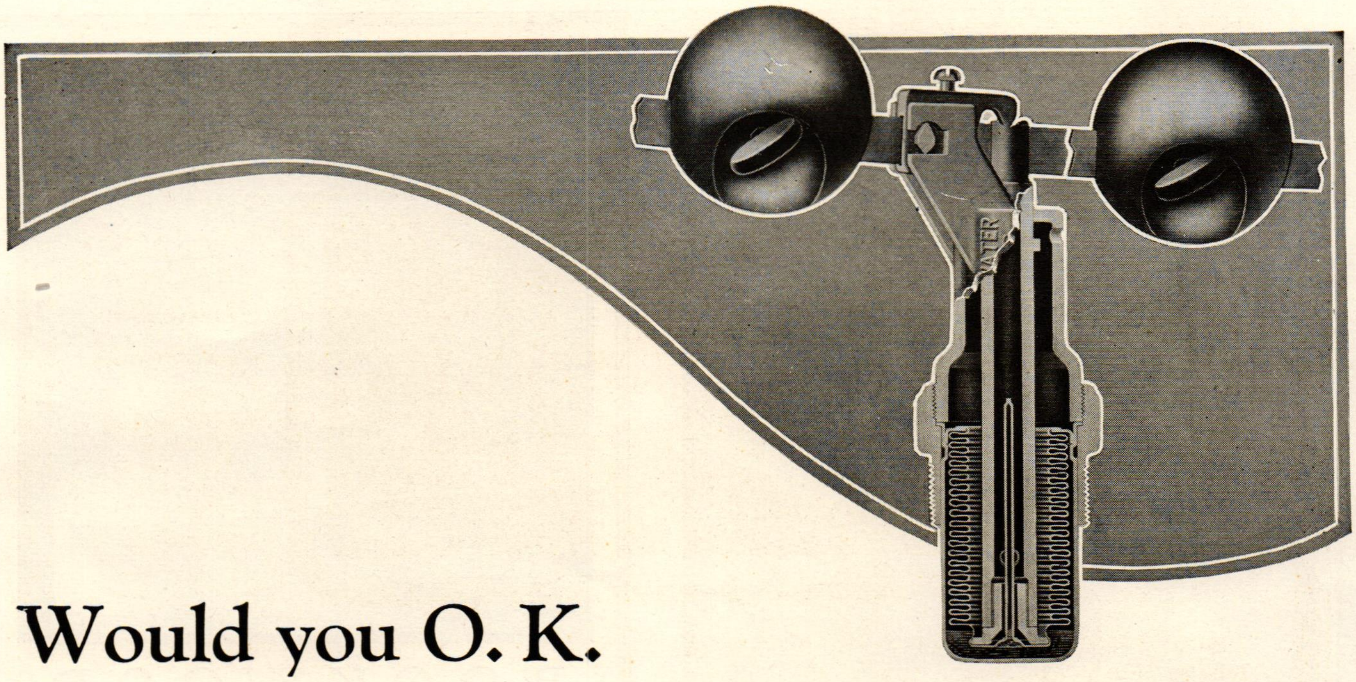

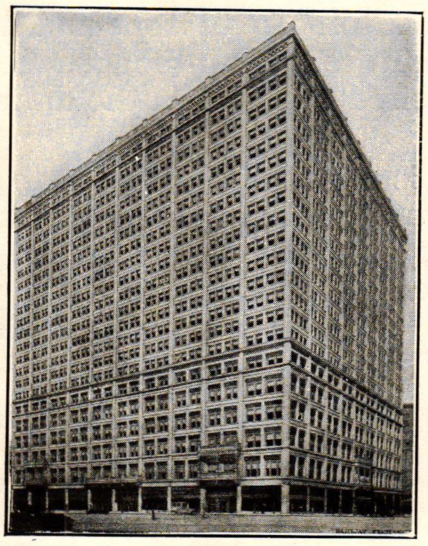

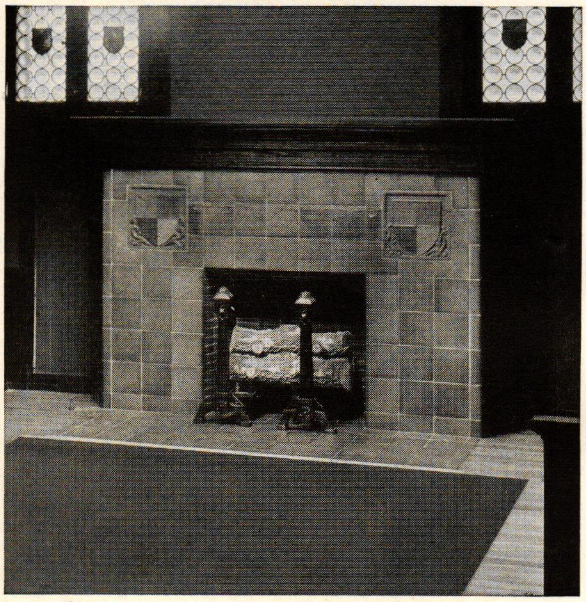

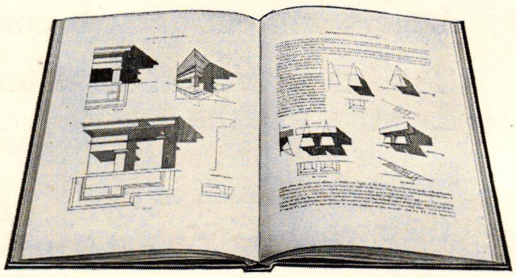

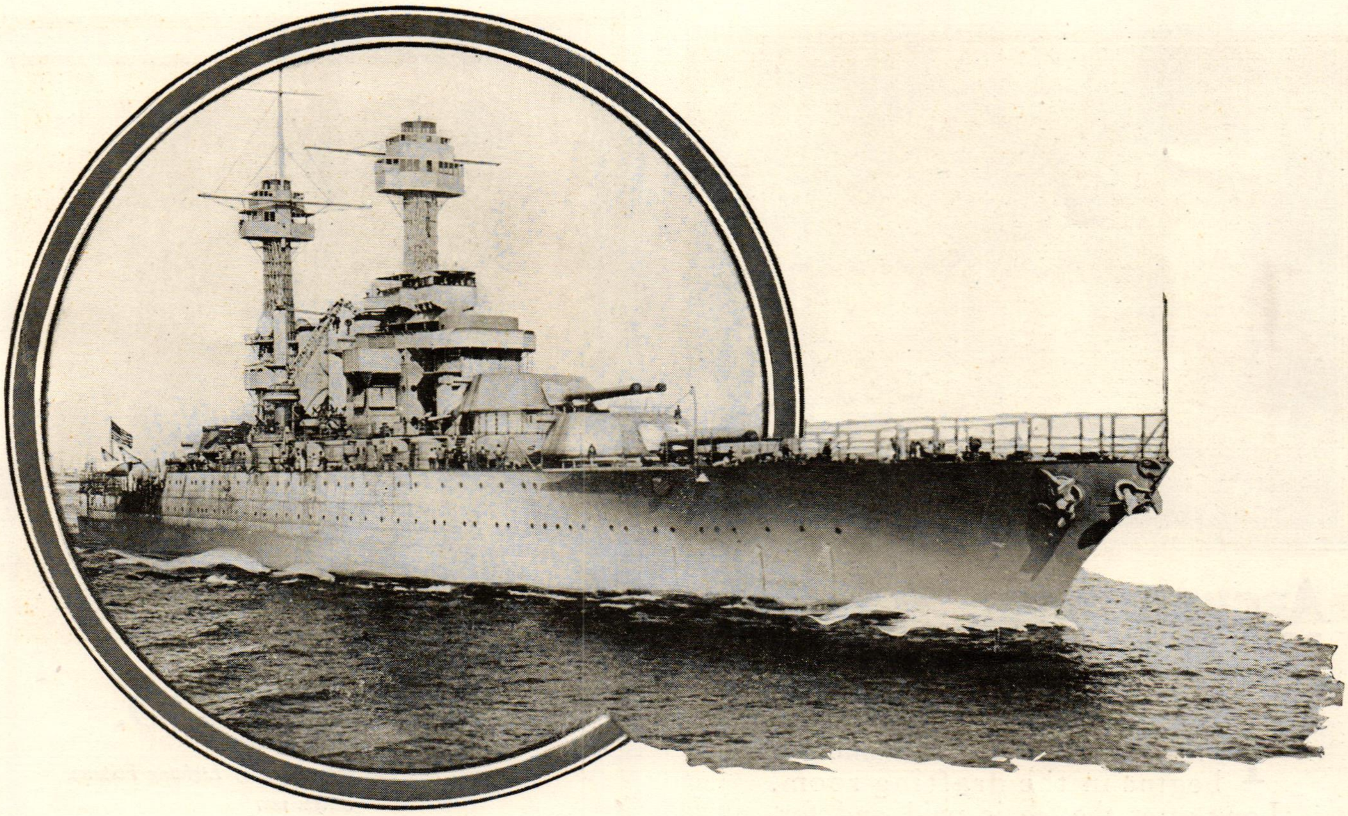

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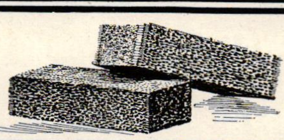

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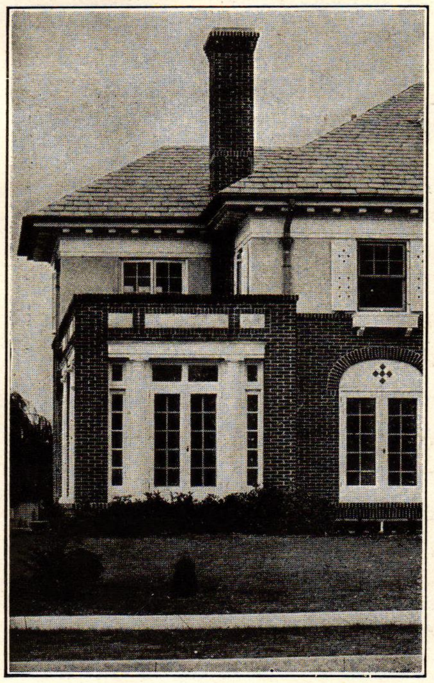

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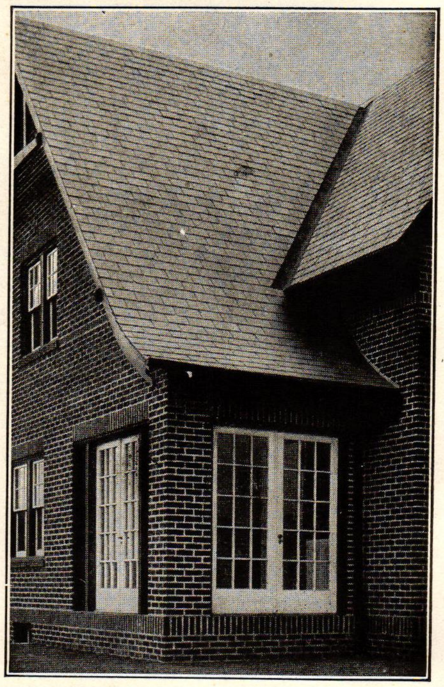

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ARCHITECTVRE

THE PROFESSIONAL ARCHITECTVRAL MONTHLY

Vol. XLVII. No. 2

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PLATES AND ILLUSTRATIONS

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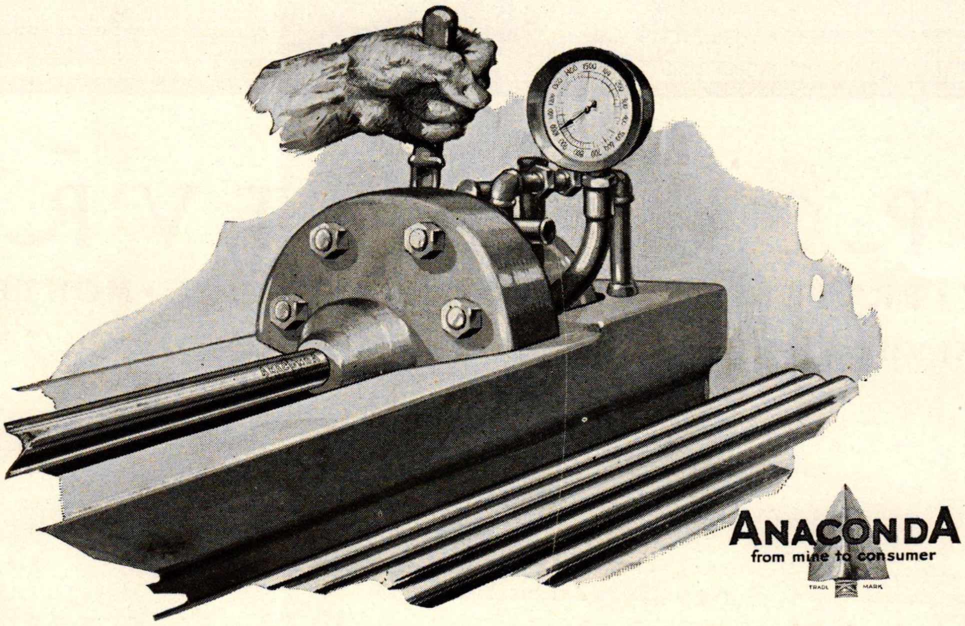

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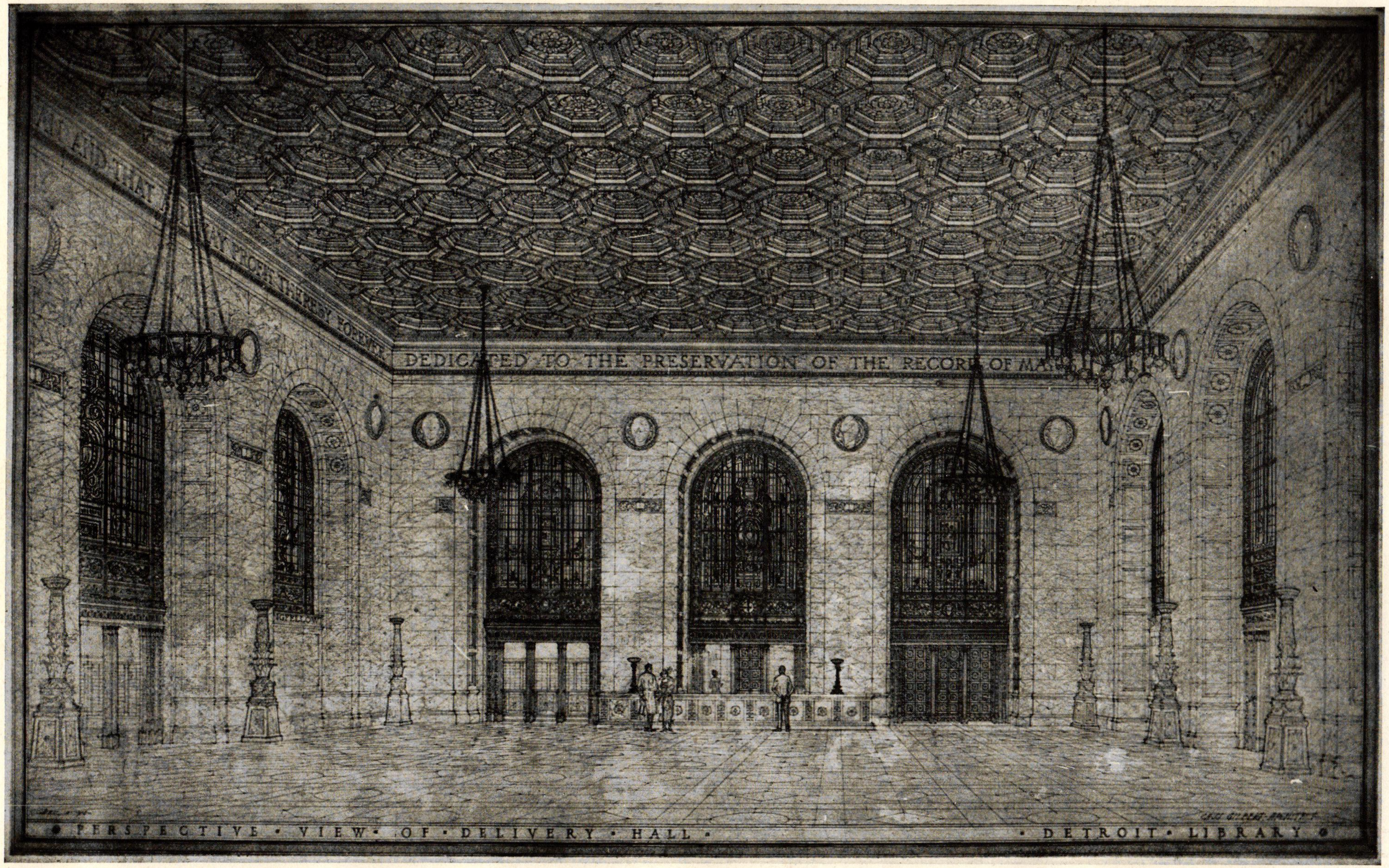


PERSPECTIVE VIEW OF DELIVERY HALL, DETROIT LIBRARY.

Cass Gilbert, Architect.

ARCHITECTVRE
THE PROFESSIONAL ARCHITECTVRAL MONTHLY
VOL. XLVII FEBRVARY, 1923 NO. 2

The Art of Painted Windows

The Windows of the Detroit Public Library

Cass Gilbert, Architect

By W. Francklyn Paris

PART I

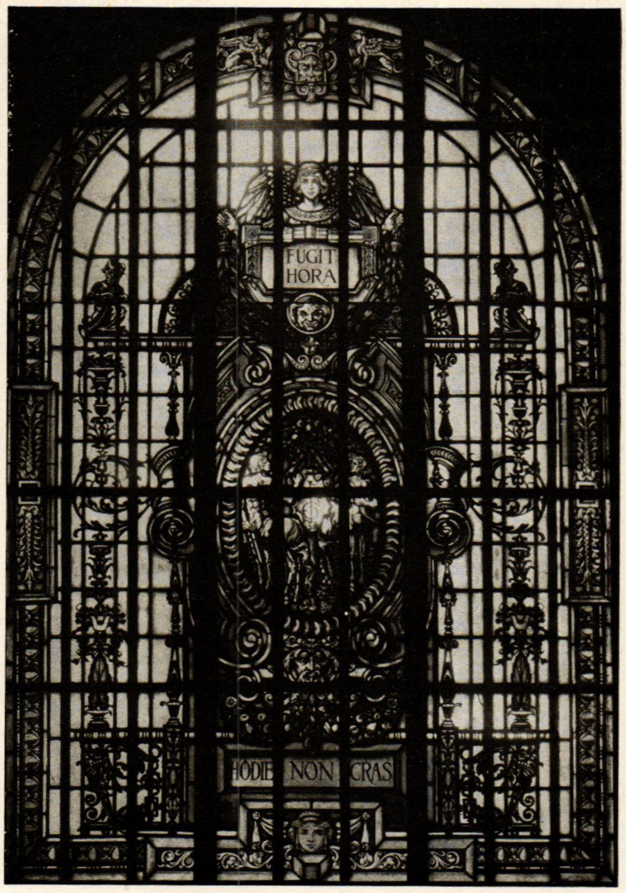
THE lack of a generic word to designate translucent decorations made of colored glass in fragments held together by lead is so apparent that one may be permitted to coin a new descriptive noun, simpler and more accurate than the complicated "stained-glass window." By calling all bays admitting light into buildings through a mosaic of colored glass sutured by lead "vitrals," we escape the criticism that all "stained glass" is not stained, and we gain a short and perfectly intelligible word derived from the French, "vitrail," and which can be applied unequivocally to painted glass and glass colored in the crucible and designated "pot glass."

The vitrals of the Detroit Public Library are "quarry" windows, by which is meant that they are made of painted glass cut into squares after the Italian Renaissance manner. They are notable for sobriety of color and delicacy of line, and having been designed for a purpose, they achieve that purpose, which is the admission of white light into the edifice.

A much more brilliant effect could have been obtained with pictorial windows, filled with figures and resplendent with color, but such windows would have been in violent contrast with the restful gray walls, and, in addition, would have cast a multicolored light in places where anything but untinted daylight would have been a detriment and an offense.

In harmony with the architecture of the rest of the building the design of the windows is inspired by Italian Renaissance precedents, and some of the decorative arabesques used are an adaptation of decorative motives treated in bronze, marble, and mosaic in other parts of the edifice.

The most pretentious and most ornate of these vitrals fills the central wall opening immediately above the delivery desk and the finely chiselled grilles and clock, a delicate lacery of bronze that runs the width of all the arches at a height of ten feet.



Delivery-room window. W. F. Paris and Fred'k J. Wiley.

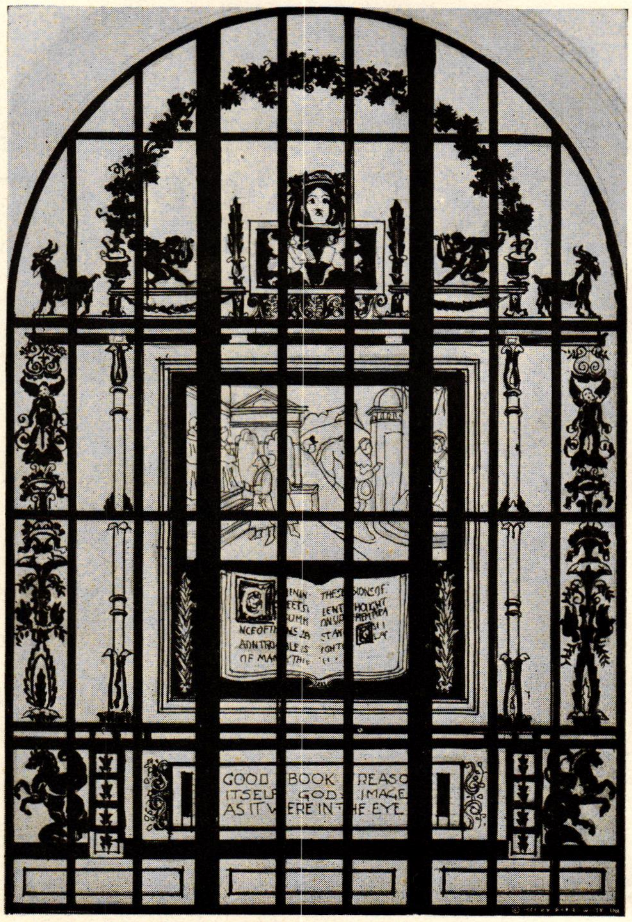
It consists of a central cartouche containing the imprimatur of a forgotten Italian printer of the sixteenth century and of a border made of the classical egg-and-dart moulding, broken by four small panels disposed top and bottom and at either side.

The central decoration is set in a frame of sculptural effect, with a base and top piece brought together by arabesques and uprights suggesting the exquisitely wrought-iron grilles, or rejas, of the Spanish cathedrals. It portrays two centaurs going in opposite directions and stopped on either side of the tree of Knowledge to take counsel. A framed panel at the top of the decoration contains the Latin inscription "Fugit Hora," while a smaller panel at the base contains the admonition "Hodie Non Cras."

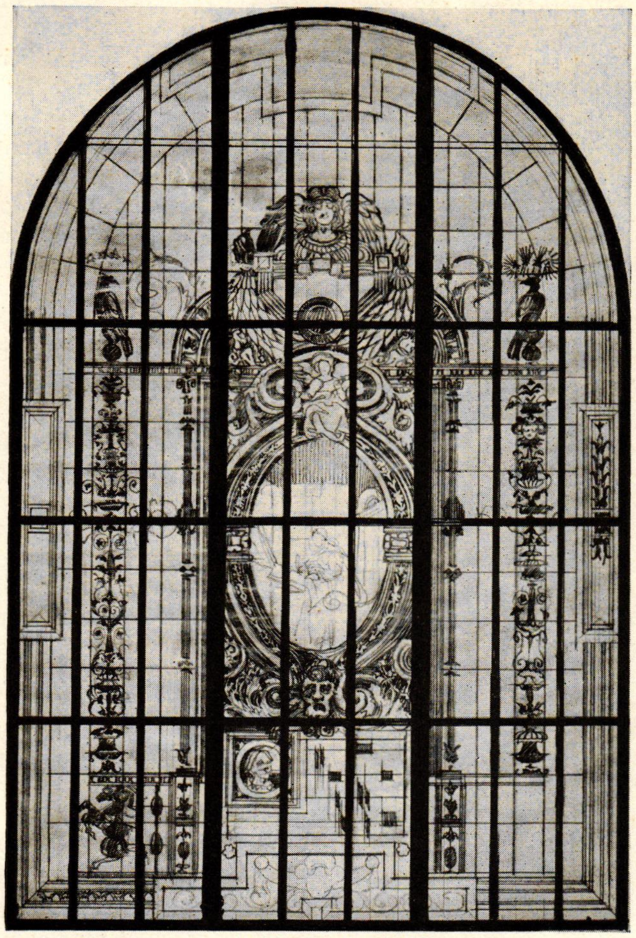
A distinctive feature of this and other windows in the library is that a design is worked in the leads which amalgamates

(*Continued on page* 39)

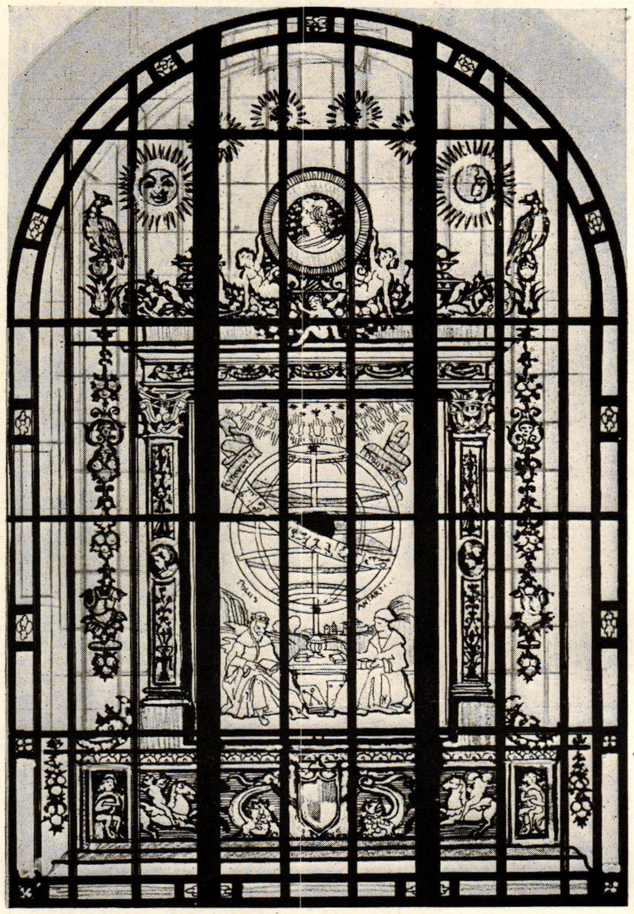
DELIVERY-ROOM, NORTH WINDOW.



DELIVERY-ROOM, NORTH WINDOW.



DELIVERY-ROOM, SOUTH WINDOW.



DELIVERY-ROOM, SOUTH WINDOW.

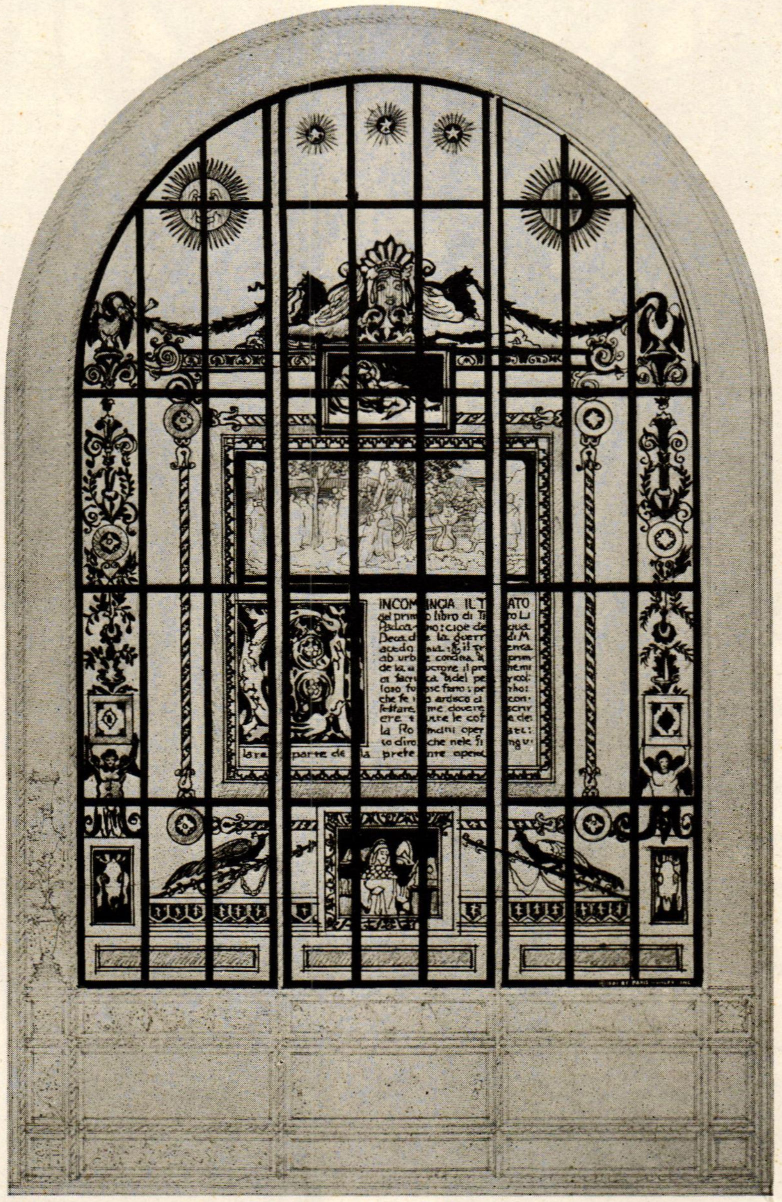
PAINTED WINDOWS, DETROIT PUBLIC LIBRARY, DETROIT, MICH.
Cass Gilbert, Architect. W. F. Paris and Fred'k J. Wiley.

(*Continued from page 37*)

the fragments of painted glass into an uninterrupted surface. Because of the small area to decorate, this design is of necessity largely structural, conforming in its perpendicular and horizontal lines with the mullions of the window, but here and there small arabesques are introduced solely to aid the ornamental value. The general color scheme of the vitral is light silver gray, with here and there a touch of bright color.

The "Centaur" window is repeated twice, each time occupying the central position in the group of three and flanked by two vitrals which are alike on one wall but different on each wall. In other words, the two vitrals that flank the Centaur window on the north wall are different from the two that flank the Centaur window on the south wall and from the two on the west wall. There are three Centaur windows and two each of the others.

The two that serve as pendants on the north wall, as in fact all the vitrals in the room, are homogeneous in character and treatment with the Centaur window. There is general symmetry among them all—harmony of line and color, similarity of decorative attributes employed, and yet each of the four variants is distinctive and conveys its own message irrespective of the others.



Delivery-room, west window. W. F. Paris and Fred'k J. Wiley.

This first set has the general arrangement of uprights supporting a lintel, but there is no border following the outline of the wall opening. A square central panel holds an outdoor scene taken from an old woodcut and an open book on the leaves of which is the following inscription in imitation of missal illumination of the Middle Ages:

> Sometimes let gorgeous tragedy
> In sceptred pall come sweeping by
> Presenting Thebes or Pelops line
> Or the tale of Troy divine.

Floral arabesques occupy the sides and a wreath of conventionalized foliage arches itself at the top following the curve of the wall opening. Dancing figures and the goats of pagan mythology disport themselves over the lintel, while the horses of Apollo are disposed on either side of a panel at the bottom in which is proclaimed the fact that "a good book is Reason itself."

Flanking the Centaur window on the west wall are two vitrals picturing the illuminated page adapted from an old Italian volume on the Macedonian war, with an ornate initial, a pictorial vignette at the top, and the following verse:

> Or call up him that left half
> told
> The story of Cambuscan bold
> Of Camball and of Algarsife
> Or who had Canace to wife
> That owned the virtuous ring
> and glass
> Or of the wondrous horse of
> brass
> Whereon the Tatar king did
> ride.

This is set in a frame suggesting wrought-iron grille work and there is the same arrangement of uprights on either side done in the plateresque manner and supporting a lintel.

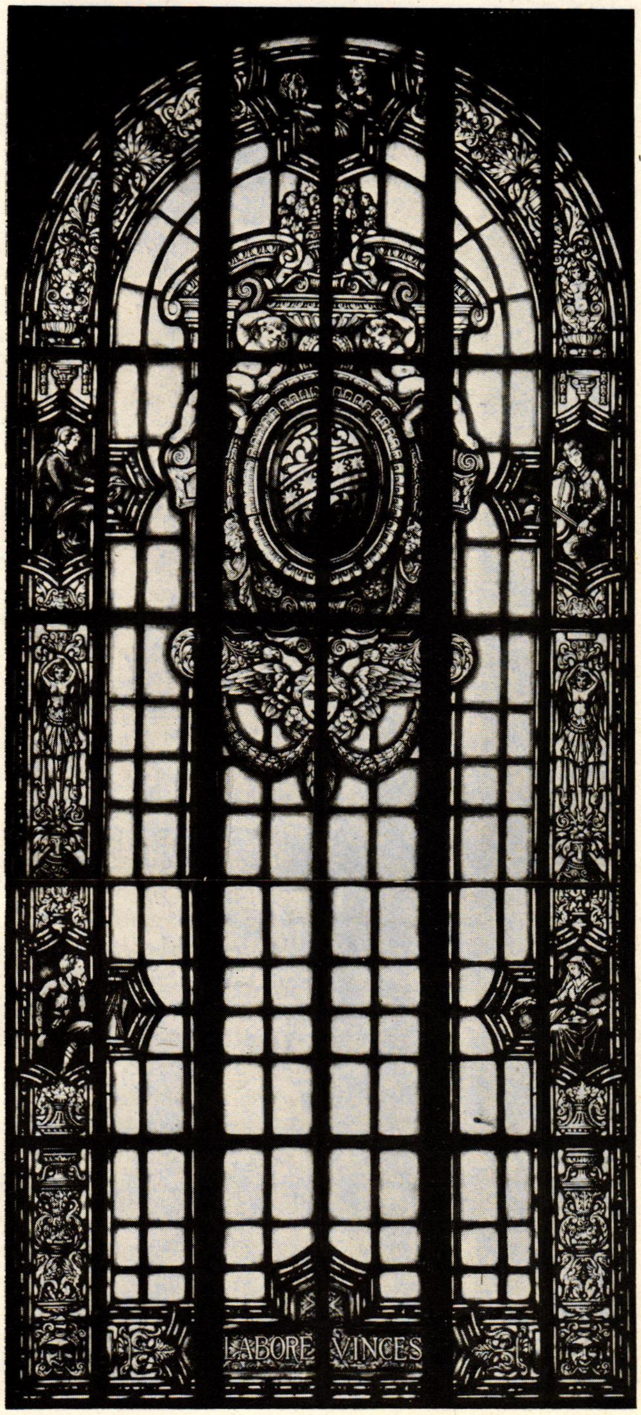
In the semicircular field at the top the planets are disposed on a line following the curve of the arch. Small panels above and below the central decoration contain pictorial scenes representing decorative attributes of the Renaissance period used in the side pilasters; the lintel and base include swans, peacocks, bucranes, and griffins. The whole effect is restful with a monotone color note touched up very soberly with subdued blues and reds.

The vitrals of the south wall, on either side of the repeated Centaur window, are in the same general spirit as the other flanking windows on the north and west walls, but more architectural in design. Here the motive suggests stone rather than wrought iron. The central decoration is a doorway with pilasters, architrave, frieze, and cornice, framing the presentment of an old engraving picturing the early terrestrial globe in bronze and a king and an astronomer poring over ancient tomes.

The moon in its various phases is displayed in the upper part of the window and a group of amorini uphold a shield over the central composition.

The ensemble of these nine windows is in tune with the stateliness of the delivery-room, where the dominant note is one of majesty and repose. To have made them more brilliant in color or ornate in design would have destroyed the harmony of the room.

Elsewhere in the building, however, the opportunity existed for the setting in of rich windows permitting the use of painted glass of a livelier hue. This was in the walls marking



Main hall, north window. W. F. Paris and Fred'k J. Wiley.

Main hall, south window. W. F. Paris and Fred'k J. Wiley.

the ends of the stair-well, over which arches a barrel vault emblazoned with arabesques of gorgeous coloring.

The vitrals which admit light into this stair-well are inspired from the windows in the Audito del Colloquio in Florence, the cartons for which were painted by Giovanni da Udine. A rich border in which are set six pictured panels frames the entire wall opening and sets off a magnificent cartouche of architectural design set in the upper centre of the window.

The north window portrays Study, Art, Music, and Painting in the side panels, and contains the inscription "Conato Perficio" in the panel at the bottom.

The south window is identical as to border, but differs in the symbolical inserts, which in this instance typify Meditation, Sculpture, Music, and Geography. The inscription "Labore Vinces" occupies the bottom panel.

In both windows the central cartouche is an oval set in an ornamental frame, in one case supported by two female figures and in the other surmounted by two amorini. Garlands of laurel depend from the composition, which is sculptural in effect and highly ornamental. The lower half of the windows is of unpainted, or rather very lightly tinted, glass set in very heavy leads arranged in rectangles and squares.

NOTE: In a second article in the March number, Mr. Paris will deal with the technicalities of glass with particular references to some of the most beautiful examples in the Old World.

The Allerton Houses

By Arthur Loomis Harmon

IN New York there are many single men and a comparatively larger number of single women, without family ties in the city, engaged in studies, in the professions, and in commercial pursuits.

A considerable proportion of them coming from smaller communities have to form for themselves entirely new social environments, and modern business organizations, especially financial institutions, take a keen interest in the question of the environment of their employees.

Until recently the housing demands of this body of our population, comprising a considerable proportion of the youth of the city, have had to be met by rooming-houses, boarding-houses, or the regulation transient hotel. Boarding-houses have their distinct limitations, both economic and sociological. On the economic side, not many rooms can be rented in proportion to the area of the plot and ground rentals, and taxes in New York City are not ills which can be overcome by suggestion. Food and service also must be considered.

Sociological limitations are inherent, and we all have in our minds a number of happy communities, particularly when the members are drawn from common sources and are of similar tastes, age, and sex. Those were days when it was your friend's right and privilege to come into your quarters at 3 A. M., drop his suitcase across your recumbent form and sit on it. You might protest, but it did not occur to you to reproach him.

But for the most part there has been too great a diversity of types, ages, and temperament confined in too small a space. Propinquity has prevented as many marriages as it has produced. Hotel accommodations in good transient hotels are more expensive than they are domestic.

The Allerton 57th Street House, New York.

The Allerton Idea

There has been this problem in living accommodations, and the Allerton Houses were developed to meet the need. Large enough to insure a low rental and personal freedom to their members, small enough and club-like enough in their planning and handling to foster a community spirit, the success of this group of houses is the best evidence of the wisdom and energy of its originators, who have introduced a distinct form into the varied life of a great city.

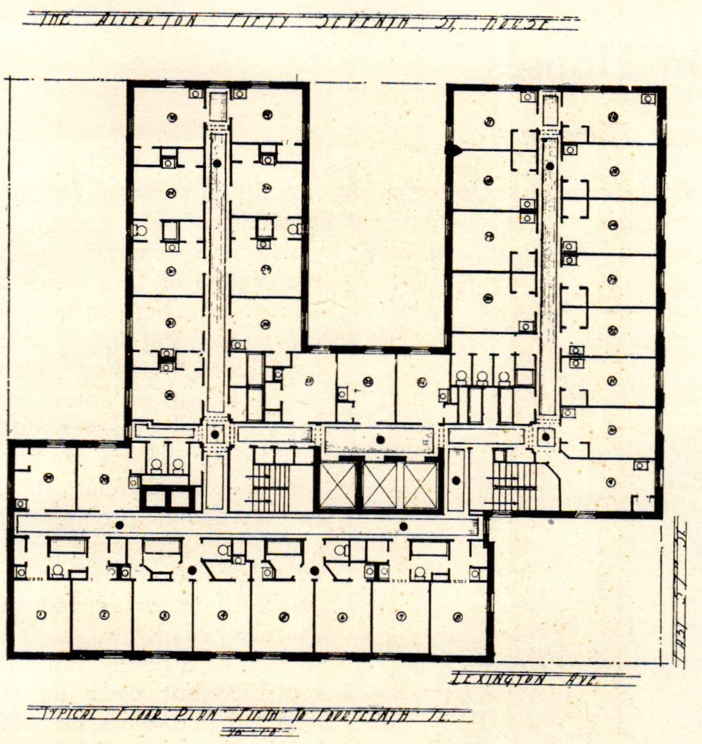
In the design of what we call commercial structures, economic problems become the architect's prime consideration, dictating the choice of materials and the character of his design. The success of a design must be measured not only by its outward harmonies but also by its harmony with the financial conditions of the building as a whole.

The architect is, therefore, between the devil tempting him to ignore the business interests of his client and the deep sea of forgetfulness that his task is something more than the satisfaction of these business interests alone.

Up to a certain point business and pleasure, so to speak, go hand in hand. That is to say, there is a certain earning power in good design and embellishment. Unfortunately, it accords strictly with the usage of the building. In a factory it is considered nil. In a hotel it is much greater than in a loft building.

The façade of a tall building divides naturally into a base, of one or more stories, a shaft, and a crown or capital, of one or more stories. The base is near the eye, and from the business point of view the natural place to spend money for expensive material and enrichment. It seems to me that this is somewhat overestimated and frequently overdone to the detriment of the building as a whole. An inexpensive shaft is more or less an economic necessity.

The crowning of the building demands artistically some expenditure. If it does not require it for business reasons, it is usually considered by the owner as a waste of money and a concession to architectural foolishness. With few



exceptions there are always necessary compromises between onwer and architect in such matters. The architect is too prone to look upon his client as a Philistine, even though he sometimes takes from him the lone piece of embellishment on which he relied for effect, his one pet ewe lamb.

The purpose of the Allerton Houses is to give a better grade of living accommodations at a low cost, to raise the standard but not the price. This means the elimination of all non-essentials and extravagance in construction. An honest attempt has been made to meet these requirements in the design of these buildings and conform to the economic necessities.

In the matter of exteriors, most of the expense of both base and capital has been done away with. The shafts are of a quite inexpensive red brick and spring almost from the sidewalk. Accepting the limitations of material, there has seemed no choice but to use North Italian details or invent them. Fortunately, the architect prefers the North Italian. Whether you like these façades or not, you must admit that they cannot be accused of increasing the prices of the rooms within.

The handling of the brick surfaces is an attempt to give interest to these surfaces and character to the material. The brick are laid as irregularly as the deadly mechanical perfection of the modern mason will permit. That is very little. There are apparently no little irregularities in the rectitude of his daily existence. One of them told the architect that he would do it that way, but "he would be damned if he would admit working on it." To-day, with jobs plentiful, he would probably leave the scaffold. The deep-raked joint which is practical in this porous brick is a considerable help in obtaining surface texture.

In the 39th Street and 55th Street houses, the second floors are occupied by bedrooms over a low entrance floor, and the lounges are, of necessity, in the rear. No opportunity was given for expressing these lounge spaces on the exterior. In the 39th Street house, the roof-garden above helps to make up for this. In the 55th Street house, the low arcade across the lobby and arched windows of the solarium above help to give character. In the case of the 57th Street house, however, two higher public floors, joined by the open well in the lobby, make it possible to obtain an effect with large arches through both floors.

The attempt has been made in each of these buildings by restraining the projection on the street façade and carrying some suggestions of their treatment around the other faces, and by enclosing tanks, elevator machines, etc., in a central penthouse, to produce the effect of a tower complete on all sides, built "four-square to the winds." The appearance of height has been fostered by the accenting of vertical lines and the elimination of all horizontal ones. We accept too easily the surveyor's plot plan as final. It is not a virtue that at 150 or 300 feet in the air a building should declare to the observer: "This is my street façade, but this wall is on the lot line—it would be affected of me to conceal the fact."

The interiors of the various public rooms are Renaissance in character, Italian, or closely akin to it. The lounge of the 39th Street house is probably the most successful, perhaps because it is the most completely finished. In the design of these rooms, the desire has been to avoid a large or rich hotel effect and to accent the club and domestic characteristics of the houses.

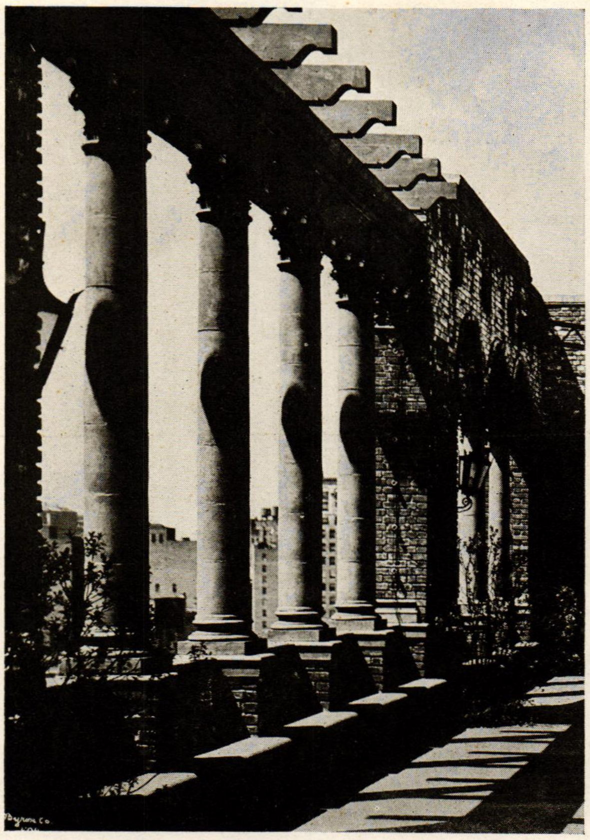
In general, the scheme of the bedroom floors is small but complete rooms, a certain per cent to share baths and toilets with the adjoining rooms, the remainder to use those located in the corridor in small convenient groups. Each room has its own lavatory, and in the public groups, toilet and bath facilities are kept separate. In planning such a structure, the typical floor is, of course, the important factor. It is repeated a great many times and is the source of revenue of the enterprise. The layout of the lower and upper floors must be determined within such limitations as the best interests of this plan permit.

The main artery of this body of bedroom floors is the elevator group, of which the rooms may be said to be the capillaries, and the windows the pores in the skin. The number of rooms per floor is in direct relation to the perimeter of this skin of wall surface. The amount of wall surface de-

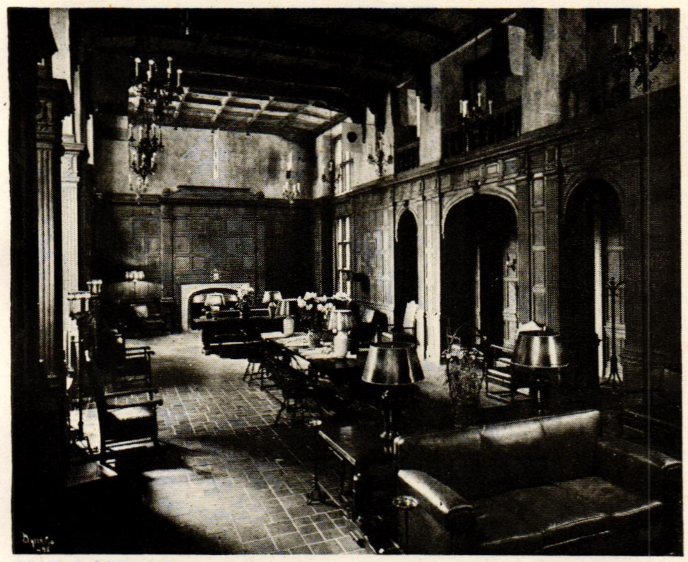
(Continued on page 44)

Detail of 57th Street entrance. The Allerton 57th Street house.

THE ALLERTON 39TH STREET HOUSE.



PERGOLA ON ROOF.



THE LOUNGE.

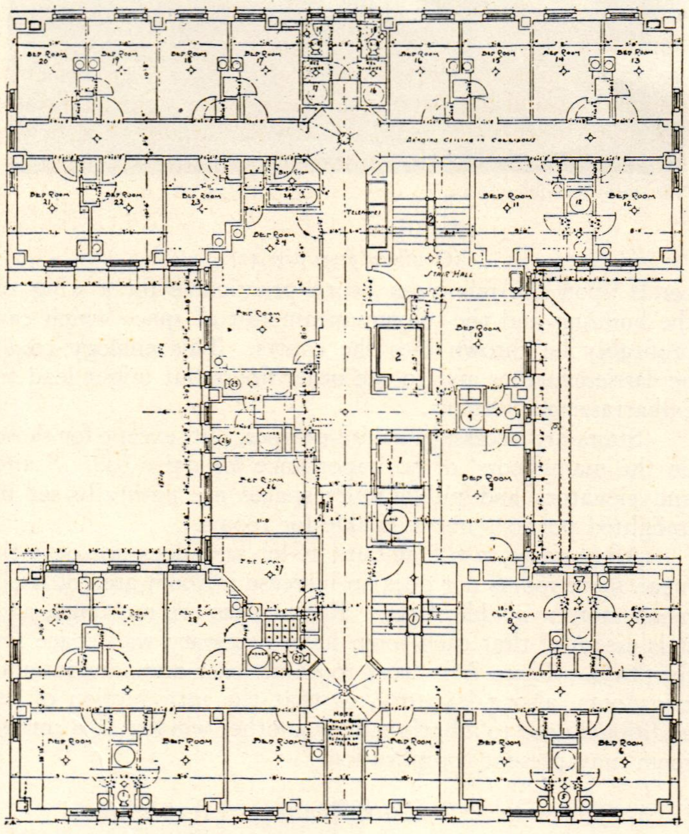


PLATE 183

TYPICAL FLOOR PLAN

THE ALLERTON 39TH STREET HOUSE, NEW YORK.

Arthur Loomis Harmon, Architect.

The Allerton 55th Street House.

(*Continued from page* 42)

pends upon the minimum depth practicable for a wing of the building and the maximum amount of space which can profitably be thrown into the courts. This analogy could be carried further and to the other floors but might lead to embarrassing questions.

Stairs are necessary as fire-escapes, but, except for those on the main floors, of no importance for daily use. Stairs and elevators and public-toilet spaces are naturally set in unlighted portions not available for rooms.

An increase in the amount of lot area does not of itself mean more rooms nor does an increase in room area of itself mean more available space. Room areas are not large, and it is essential that each room have necessary wall space for furniture. There is in each room at least one window and two doors, also a lavatory, so that the introduction of an additional door to a bathroom or another window in a corner room may present complications.

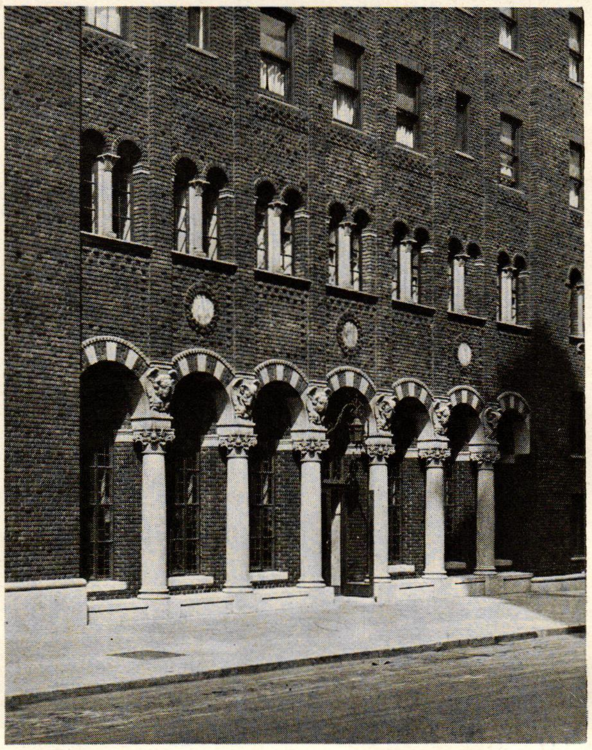
The Plans

In all cases the restaurants have been laid out in such a way as to permit the room being used for self-service or for waiter service, with the self-service space acting as a serving pantry. One elevator is arranged for both public and service use, and connected with linen-rooms, baggage-rooms, kitchens, etc. The 57th Street house shows a room area only slightly larger than that in the 55th Street house, but the relation of this to the total cube is, for the reasons given elsewhere, not quite as good. The 39th Street house, owing to its location, is not complicated by the necessity to introduce stores on the ground floor. The basement is occupied by boiler-room, trunk storage, kitchen, billiard-room, etc. The first floor has a women's reception-room. On the right of the entrance is a small restaurant; on the left, elevators and office; in the centre, with a lounge across the rear, running through two stories, with a low library and a writing-room opening from it. In this building the desk is behind the elevators.

Above this are thirteen and half floors of bedrooms, in all about 400 rooms. By varying the roof levels, the roof-garden is reached by a half flight down from the solarium. A gymnasium balances in the rear wing, the roof-garden in the south. A low story below the solarium provides offices, etc., for the gymnasium. The roof-garden is enclosed with a colonnade and arches to offer a screen against the pressure of the open space and sky, and to break the vista into a series of picturesque effects. The roof level is raised above the street, to give planting spaces level with the walks. The boiler-flue is brought out through the iron lantern.

In the 55th Street house there is a basement and a sub-basement containing the same features as in the 39th Street house, and basement storage for the stores which the location on Madison Avenue demands. These stores occupy the second as well as the first floor along the avenue.

On the first floor the front is occupied by a large lobby with the elevators, the desk at one end, and the mail-boxes and shopping service at the other. Height is obtained in the lounge by lowering the floor level. There is a small library off the lounge and a writing-room in a gallery above. In this, as in all cases, the service entrance is in close proximity to the office. That portion of the second floor not occupied by shops is a bedroom floor. There are above the



Detail of 55th Street entrance. The Allerton 55th Street House.

second floor fourteen floors of bedrooms arranged much as in the 39th Street house, with a total of about 450 rooms. The roof contains a solarium and roof-garden, and also the restaurant and kitchen.

An Allerton House for Women

In the Allerton 57th Street house, the basement and subbasement contain, in addition to the requirements of the 55th Street house, a large kitchen and a guests' laundry.

The main features of the first floor are two shops on 57th Street, a restaurant on Lexington Avenue, a central lobby, office, and reception-room. All these spaces are larger than in the others. In addition, the entire second floor is given over to a lounge, forming a gallery around the lobby below, smaller sitting-rooms, parlors, and a second restaurant over the one below and a private dining-room.

On the bedroom floors the rooms are about the same size as in the other, but the closets are much larger; showers have to give way to bathtubs—not entirely, however, as one or two have been retained—a testimony to the influence of women's college gymnasiums. There are almost 500 rooms in this building. The roof floor has, in addition to the usual roof-garden and solarium, a large room which can be used for dances or meetings, with facilities for serving refreshments. There are also music-rooms in the penthouse.

Women have so often said: "Why don't they build an Allerton House for women?" The one at 57th Street is for women, and its plans contain some of the answers. Superficially the plan is about the same as for the men's houses, but on the bedroom floor, closets must be larger and bathtubs used rather than showers. The chief difference is in the public spaces. Women want to feel at home where they live. Men are apt to feel at home somewhere else.

In the men's hotels the reception-room may be restricted. In a women's hotel the lounges must be bigger, so must the restaurant, and there must be a number of smaller sitting-rooms and parlors. The woman guest should have opportunity to receive and entertain as nearly as possible as she would in her own home. In short, women take up more room around a hotel than do men. The public space in the 57th Street house is about double what it is in the others, and public space is a charge which must be carried by room rentals.

A Public Service

THE organizers of the Allerton House Corporation have been guided by wise counsel, an evident understanding of special needs in these congested times, and a realization that old ways of living for many men and women of refinement were becoming intolerable, if not impossible. The hotels for men have offered comfortable and attractive quarters combined with something of a club atmosphere, and they have been successful from the beginning. The newest Allerton House is for women only, and it promises to be not only a popular and most desirable home for business women but as well a centre of important civic interests.

The Vassar Club has taken a floor and the Church League has also leased extensive quarters.

The president of the Allerton Corporation is James S. Cushman, and associated with him are many well-known men and women interested in civic welfare and the improvement of living conditions.

Among these are: Arthur Curtis James, Mrs. Willard Straight, Mrs. Elon Hooker.

William H. Silk is secretary and treasurer.

—Editor.

New Method of Measuring Sand Makes Concrete More Reliable

THE reliability of concrete construction is likely to be increased, and the cost in some cases reduced, by the application of a newly developed method of measuring sand, which is now being tested at the Bureau of Standards of the Department of Commerce. The method has been termed the "inundation method," and consists of measuring sand in a container which has been partly filled with water before the sand is put in, so that when the sand is in, the water is up to the top and the sand completely soaked.

The volume occupied by a given amount of sand when shovelled into a measuring device varies with the moisture content of the sand, the difference in measured volume between dry and moist sand being usually from 10 to 15 per cent, and occasionally running as high as 50 per cent. But it is found that if the sand is completely soaked, or "inundated," uniform measuring results can be obtained no matter how much the original moisture content may have varied.

In making concrete, the proportions of cement, sand, stone, and water are so chosen as to get the required strength and workability with a minimum of cement, since the cement is the chief factor in the cost. Inaccurate measurement of the sand may result in too large a proportion of sand, in which case the concrete is too weak; or in too small a proportion of sand, and hence a concrete too rich in cement.

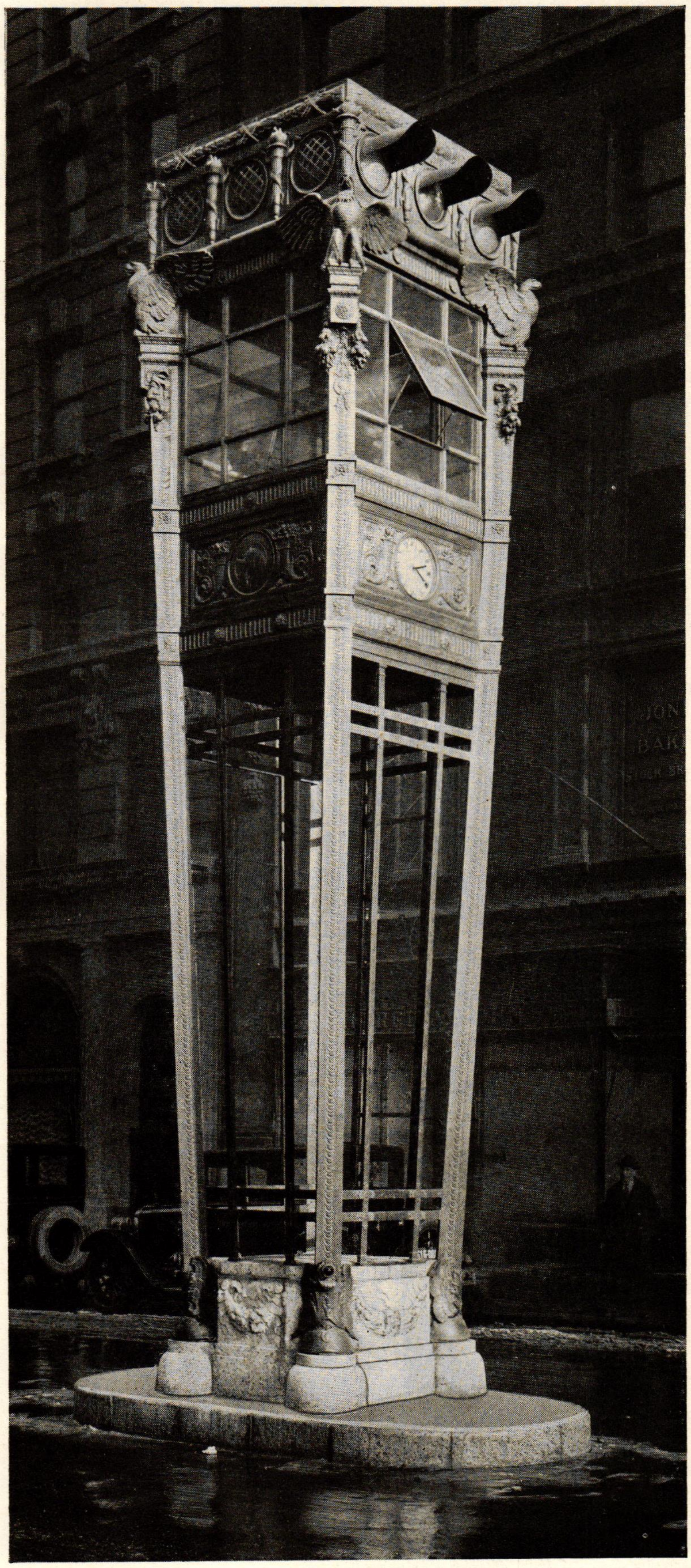
But this rich concrete is not necessarily stronger than the concrete the contractor intended to make, for the sand has brought in some water in addition to that which is added on purpose; and if this extra water is not allowed for and the amount of water added correspondingly decreased, the concrete will contain too much water. It will be sloppy, and when set will not be dense enough to give the necessary strength. The contractor, therefore, is merely wasting cement and doing good to no one.

It is hoped that with the inundation method it may be possible to specify concrete by the strength required rather than by arbitrary proportions. The contractor can then find the proportions of the materials he is using that will give the requisite strength, and can adhere closely to these proportions. The result will be a concrete whose proportions are more nearly what they were intended to be, and with which a lower factor of safety can be used.

Chicago's "Own Your Home" Exposition

AN Architectural Committee representing the architects of Chicago has been appointed by Alfred Granger, president of the Illinois Chapter of The American Institute of Architects, to co-operate with the Chicago Real Estate Board in staging Chicago's Third Annual "Own Your Home" Exposition at the Coliseum, March 24 to 31, 1923, under the auspices of the Chicago Real Estate Board. Robert C. Spencer, Jr., has been named chairman of this committee and the following members appointed: R. S. DeGolyer, Charles H. Hammond, J. C. Llewellyn, Elmo C. Lowe, F. W. Puckey. This committee in co-operation with another committee to be appointed by F. E. Davidson, president of the Illinois Society of Architects, will submit, for the consideration of the Committee of Administration of the Exposition, plans for a five-room bungalow which will be built in the centre of the Coliseum floor as the feature attraction of the exposition.

The New Bronze Traffic Towers on Fifth Avenue, New York



THE regulation of traffic, particularly on Fifth Avenue, is one of New York's greatest problems. A new idea for controlling the traffic by the use of an interchangeable colored-light system was proposed in 1920 by Special Deputy Police Commissioner John A. Harris.

Towers constructed of steel and wood to demonstrate the feasibility of the lighting-signal system were erected, and, during the two years of operation, found to be more practical than any other traffic-regulating system known. It was found that while the number of vehicles passing on Fifth Avenue increased fourfold since the temporary towers were erected, yet they were handled with much less difficulty and confusion than before.

The Fifth Avenue Association objected to the unsightly structures erected along the avenue, but, realizing their practical value, decided to replace them with artistic, monumental bronze towers.

The congestion of thoroughfare and the practical requirements had to be taken into consideration in creating the shape and form of the towers. The most essential problem was to occupy the least possible space and to leave the view unobstructed.

A commission appointed by the Fifth Avenue Association selected the John Polachek Bronze and Iron Co., of Long Island City, intrusting it with the execution of the new bronze towers, from a design prepared by Mr. J. H. Freedlander.

The construction of the towers was a very unusual and rather difficult problem, but was carried out in a most painstaking, ingenious, and artistic manner. The various mechanical apparatuses, such as synchronized clocks, bell-striking devices, different signal-lights, telephones, heaters, etc., connected by a mass of wires to the Edison Co., Western Union, and the New York Telephone Co. systems, are skilfully concealed within the construction.

To place on a public thoroughfare for a utilitarian purpose structures of such artistic craftsmanship is of importance to the entire city. The unconscious effects of the beautiful on the minds of the public is a substantial contribution to better citizenship. This was understood by the Greeks and Romans, and their attainments in the arts have been a beacon light to all later peoples. To understand the beautiful is to create a love for the beautiful, to widen the boundaries of human pride, enjoyment, and accomplishment. A substantial contribution to the sum total of good taste in any community justifies the most careful thought and effort of its leaders. With a wider recognition of this fact, we shall find those charged with the administration of our communities insisting that artistic symmetry be combined with utility in the development of every public improvement.

Editorial and Other Comment

A Novel Competition

THERE have been a number of interesting recent competitions, the great one, of course, being that for the new building of the Chicago *Tribune*, won by John Mead Howells.

This was conducted along the usual lines with a jury of selection to decide upon the winning designs. It has remained for one of our great manufacturing concerns to institute a competition in the form of a lottery.

The Johns-Manville Co., wanting a new building and wanting to avoid any invidiousness in the selection of an architect (they have business with nearly every member of the profession in the country), decided to invite a selected group of twenty-three firms to a luncheon and have them draw lots for the privilege of designing the new building. It was certainly a novel idea and happily enough appealed to the sporting instincts of all concerned.

In his letter to the architects, Mr. Manville wrote:

"We are contemplating the erection of an addition conforming in all respects to the building which we are now occupying at the corner of Madison Avenue and Forty-first Street.

"In view of the fact that we have a great many friends in the architectural profession, we are reluctant to designate an architect for this work, and it has occurred to us that you would find no objection to the following plan: The selection of a limited list of competent architects under whose direction we have executed considerable work, asking them to have a representative accept our invitation for luncheon at the Union League Club at 12.30 o'clock, Thursday, Jan. 4, at which time the architect will be selected by lot.

"We realize the above method is novel, but we hope that you will appreciate our point of view in adopting this method of selection."

Mr. Manville carried the principle of impartiality to customers to the extent of arranging them in alphabetical order in making a list of the persons and firms represented at his luncheon, which were as follows:

Don M. Barber, Welles W. Bosworth, Carrère & Hastings, Cross & Cross, Delano & Aldrich, Cass Gilbert, Helmle & Corbett, Robert D. Kohn, Ludlow & Peabody, McKenzie, Voorhees & Gmelin, McKim, Mead & White, Benjamin W. Morris, Kenneth M. Murchison, L. F. Pilcher, John Russell Pope, George B. Post & Sons, James Gamble Rogers, Starrett & Van Vleck, Trowbridge & Livingston, D. Everett Waid, Warren & Wetmore, and York & Sawyer.

There were twenty-two blanks put in a hat with an extra one containing the cheering words "You Win"—this was drawn by Ludlow & Peabody. The luncheon was a pleasant occasion and brought out a lot of good-natured comment.

We wonder what will be the nature of the next novelty competition for a new building. There are many ways in which a choice of architects might be made without seeming to unduly favor any particular firm.

This method of putting the responsibility of choice on the architects themselves willing to take a chance, not upon their professional skill, in this case assumed to be of equal value, may bring forth offers of a prize for the best score in golf or lawn-tennis, or if it should be a competition for a country house, in a good old game of pitching horseshoes.

There was something nice and friendly in Mr. Manville's letter and in his reasons for resorting to such a novel plan, and there was a fine spirit of good sportsmanship upon the part of the architects who rose to an occasion that called for a forgetting of their own sense of self-importance and acceptance of a game in which all had an equal chance.

Altogether the affair seems to us to have been rather good fun.

Mr. Gilbert's Plea for Better City and Town Planning

IN a recent address before the School Art League of New York, Mr. Cass Gilbert, always one of the most generous of critics, was quoted as saying that "there are no uglier buildings on the face of the earth than some of those in the central part of the United States."

It seems that what he really referred to was the "sordid, cheap, dirty, and extravagant" aspects of many of our towns and cities. It was a plea for a more intelligent and wider appreciation of the need for city planning and the rectification of the dire results of hurried and thoughtless greed, that too often has only seen immediate profits and overlooked future depreciation.

Mr. Gilbert has always been known for his cheerful encouragement of the younger men of his profession, and no one is better qualified to express an unprejudiced opinion of our architecture and art.

Our people do indeed need an awakening to the value of a general and local interest in well-ordered cities and towns and in all the arts. No art will be more benefited by such an awakening than that of architecture, an art that is constantly influencing public taste by its very obviousness. He who runs may read, if he will only keep his eyes open.

We venture to say that the Detroit Public Library has been an object-lesson in beauty to thousands, to whom the arts in general may be almost a dead letter.

The Fontainebleau School of Fine Arts

THIS school was dear to the heart of the late Lloyd Warren, and he had given much of his time and thought to furthering its organization and purposes.

The school offers exceptional opportunities to American students, and as Mr. Whitney Warren (who will carry on his brother's work) says in the letter accompanying the circular of information:

"There certainly is no place in France better adapted than Fontainebleau for the study of all styles of architecture, painting, and interior decoration; for at one time or another many of the great French and Italian masters have left their imprint upon this group of buildings."

"The American organization is concerned solely with the recruiting of students. It has been placed, by the French authorities, in the hands of Mr. Whitney Warren for the department of architecture and of Mr. Ernest Peixotto for the department of painting. They, in turn, have organized the committees that will aid them in making the school known in America and in selecting its students. It is hoped that all parts of our country will be represented in the student body, and for this reason the American committee is working in connection with the heads of our leading art schools and colleges. It feels that it is offering a unique opportunity to American students."

An Authoritative Book on Colonial Architecture

ON another page of this number appears a review of Professor Fiske Kimball's notable book on our Colonial architecture from the seventeenth century to the early republic. In the many books that have dealt with the subject, none have heretofore gone so searchingly into original documents and been so careful to verify and authenticate attributed dates. But all this is of course a minor consideration compared with the wealth of new and detailed information regarding the structure and ornamentation of famous buildings. If the architect wants to know the plan and appearance of the interior of Westover, for instance, he will find it here, and if he is in need of accurate and visible information about the types of balusters, stair-ends, panelling, ceilings, and mantels that belong to a certain date, he will find it in this admirable book. It is a mine of information on both exterior and interior features of the most interesting period in the history of our architecture.

The volume is published under the auspices of the Metropolitan Museum of Art, New York.

Prizes for the Best Complete Design of a Lamp-Shade and Base

THE ART ALLIANCE OF AMERICA, at the Art Centre, 65–67 East Fifty-sixth Street, New York City, announces a competition for a lamp-shade and base for prizes offered by the Decorative Arts League.

First prize of $300, second prize of $200, and third prize of $100 are offered for the best complete design of a lamp-shade and base. Three additional prizes of $100 each *may* be awarded by the jury for other meritorious designs. In addition, if the design selected for production proves to be successful for the purpose intended, the Decorative Arts League will award to its maker a further prize of $400.

The object of this competition is to develop a lamp of beauty and utility, which will be harmonious in the average as well as the better homes, and which may be reproduced at a cost within easy reach of the person of average means or income.

Designs should be practically suitable, with minor modifications, for equipment with standard fittings, for electricity, oil, or gas.

A vase form, which the lamp may take, is suggested to illustrate the construction of a lamp which would meet requirements for three different kinds of light.

This form, or a modification thereof, may be used as a basis on which to apply further refinement of detail, ornamentation, color, etc., in building up a finished design to be submitted in the competition.

Competition closes February 15.

The Indiana World War Memorial

WE call the attention of our readers to the notice sent out by the Board of Trustees of the Indiana World War Memorial of a competition for a World War Memorial to be erected in the city of Indianapolis at an approximate cost of $2,000,000. Full information may be obtained by addressing Paul Comstock, Secretary, The Chalfont, Indianapolis, Indiana.

A Correction

IN the January number it was stated under the illustrations of the Franklin Simon & Co. Store Building that Messrs. Necarsulmer & Lehlbach, the architects, were awarded the second prize for alterations by the Fifth Avenue Association. As a matter of fact, they were the winners of the first prize and medal.

San Francisco's Industrial Trade-Schools

IT costs approximately $150 per man to bring in journeyman mechanics from outside points. It costs only approximately $36 per man to train men in the San Francisco Industrial Association's trade-schools.

During the last year and a half, in order to meet immediate and acute shortages of certain building-trades mechanics, the Industrial Association at various times has brought to San Francisco some 200 men, at a cost in round figures of $150 per man. Within the past nine months the association has trained 170 young men in its schools for plasterers and plumbers at a total cost of approximately $36 per man—a saving of $114 per man.

With the training secured in these schools, the student enters his trade as an advanced apprentice, with the guaranty that he will be given the rank and pay of a journeyman at the very earliest moment he can qualify as such. In other words, the old idea of a set term of apprenticeship has been abandoned. As a matter of fact, no time limit at all is fixed. Thus the whole matter of the apprentice's advancement to the rank and pay of a journeyman depends only upon his individual proficiency. Furthermore, local contractors state that the young men trained in the association's schools are already as capable as the average itinerant journeyman; and they are improving, of course, every day.

In addition to the great money-saving effected through training men instead of bringing them in from outside points, the association points out that the men trained are nearly all, if not all, youths who have grown up in the community and thus have community ties and interest which outsiders seldom have. They are now, and are most likely to remain, an integral part of the community; and while primarily they will utilize the training they have received to earn a livelihood, they will be much more liable than outsiders to be interested in the development of their own city.

The Industrial Association regards its trade-schools—which were started as somewhat of an experiment—as a complete success, and is now arranging to open additional ones for other trades.

LOBBY AND STAIRCASE, THE ALLERTON FIFTY-SEVENTH STREET HOUSE, NEW YORK.

Arthur Loomis Harmon, Architect.

THE RECEPTION-ROOM, THE ALLERTON FIFTY-SEVENTH STREET HOUSE, NEW YORK.

Arthur Loomis Harmon, Architect.

LOBBY AND MEZZANINE.

THE PARLORS.

Arthur Loomis Harmon, Architect.

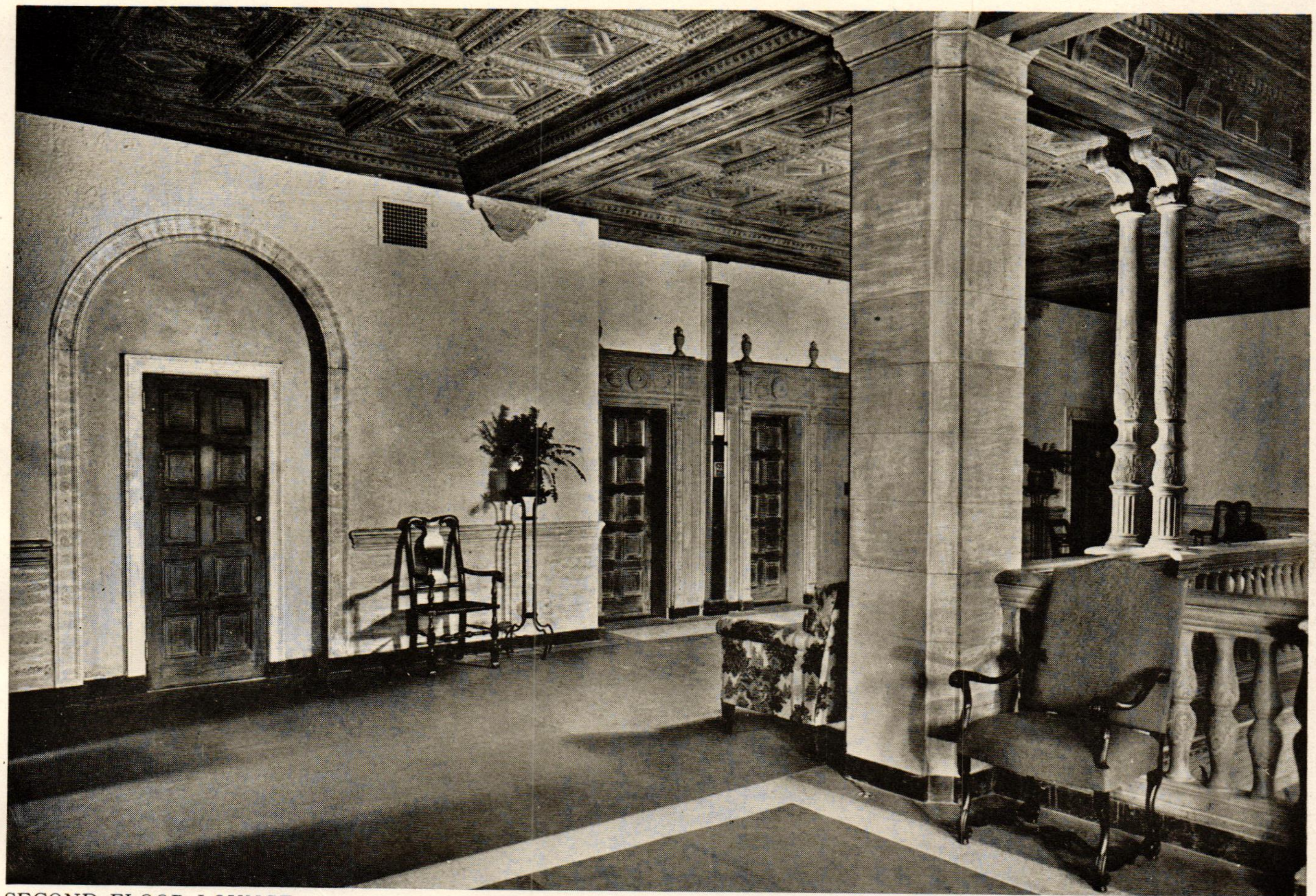
THE ALLERTON FIFTY-SEVENTH STREET HOUSE, NEW YORK.

SECOND-FLOOR LOUNGE.

Arthur Loomis Harmon, Architect.

THE ALLERTON FIFTY-SEVENTH STREET HOUSE, NEW YORK.

SOLARIUM.



SECOND-FLOOR LOUNGE.

Arthur Loomis Harmon, Architect.

THE ALLERTON FIFTY-SEVENTH STREET HOUSE, NEW YORK.

PRIVATE DINING-ROOM, SECOND FLOOR.

DINING-ROOM, FIRST FLOOR.

Arthur Loomis Harmon, Architect.

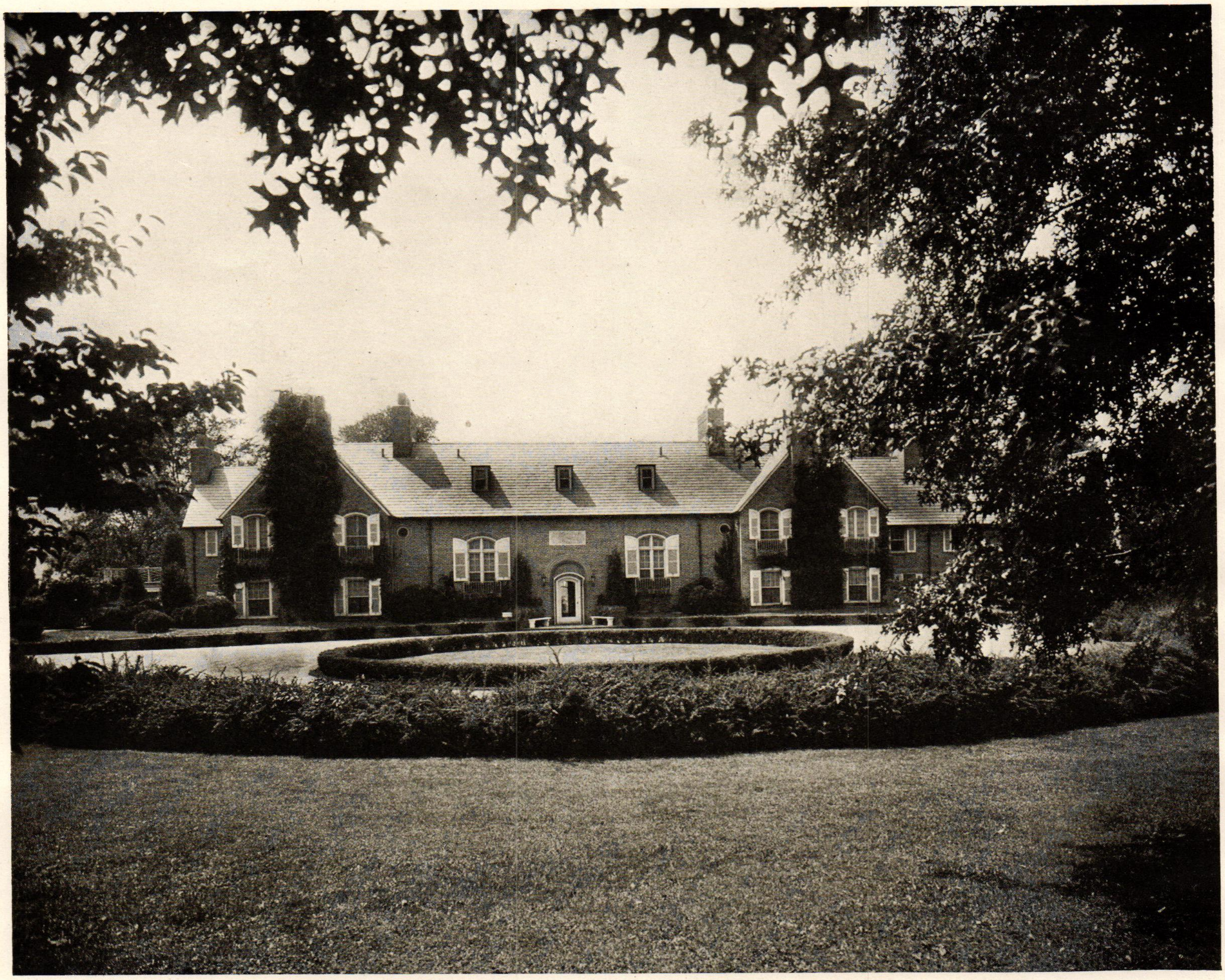
THE ALLERTON FIFTY-SEVENTH STREET HOUSE, NEW YORK.

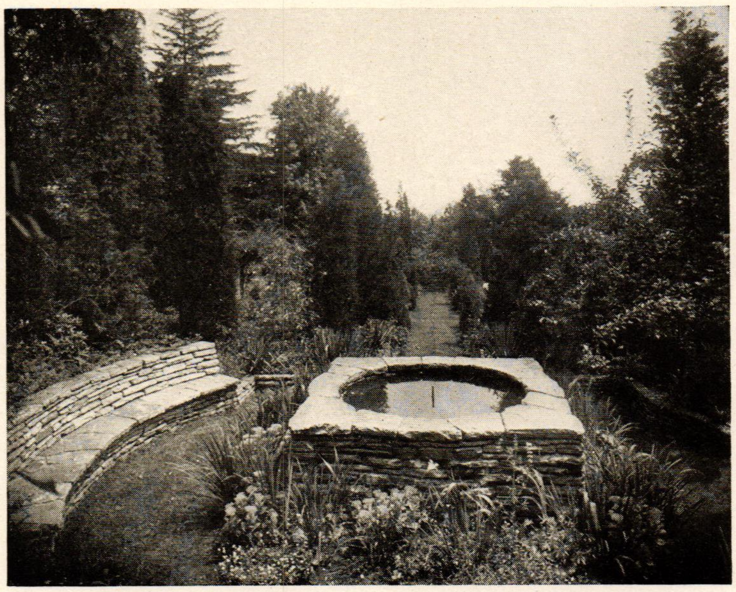
RESIDENCE, H. W. CROFT, GREENWICH, CONN.

Janssen & Abbott, Architects.

RESIDENCE, H. W. CROFT, GREENWICH, CONN.

Janssen & Abbott, Architects.





RESIDENCE, H. W. CROFT, GREENWICH, CONN.

Janssen & Abbott, Architects.

STAIR HALL AND STAIRCASE, RESIDENCE, H. W. CROFT, GREENWICH, CONN. Janssen & Abbott, Architects.

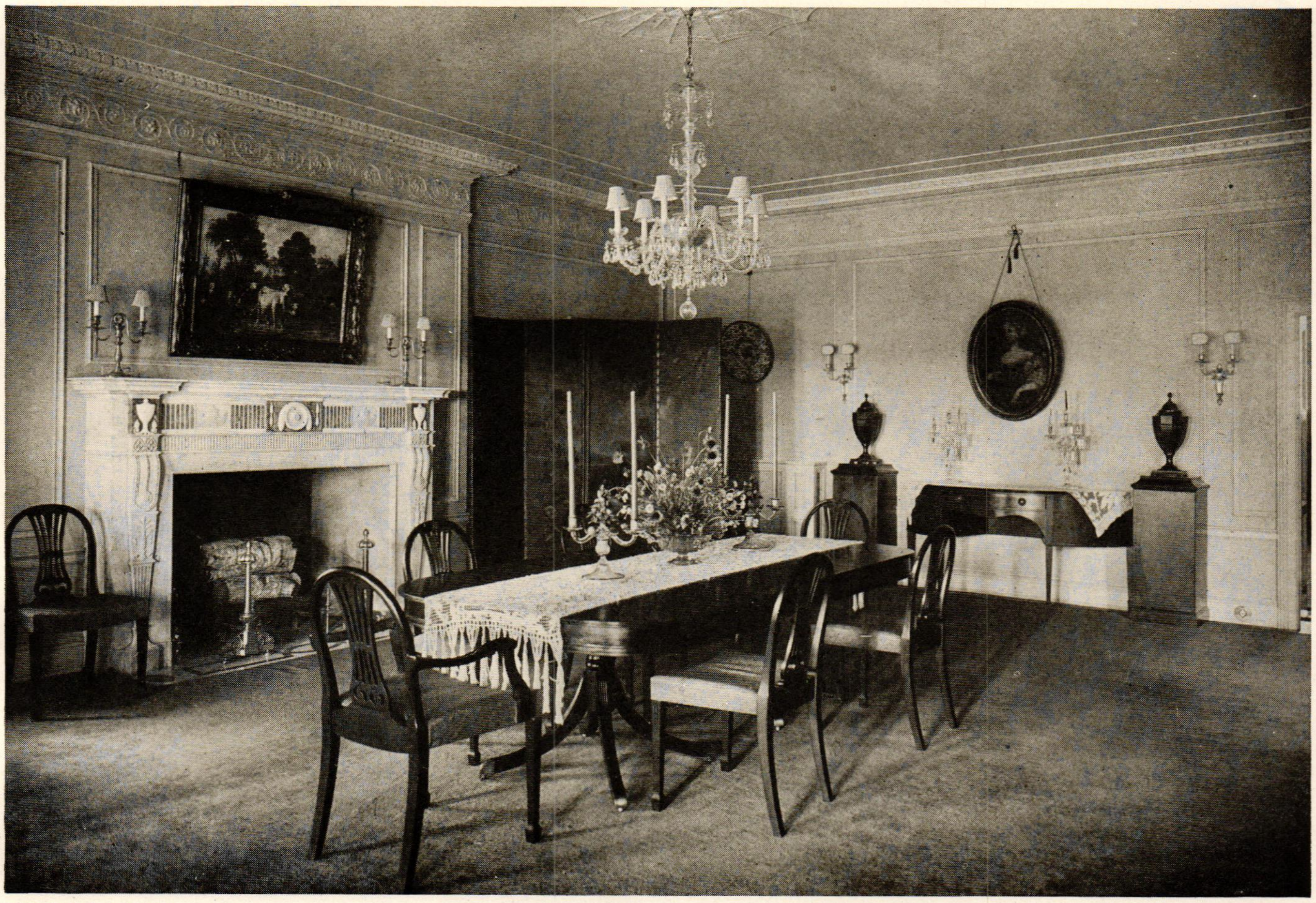
VIEW FROM ENTRANCE HALL TO STAIR HALL.

STUDY.

Janssen & Abbott, Architects.

RESIDENCE, H. W. CROFT, GREENWICH, CONN.

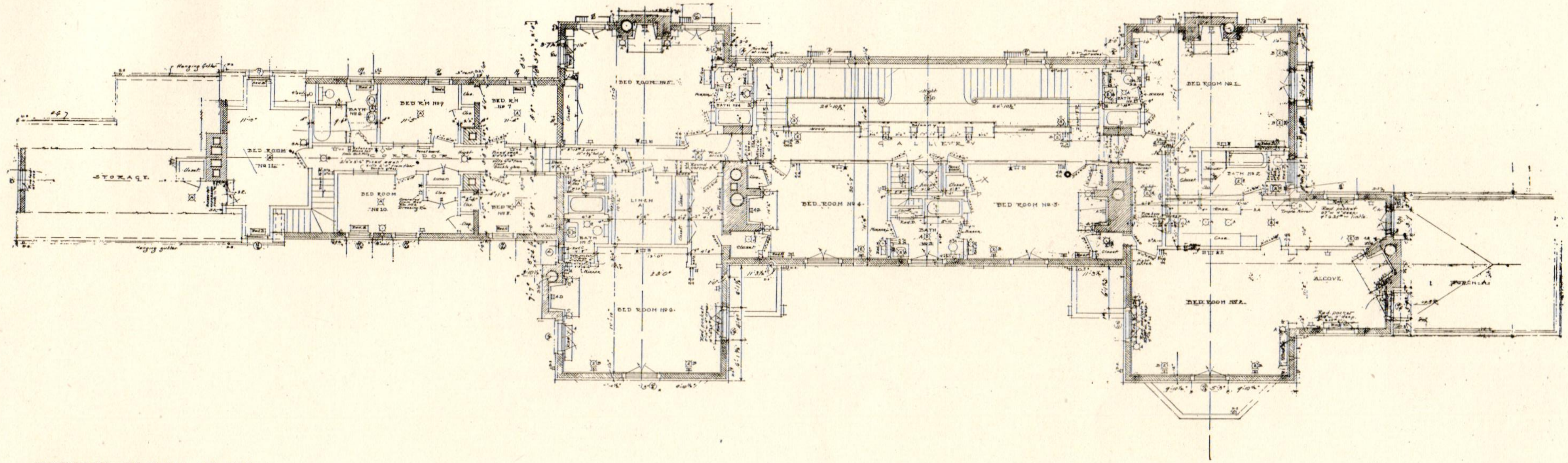
LIVING-ROOM AND ALCOVE.



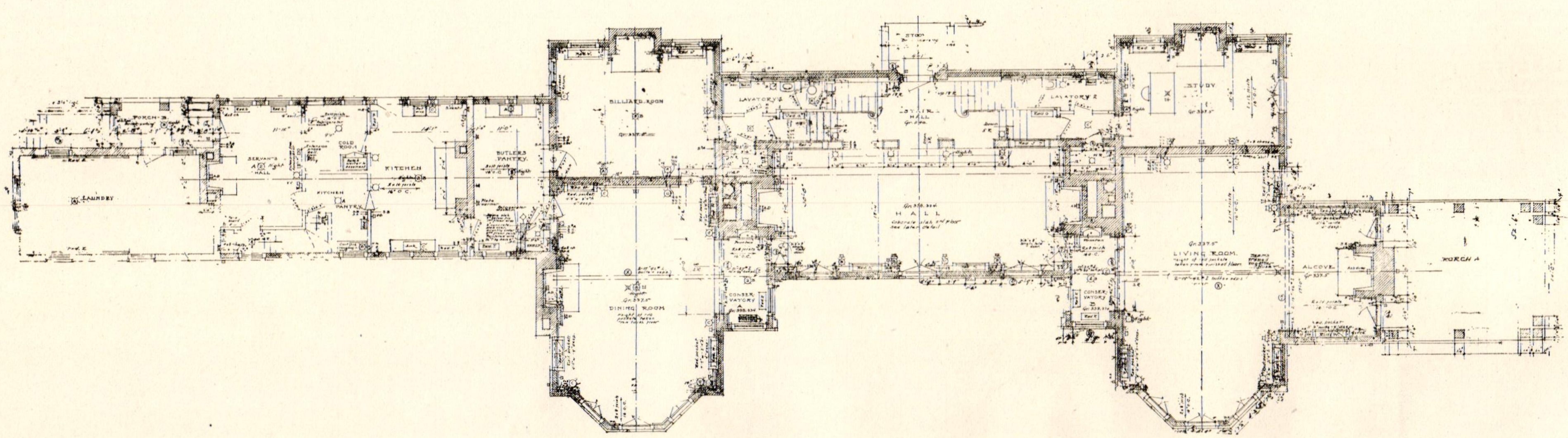
DINING-ROOM.

Janssen & Abbott, Architects.

RESIDENCE, H. W. CROFT, GREENWICH, CONN.



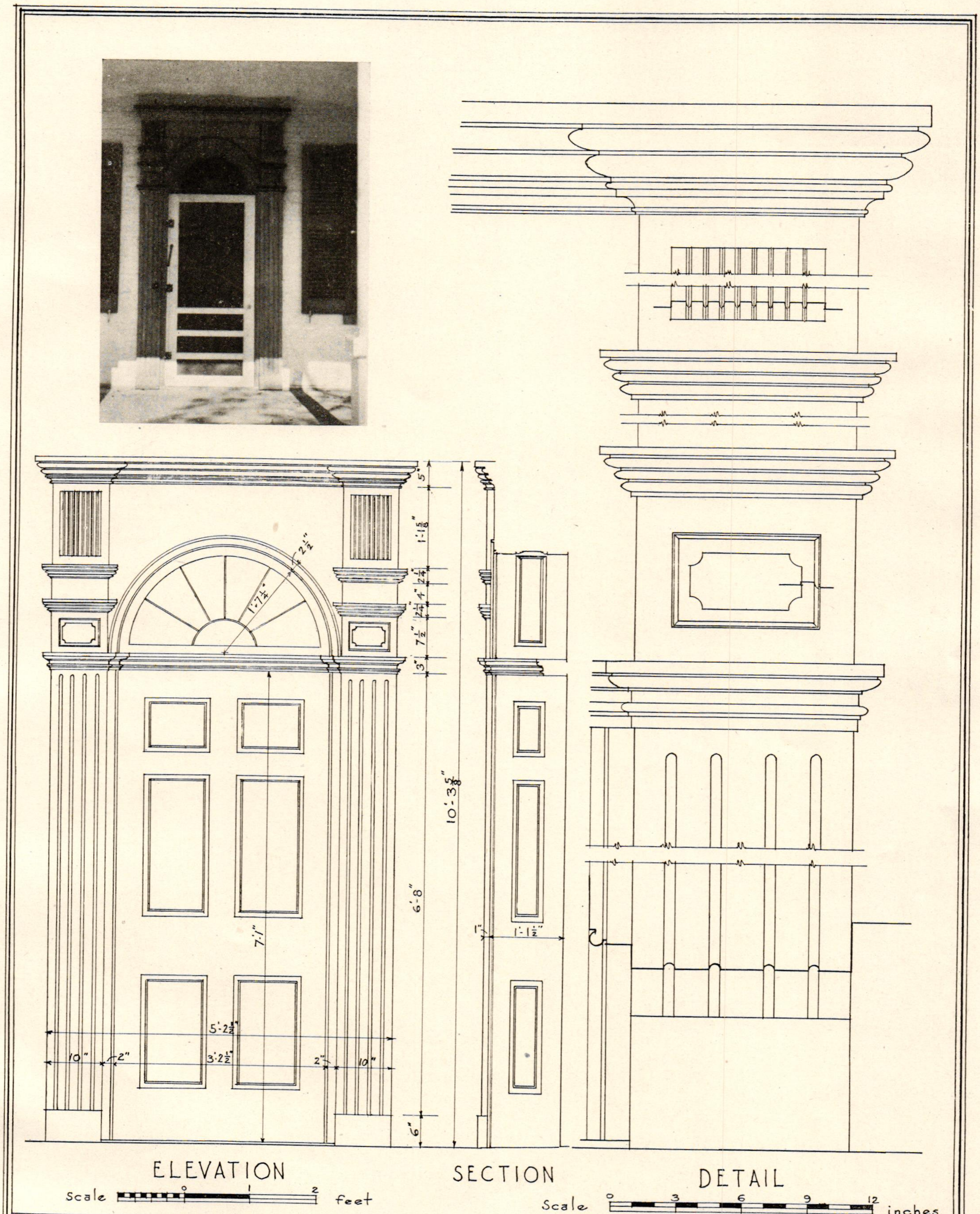
SECOND-FLOOR PLAN.



FIRST-FLOOR PLAN.

Janssen & Abbott, Architects.

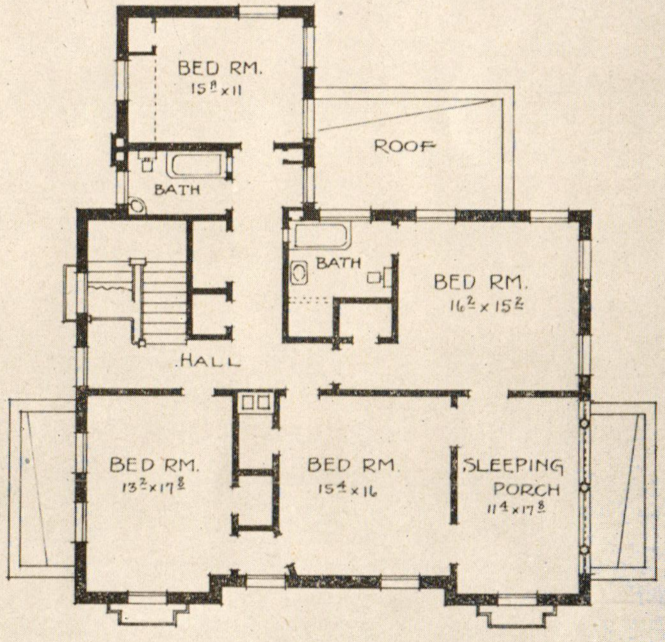
RESIDENCE, H. W. CROFT, GREENWICH, CONN.



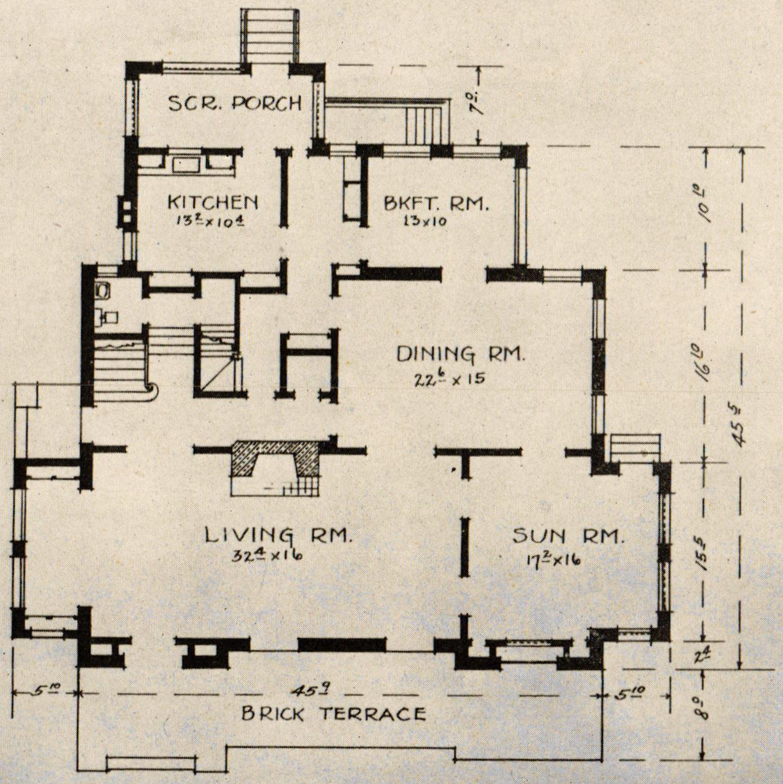
EARLY ARCHITECTURE OF THE DISTRICT OF COLUMBIA	· DOORWAY · THE MAPLES · · SOUTH CAROLINA AVE., 6th & 7th STS., S.E. · BUILT BY WILLIAM DUNCANSON IN 1794 ·	MEASURED AND DRAWN BY ALBERT P ERB

RESIDENCE, DR. G. P. ROBERTSON, SAN ANTONIO, TEXAS.

Atlee B. Ayres & Robert M. Ayres, Architects.



SECOND FLOOR



FIRST FLOOR

RESIDENCE OF

Dr. G. P. Robertson SUMMITT AVE.

Atlee B. Ayres & Robt. M. Ayres, Archts.

SAN ANTONIO, TEX.

The New Gymnasium for the University of Virginia

John Kevan Peebles, Walter D. Blair, R. E. Lee Taylor, Fiske Kimball, and W. A. Lambeth, Architectural Commission

By Fiske Kimball, Supervising Architect

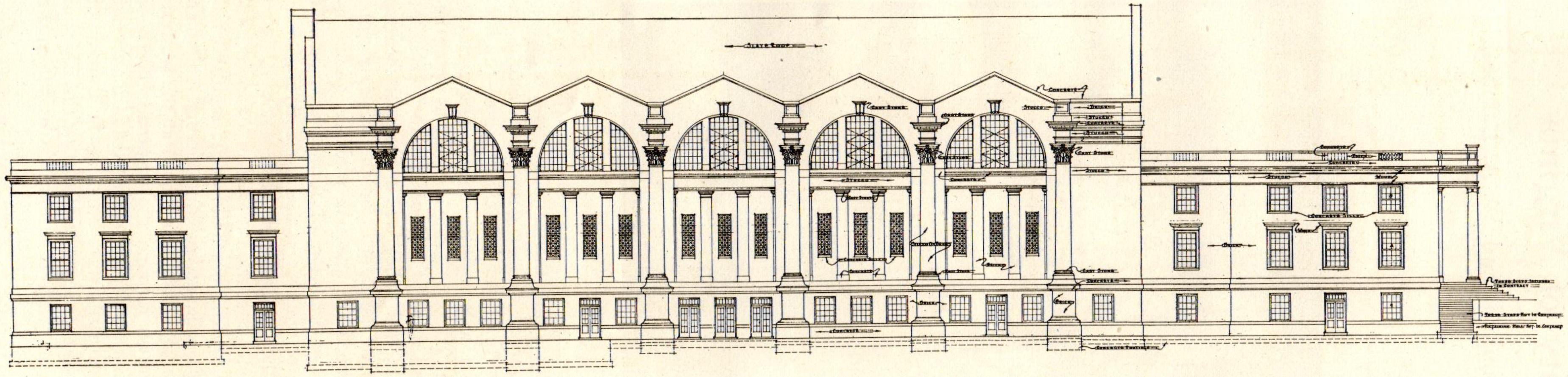
Author of "Domestic Architecture of the American Colonies and of the Early Republic"

WITH the project of its new gymnasium now under construction, the University of Virginia initiated the largest building programme since its restoration after the fire of 1896. It was necessary to go outside of the main university group for a location, and thus to consider the general question of future development of the group plan. Accordingly, an architectural commission was appointed, consisting of four architects (three of them alumni)—Messrs. John Kevan Peebles, '90, Walter D. Blair, '96, R. E. Lee Taylor, '01, and Fiske Kimball, head of the school of architecture—with Doctor William A. Lambeth, superintendent of grounds and buildings, to make general recommendations regarding architectural development and to act in an advisory capacity in the design of the gymnasium.

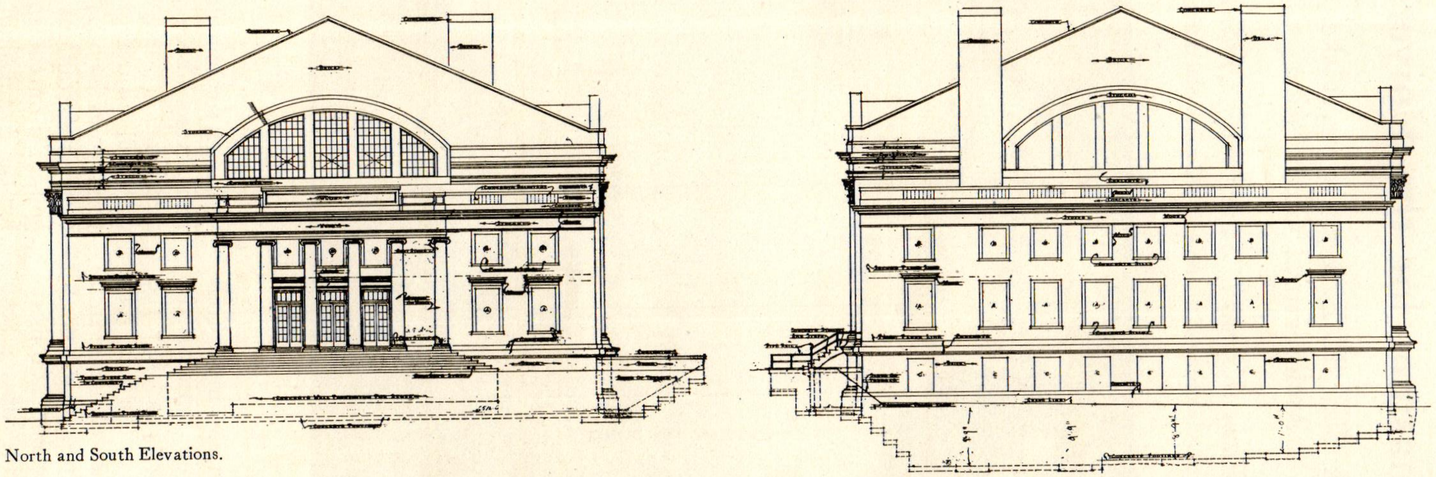
The problem of location and growth confronting the commission was briefly this. The old formal group by Jefferson, with its extension southward by McKim, Mead & White—recognized as perhaps the finest ensemble in America—occupies a narrow plateau already nearly covered with buildings. The lower slope and plain on the east is allotted to the expansion of the university hospital and medical group there located. On the north Madison Hall closes the main axis, and its small private grounds would in any event give but limited opportunity for expansion there. There remained for consideration only the valley on the west, which had scarcely been regarded as a field for architectural expansion. A pond with irregular borders occupied the bottom and an overgrown hillside intervened. The architectural commission pointed out, however, that as lying between the stadium and athletic field on the north and the golf-links on the south, this valley was the proper location for the gymnasium, with dormitories on the westerly slope near by. There remained the question whether, on the irregular topography, the tradition of formal arrangement should be abandoned, or whether some formal arrangement and connection with the old group could be devised.

In the scheme under execution it is such a formal relation which has been adopted, foreshadowing a regular composition of great magnitude and unique among American academic groups. The gymnasium is placed at the western end of a cross-axis drawn through the esplanade north of the rotunda. The marshy valley is transformed into a formal lagoon, about which will rise future buildings in a grouping not dissimilar to that of the Court of Honor at the Chicago Exposition. An *allée* and ramps lead down the axis from the university.

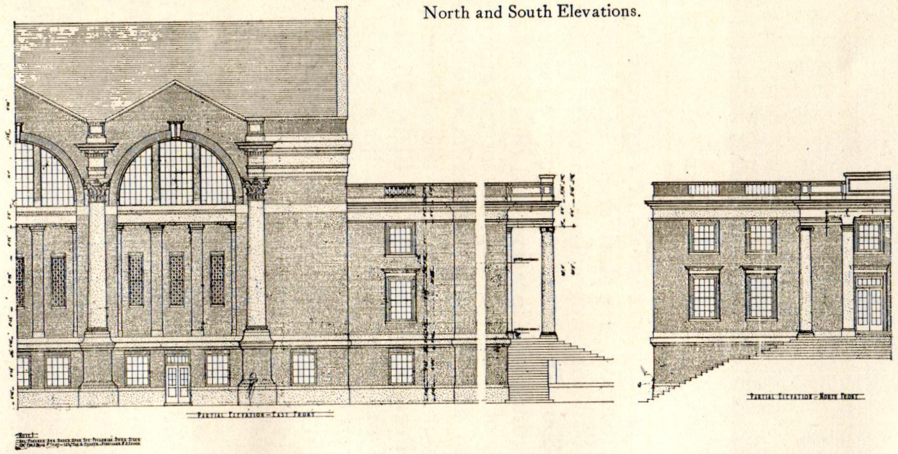
In the gymnasium building itself it was desired to secure very perfect adaptation to detailed athletic requirements,



East Elevation.



North and South Elevations.

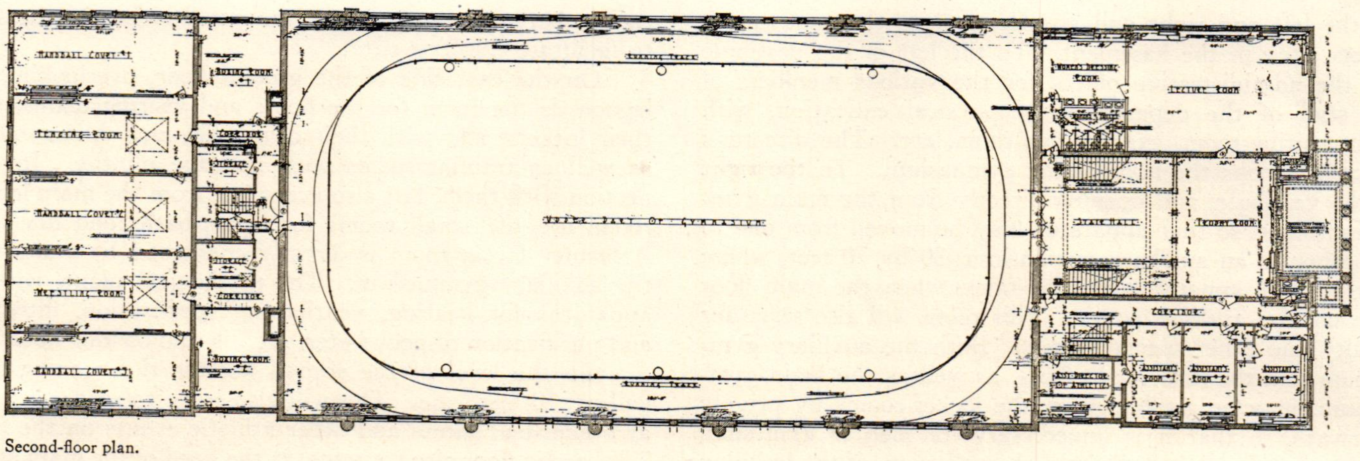


Detail of East Elevation.

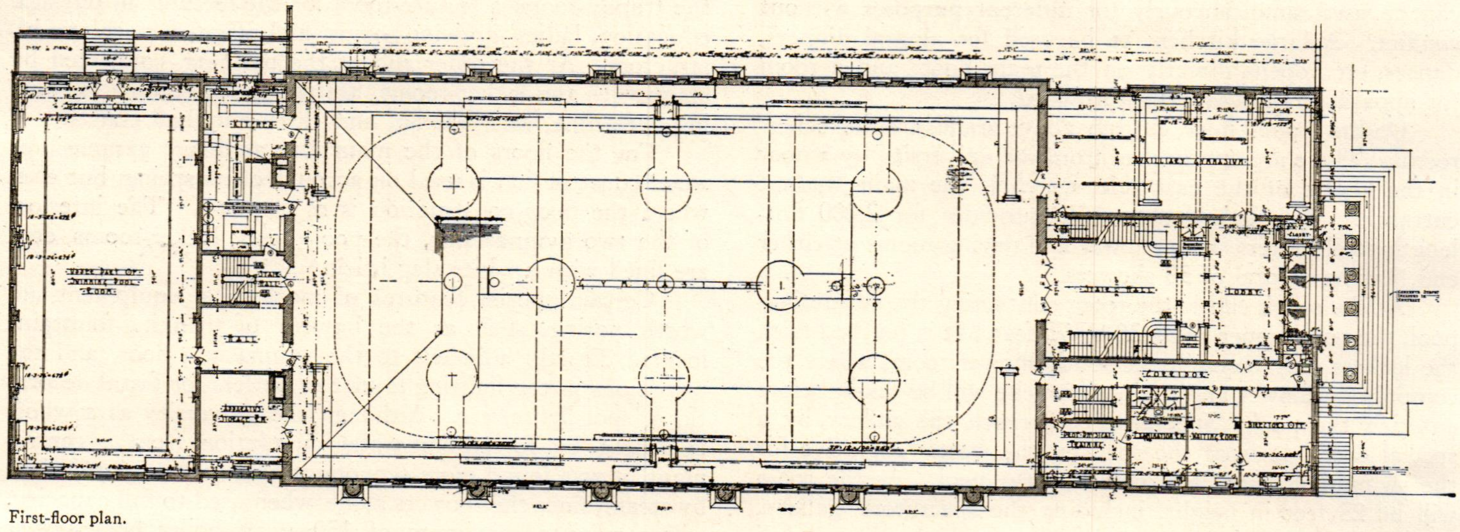
The exterior is designed to harmonize with the classic and monumental traditions of the university. The problem, on the long façade toward the main group, was to express the character of the great interior without dwarfing the older buildings with their relatively small actual scale. A solution was found in the use of the Roman-bath motive, with five arches and gabled bays flanked by Corinthian columns bearing a fragment of entablature. In this way it was possible to keep the columns from exceeding in height those of Jefferson's rotunda, the focal building of the whole group. As the rotunda also occupies the highest ground, it is still left dominant, as it should be. The north end, with its entrance toward the main public road, has a portico of six Ionic columns, on the scale of those of Jefferson's "pavilions." Brick walls with stuccoed columns continue the invariable local tradition.

THE NEW GYMNASIUM FOR THE UNIVERSITY OF VIRGINIA.

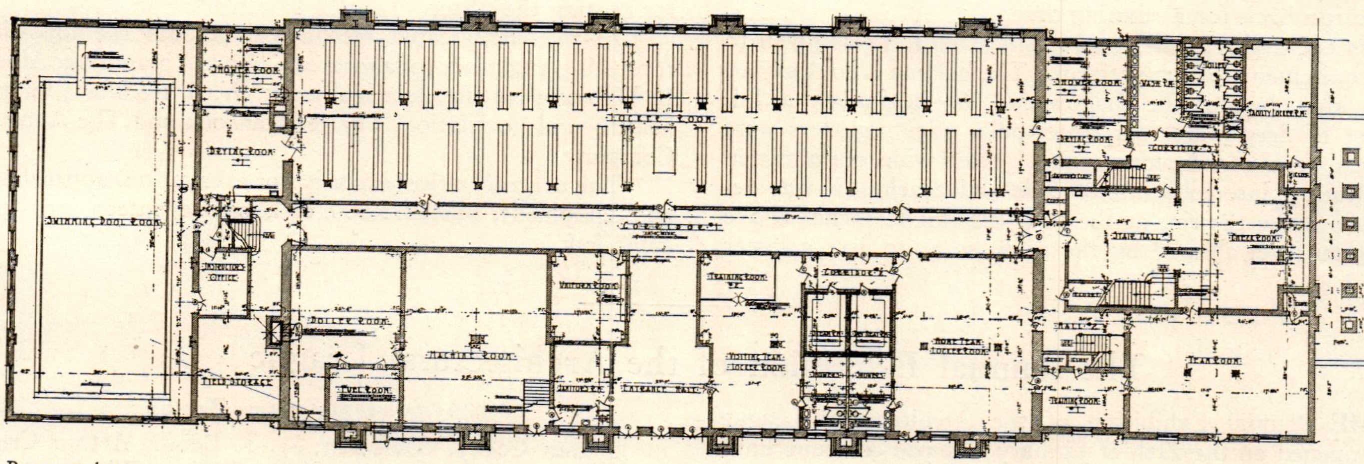
John Kevan Peebles, Walter D. Blair, R. E. Lee Taylor, Fiske Kimball, and W. A. Lambeth, Architectural Commission; Fiske Kimball, Supervising Architect.



Second-floor plan.



First-floor plan.



Basement plan.

without sacrificing the classic and monumental character demanded by the existing buildings of the university.

The Southern climate rendered an "indoor field" for baseball and football practice unnecessary, so that the size of the main gymnasium floor could be determined by basket-ball and track requirements. This meant an exact multiple of four laps for the running-track, and breadth enough to place full-size practice courts for basket-ball crossways of the floor. With a twelve-lap track three such practice courts are possible, and this was the scheme selected. The final proportions of the floor, 96 feet by 180 feet, as compared with Princeton's 101 feet by 160 feet, were adopted to give a longer straightaway for the dashes. The standard height for suspended apparatus, 21 feet 10 inches, used for the truss-chord at Princeton and West Point, was regarded as inadequate for interior architectural effect on so wide a span, and a clear height of 35 feet at the centre was established. A skylight was also considered undesirable, so that very ample side lighting has been secured by the exterior motive adopted.

On the narrow site available it was found best to place the locker-rooms under the main gymnasium in an architectural basement, which, however, is wholly above ground. Only at the north a broad terrace with carriage approach rises nearly to the level of the main story.

The main entrance, for spectators and the public, faces this north terrace, and is sheltered by a portico. This leads into a vestibule, beyond which stairs ascend to the gallery on the left and right and also descend to the coat-rooms, toilets, etc., in the basement. To the left of the vestibule are the administrative offices for the various members of the staff of the department of physical education, with their waiting-room, examination-room, etc. The director's office overlooks the floor of the gymnasium. To the right of the vestibule, and opening directly from the main gymnasium floor, so that apparatus may be moved from one to the other, is an auxiliary gymnasium, 30 by 70 feet, where exercise with apparatus may be taken when the main floor is in use for athletic games. This room will also serve for faculty and other special classes. Both the auxiliary gymnasium and the directors' offices, as well as the main gymnasium, may be reached from the locker-rooms by private stairways, so that it is unnecessary for men in gym suits to traverse the main halls, and thus all parts of the building can be used simultaneously for different purposes without conflict. A large kitchen, to be used for alumni dinners, dances, etc., opens directly on the main floor; and a room for apparatus storage is also provided.

On the ground floor, entirely above grade, are the locker-rooms. These are approached from the university by a door in the centre of the east side, which is the main student entrance. The main locker-room provides for 2,000 full-length steel lockers, with shower and drying-rooms at either end, having a total of 50 showers.

At the south end is the room containing the swimming-pool, the pool proper being 30 by 75 feet. It is reached from the lockers only through the south shower-room, where the compulsory shower and perineal douche will be taken before entering the pool. Spectators will reach the gallery by a special entrance from the road on the west. An office for the swimming instructor overlooks the pool. As the room will be 23 feet in height, including the spectators' gallery, there will be ample opportunity for the high dive as well as the run-back for a running dive.

In the design of the pool much attention was given to the requirements of competition. The bottom is so designed as to give, besides the shallow end for beginners, a full 60 feet of deep water for water-polo. Scum-gutters were omitted at the ends for racing. After wide consultation with leading intercollegiate officials and coaches, it was decided to make the rim at the ends the full 18 inches above the water-level allowed by the rules, so as to give a faster racing start, but to cut down the rim 8 inches on the sides to facilitate climbing out.

On the east side of the ground floor, overlooking the lagoon, is the room for the home and visiting teams, with their lockers, and with their own toilet and shower-rooms, as well as training-rooms with massage plinths. In connection with them, but also accessible from the main locker-room, are the small rooms for steam-baths and dry heat. A faculty locker-room is directly connected by stairs with the auxiliary gymnasium. The mechanical plant, with its apparatus for heating, ventilation, sterilization, filtration, and purification of pool water, etc., is also on this floor.

On the level of the second floor is the running-track gallery, 10 feet wide. This will also serve to seat spectators at basket-ball games and other athletic events on the floor. The second floor also contains, at the head of the main stairs, the trophy-room, a lecture-room for the lectures in physical education, ladies' dressing-rooms, and offices for athletic instructors. At the other end of the building, connected by stairs with the locker-rooms, are the special rooms for boxing, wrestling, and fencing, and three handball courts.

For the floors of the main and auxiliary gymnasiums wood construction is used on account of its spring, but elsewhere the floor construction is of concrete. The interiors of the two gymnasiums, the pool-rooms, locker-rooms, etc., are lined with a white slag brick.

Certain special features of mechanical equipment are worth noting, such as the battery of drinking-fountains located directly adjacent to the gymnasium floor, and the provisions in the lighting layout of outlets for festal decorations, spot-lights, etc. Although the university as a whole is heated by forced hot-water circulation from a central plant, it was found more economical to heat the gymnasium by steam, since the showers alone, when used to full capacity, will require a maximum of 150 steam-boiler horse-power for heating the water.

In the complicated mechanical layouts the following consulting engineers collaborated: For the plumbing, Albert L. Webster; for the electrical work, W. S. Rodman; for the heating and ventilation, Charles Hancock and The Almirall Company.

The contract price, exclusive of excavation, approaches, and equipment, was $275,000, or about seventeen cents per cubic foot.

The Annual Exhibition of the Architectural League

THE Annual Exhibition of the Architectural League opened on the 27th of January and will continue until February 24.

Committee on the Exhibition and Jury of Selection

Howard Greenley, President; Russell F. Whitehead, Secretary; Leon V. Solon, Treasurer. Arthur Covey, Horace Moran, Edward McCartan, Ferruccio Vitale, Vice-Presidents.

Committee on Annual Exhibition

Ely Jacques Kahn, Chairman; Robert Aitken, D. Putnam Brinley, Arthur Covey, Arthur Crisp, Otto W. Heinigke, J. Monroe Hewlett, Birch Burdette Long, H. Van Buren Magonigle, Horace Moran, Edward McCartan, Ernest F. Tyler, Ferruccio Vitale.

Committee on Architecture

Ely Jacques Kahn, Chairman; Wm. Adams Delano, Leon N. Gillette, Calvin Kiessling, H. Van Buren Magonigle, Charles A. Platt.

Committee on Decorative Painting

Arthur Covey, Chairman; W. T. Benda, Arthur Crisp, J. Monroe Hewlett, Fred Dana Marsh, Ezra Winter.

Committee on Sculpture

Edward McCartan, Chairman; Herbert Adams, Robert Aitken, Leo Lentelli, H. A. MacNeil, A. A. Weinman.

Committee on Landscape Architecture

Ferruccio Vitale, Chairman; Harold A. Caparn, James L. Greenleaf.

Committee on Crafts

Horace Moran, Chairman; John P. Adams, Lorentz Kleiser.

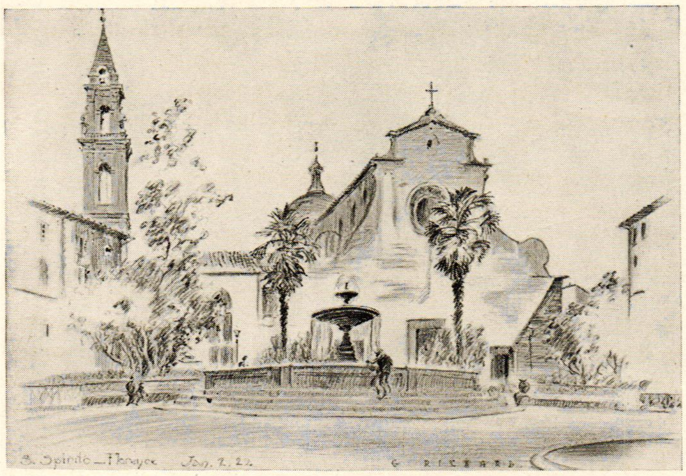
Committee on Catalogue

Alfred C. Bossom, Chairman; Kenneth S. Carr, Gerald A. Holmes, Raymond M. Hood, John M. Montfort, W. Whitehill.

The Value of Pencil Sketching to the Architect

By Greville Rickard

DURING a recent trip through Europe I often had occasion to discuss with architects I met along the way, who, like myself, were travelling for the purpose of architectural observation and study, the question as to the value to the architect of sketching and the amount of time that



Piazza S. Spirito, Florence.

could be profitably given to it without interfering too much with his getting around and seeing things.

There were a variety of opinions expressed. Many were keenly for it, while others had concluded that it involved too much valuable time which could be spent to better advantage in straight sightseeing. Regardless of arguments advanced for or against, it usually seemed to depend on the man's own natural bent. If he enjoyed sketching, had that desire to carry impressions away with him on paper, he sketched and found a good excuse for it. If his bent was along other lines and sketching became a laborious effort, taking much valuable time, he gave it up, and found a good excuse for not doing it.

As for myself, it not only became an absorbing hobby, but as time went on I found and have continued to find that the practice of sketching has the following distinct benefits in developing the architect.

In acquiring a greater facility in the use of the pencil. A ready and easy use of the pencil should make the architect a more capable designer, as he can the more easily translate his ideas onto paper. A responsive medium it is, that most generally used by the architect, becoming, in fact, almost a necessary part of his talking apparatus. He should be able to quickly and freely suggest his thoughts on paper through the sensitiveness of his hand backed by a confidence that he can produce the desired result. Nothing will do this as the practice of sketching.

Whether or not his style is borrowed from another, the sketcher soon develops his own, and gains a greater sense of freedom as time goes on. To sketch tellingly he must be bold, sure, and confident. He must tell his story with the minimum of labor, which means concentrating the interest to certain portions of the drawing and eliminating whatever is unnecessary. This cultivates directness, the ability to arrive quickly at important features of an idea without getting into too much detail.

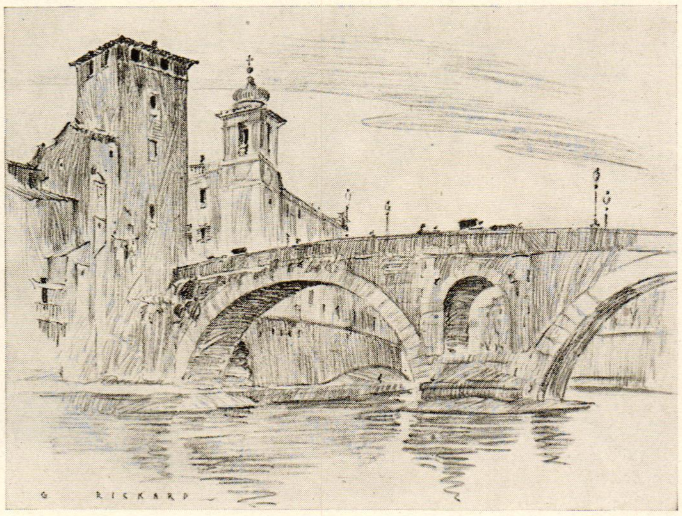
There is nothing like sketching, whatever the subject, to develop in the eye a sense of correct proportion and balance. One learns to see more exactly. He also forms the habit of drawing with the eye, even when not working with the pencil. He runs his eye over the façade of a building and goes through the same mental process as if he were sketching it.

Sketching greatly aids one to analyze the building he draws, as to its general structure, composition, masses, subdivisions, etc., for if one constructs his sketch in a logical way, he is forced into analyzing the building, tower, bridge, or whatever he may be drawing. He finds himself saying, "Now I notice this mass is about two-thirds the width of that mass and about half the height; there are four divisions, each with a grouping of three windows; the tower at the right goes a little higher than that to the left," and so on.

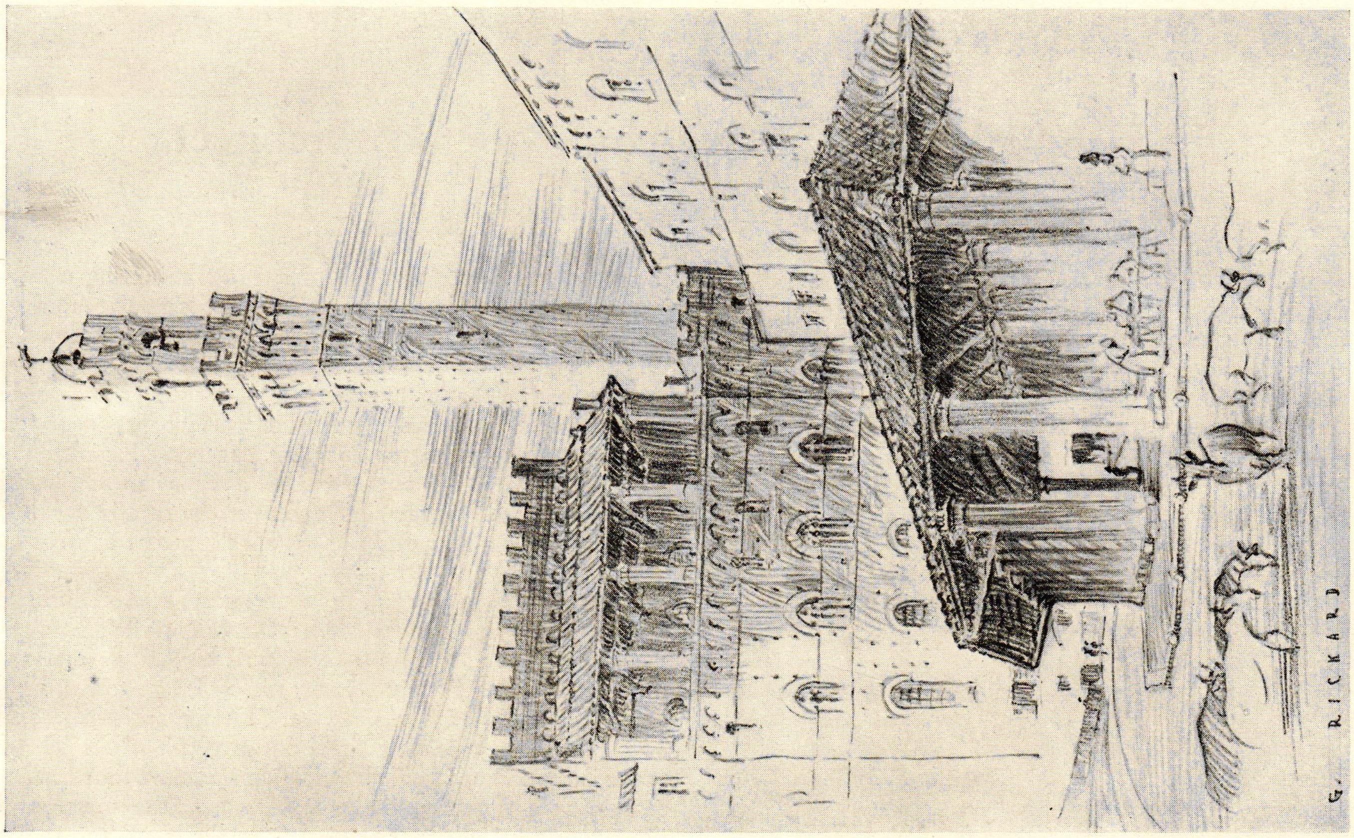
There is no surer way of impressing an object upon one's memory than by making a sketch of it. More than once have I come back to sketch a building which I was sure I had already thoroughly taken in with the eye, and surprised myself at the number of things which came to my notice while drawing that had previously escaped me or made no particular impression. As I look back over places visited those buildings stand out most clearly in my memory which I took the time to sketch.

Sketching any object brings into play the fundamental principles of perspective. One learns to feel into the third dimension and around the corners, and in time develops the ability to correctly visualize an object. He sees a thing as it exists in reality and not as one so seldom sees it in straight elevation. This is a faculty the architectural designer should develop. Our architecture has so many mere façades,

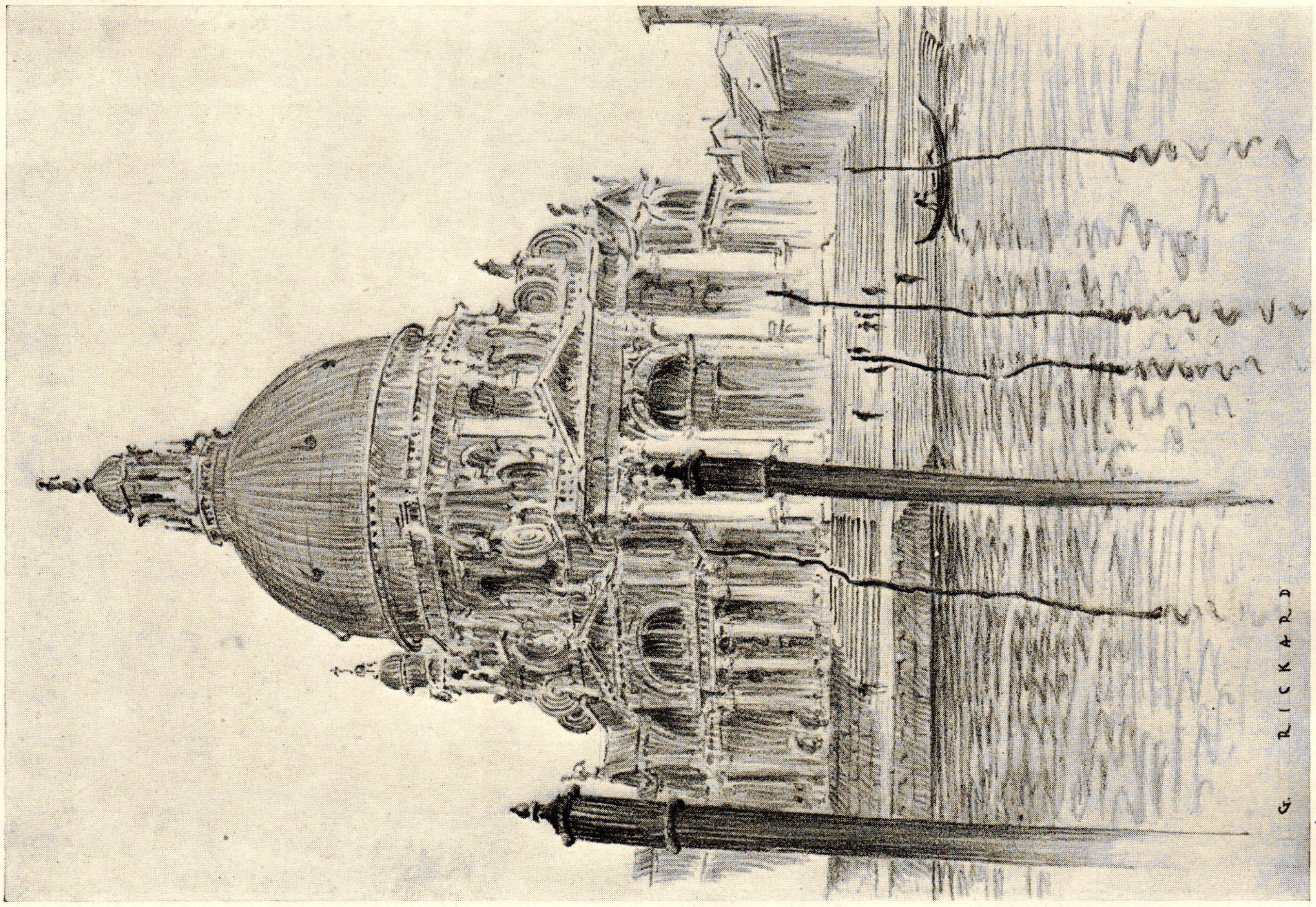
(*Continued on page* 56)



Ponte Fabricio, Rome.



PIAZZA DEL MERCATO, SIENA.



SANTA MARIA DELLA SALUTE, VENICE.

From the drawing by Greville Rickard.

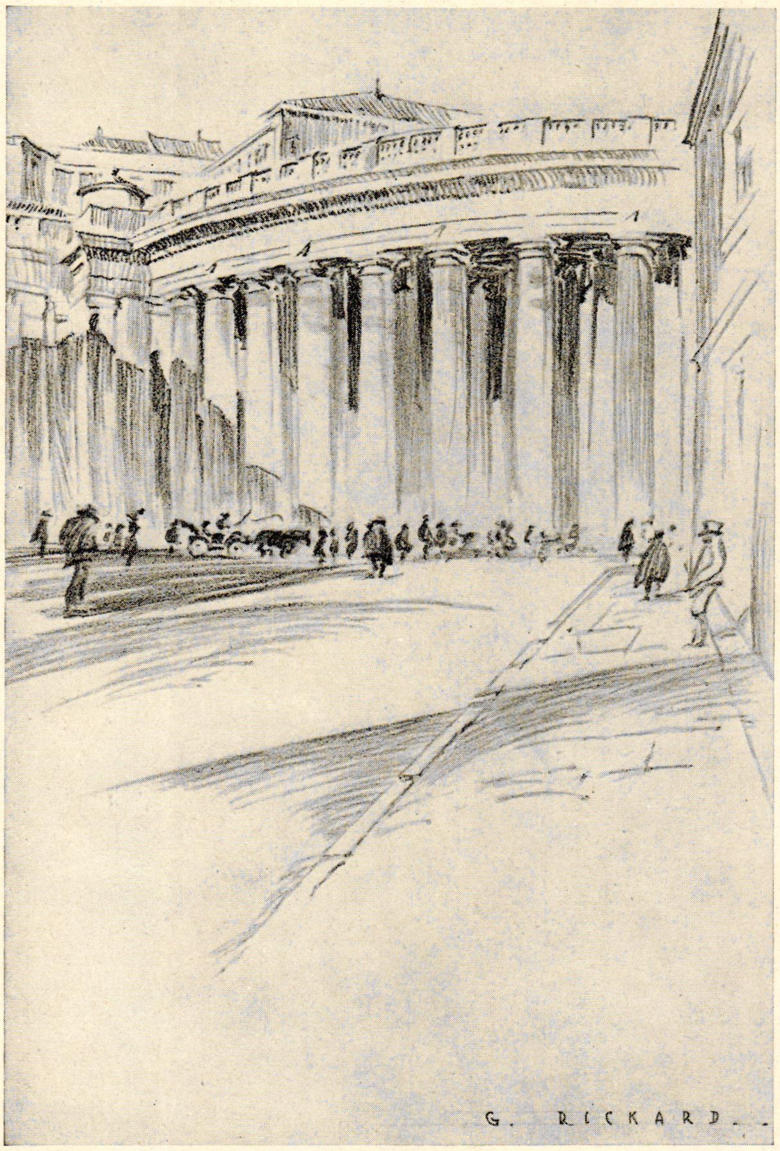
ANTWERP CATHEDRAL.

(*Continued from page* 53)

which one can almost see laid out in straight elevation on a drawing-board, not sufficient attention being paid to reveals, side-walls, and silhouettes. A high building, for instance, will often have a beautifully detailed cornice facing too narrow canyon streets, from where it cannot be seen to good advantage, while the bare, jagged silhouette of the rear will look out over some square or park, from where the building is most conspicuous and from where it is most generally seen by the greatest number of people. Better results might be obtained if there were more actual designing done in perspective.

In connection with this should be considered the effect of foreshortening, which sketching makes one appreciate. The fact, for instance, that a dome or tower set back on a building is going to partly disappear from view when seen from the street, or that a roof line which on an elevation drawing may give a pleasing silhouette may in reality be greatly or entirely lost to view.

A sense of scale is developed by sketching, and the importance of this point cannot be too greatly emphasized, as an appreciation of scale is so often neglected. The modern tendency in façades, possibly in its reaction against the coarseness of detail, perpetrated in previous years, has gone, perhaps, too far in the direction of fineness to the point of finicalness. There is too much "paper architecture" to-day. Much of the detail one sees on a modern building, up in the high places, or tries to see, is so obviously the work of sophisticated men, skilled in turning out beautiful detail on paper, but not trained in visualizing the thing as it stands at a distance high up there in the air.



Colonnade from outside the Piazza di San Pietro, Rome.

The habit of sketching in the open cannot help but correct this weakness. One cannot make an interesting sketch of a façade unless he merely indicates or suggests the detail, for as soon as he draws it all in, his sketch ceases to be a good one. It loses interest. He can only successfully indicate that which will tell at a distance. In a band of ornament, for example, or in the breaks of a chéneau or in a row of brackets or machicolations he suggests a certain rhythm that is pleasing. If this is drawn too finely, the rhythm is lost. The wave-lengths are not big enough to carry sufficiently. Very often the scale and sense of rhythm in the original sketch of a façade is much more pleasing than the finished result, simply because during the operation of studying and detailing the architect has allowed himself to get too tight, and a natural tendency has made him get into too fine detail, without comparing back often enough to his original, which has been a spontaneous expression.

Other matters our attention is called to in sketching are those of material, texture, values of light and shade, color, the setting of a building, its relation to its surroundings, or to the landscape in general. In addition to these more practical benefits derived from a habit of sketching, I have found it to be a refreshing relief at times from the continued monotony of just looking at things while sightseeing, by alternating it with the other. Also that it is a great source of stimulation to the imagination, and this is an important point. One's mentality often needs loosening up, especially if he has been handling a triangle and T-square for several years. He needs to attain a greater sense of freedom, to see things in a bigger sense, to feel the masses, environment, and atmosphere to grasp the big reason behind the thing he studies.

Book Reviews

(*Continued from page* 64)

DISTINGUISHED AMERICAN ARTISTS. Frederick A. Stokes Co., New York.

We have received the first two volumes of this series of little books that are to deal briefly with the life and work of the leading artists of to-day.

Child Hassam and Robert Henri, compiled by Nathaniel Pousette-Dart, are the first two artists considered.

There are brief sketches of the painters and a number of excellent reproductions of their best-known pictures.

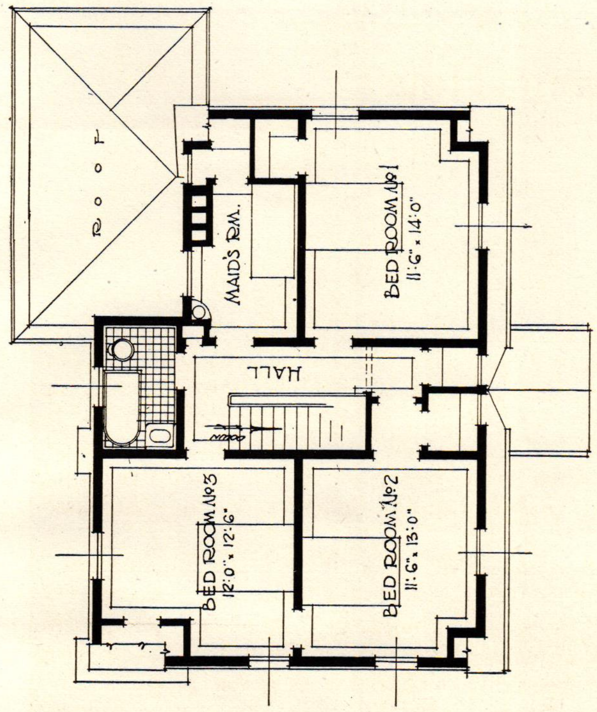
They are attractive little books and should be of interest to all who follow and take pride in the high place that American art holds in the world to-day.

OVER THE DRAWING-BOARD—A DRAFTSMAN'S HAND-BOOK. By BEN J. LUBSCHEZ, F.A.I.A.

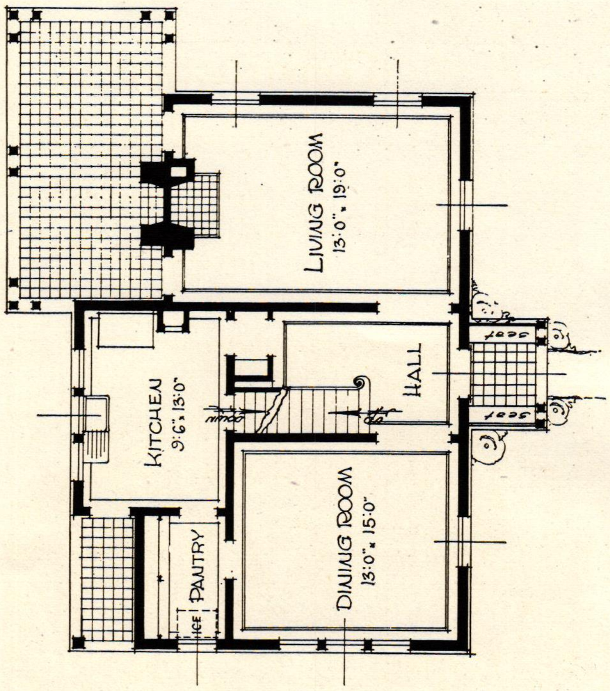
An admirable book of practical service to all draftsmen.—Published by the *Journal of the American Institute of Architects*, Washington.

HOUSE, SHELDON S. YATES, ENGLEWOOD, N. J.

R. C. Hunter & Bro., Architects.



SECOND FLOOR PLAN



FIRST FLOOR PLAN

R. C. Hunter & Bro., Architects.

ENTRANCE DETAIL.

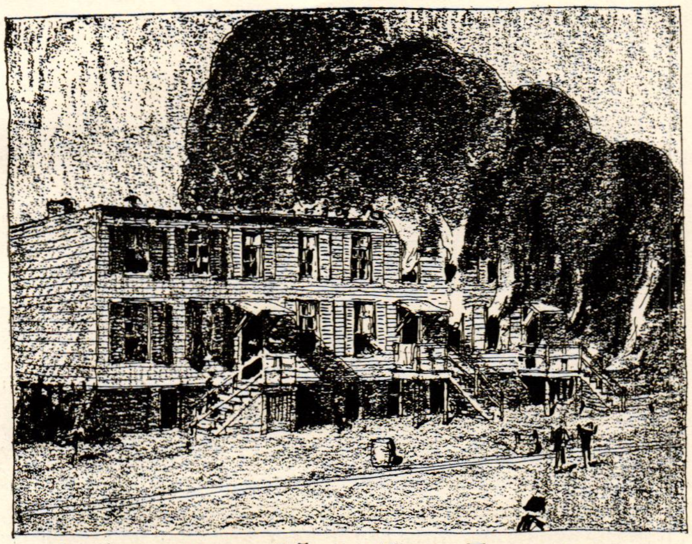
SHELDON S. YATES, ENGLEWOOD, N. J.

Construction of the Apartment-House

By H. Vandervoort Walsh
Instructor, School of Architecture, Columbia University

ARTICLE II

Ordinary Construction



Spreading Fire in Wooden Frame Tenements
Fig 1

What It Is in General

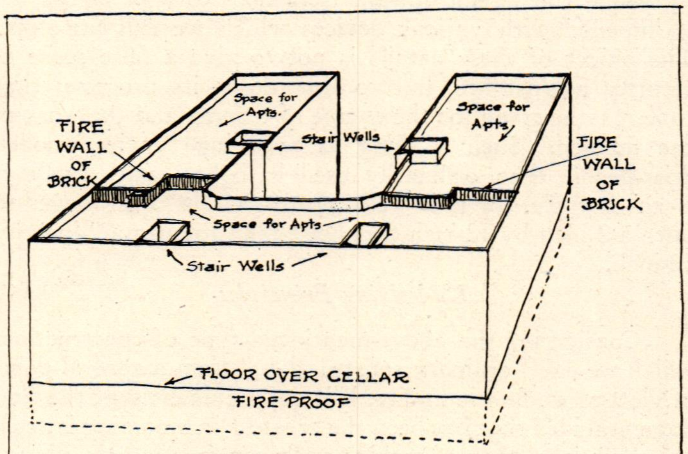
WHERE wooden-frame dwellings are built close together in large cities, they threaten the community with their proclivity to conflagrations. Nearly all American cities that have grown from small towns of wooden houses to important cities have found out by sad experience the terrible possibilities of fires which are stored up within these dwellings, as the seeds of explosions are packed within the stick of dynamite. If we consider the early history of any one of these cities, say New York, we find examples of conflagrations that have swept away square miles of closely built wooden houses overnight. When this particular city was only a little port town of less than 25,000 population, and its houses were mostly wood with a few brick fronts, a fire broke out at midnight that burned until noon of the next day, laying in ashes 493 houses. And but two years later another fire burned an entire block to the ground. Fig. (1).

Such experiences convince the leaders in any community that no one should be allowed to build just for his own personal requirements in a community thickly populated. In 1761 laws were passed in New York prohibiting all wood dwellings within a certain area, and requiring that all dwellings within this designated section be built with exterior walls of brick, for in those days the brick house with interior construction of wood was considered as fireproof as building construction could be made. At least, the brick exterior wall helped to confine an isolated fire within its walls until the volunteer fire department could extinguish it. But the population was not ready for this law, for it had grown up with wooden-frame houses, and could not see why any restrictions should be placed upon their personal liberty to build as they saw fit. Nearly 3,000 citizens sent in a petition to have the law repealed, which, however, was not granted. But this public opinion was reflected in lax enforcement of the law. The community had to be taught a lesson by some fearful fire in which homes and lives would be sacrificed to make them understand; and the lesson came.

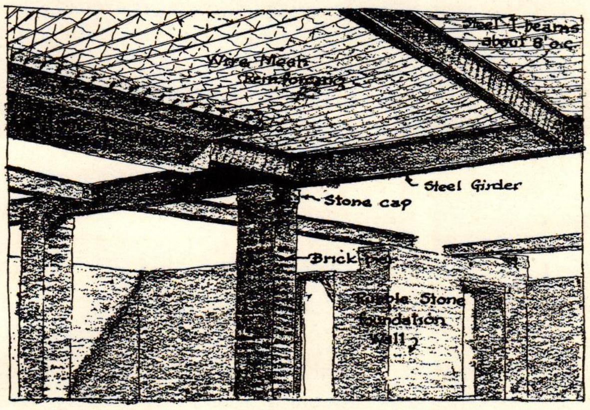
Soon after, the power was given to the fire wardens to supervise the construction of new buildings, and prevent anything but brick-walled buildings from being erected within a certain restricted area, bounded by streets that were designated as the fire limit. That was as far as progress along this line was carried until 1860. In this year a separate building law for New York was enacted. This helped some, but none had the vision in framing this law to see that some time in the future these brick-and-wood structures would be extended upward five, six, and seven stories and cover large areas of ground. In those days there was no need to restrict the height or the area of buildings which were not fireproof.

The day came, for all that, when people began to be so crowded within the city limits that they lived one above the other and close to each other, housed in tenements of five to seven stories in height, packed by the hundreds and thousands within the limits of a block. These shelf-like dwellings were constructed of wood on the interior, although they were enclosed with brick walls. If a small single detached house is burned, only one family is endangered if it spreads no further. If one tenement of wood and brick burns, a hundred and fifty people or more are in danger of death. But, worse, the whole block is endangered, for once a great fire is begun within the walls of so large a house, the heat will spread the fire to others, and then the block is threatened, even the whole city.

Thus, the heights to which buildings of this kind may be erected need to be regulated for the general safety of the community, and the area of their floors, enclosed with brick



METHOD OF CONFINING FIRE
FIG. 2



First Floor Construction Over Cellar
Fig. 3

walls, must also be limited. Into the laws crept regulations governing these things, and we find that in some cities the limit of height to which these brick-walled wooden buildings can be carried is four stories, or 55 feet, although in New York six stories are permitted. Likewise we find regulations restricting the floor area of such buildings to a maximum of 3,000 square feet. That is, the area may be greater than this on any floor, but it must be divided up into sections with interior brick fire-walls, and these sections must not exceed the prescribed area. This is for the purpose of confining the fire as much as possible within compartments, that its spread horizontally may be impeded, giving the fire department an opportunity to extinguish it. The vertical brick walls act a good deal like the water-tight compartments in a ship. If a leak develops in any such compartment, the water is permitted to fill only one section of the vessel and not the entire ship. If a fire develops in any section of an apartment, it may gut out the interior from first to top floor, but the fire-walls may make it possible to confine it within that section, and only those apartments which are within the limited section and above one another may be injured. Fig. (2).

But regulations of this kind were not brought about overnight. Great property loss and human lives had first to be sacrificed upon the altar of knowledge. Be that as it may, to-day there are some who think such restrictions are a hindrance to building and a hardship upon the builder.

And so it comes to pass that our modern conception of ordinary tenement-house construction is one of a brick-walled wooden structure which is limited in its height and sectional areas. But more than this, details are planned by which the spread upward from floor to floor of the fire is impeded with various devices which we call fire-stops. The object of these details is not to give a false sense of security against fire, but to slow down its progress, that time may be given for the escape of tenants and the work of the firemen. Such a thing as requiring heavier wooden floor-beams than ordinarily used in light frame dwellings is an example, for it is well known that it takes longer to burn a 3-inch by 12-inch floor-joist than to burn a 2-inch by 12-inch.

Underlying Principles

Considering the above-mentioned type of construction, which we call "ordinary construction," from a general point of view as we find it to-day, it is quite evident that the fundamental idea that has been the greatest in moulding its customs has been that of making such construction slow burning, within an economic limit. A second factor has been the desire to eliminate as far as possible the dangers which overturning walls or collapsing floors have for the firemen fighting the conflagration. A third factor has been the need for providing safe exits for the tenants, that they may escape while the building is burning and not be trapped and forced to plunge to death within the flames, or jump from high windows in desperation, or choke to insensibility from pungent smoke.

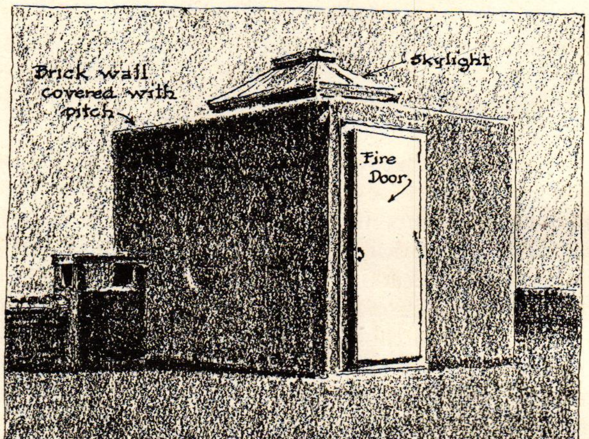
Along another line are the influences which have had much to do with the framing of laws governing this construction. These have been reflected in the desire to produce healthy and sanitary living conditions, in which plenty of light and air were supplied, and waste matters like sewage, slops, and garbage were properly disposed of.

To Create Slow Burning

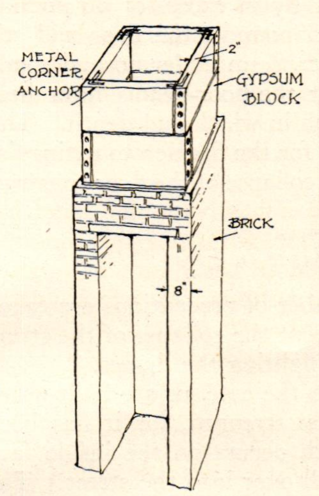
The building which is constructed with floor-joists and stud partitions of wood, even though its exterior walls are of brick, and its height and floor area limited, will be very dangerous if a fire breaks out in the lower stories. From statistics gathered by fire-insurance companies, it has been learned that the great majority of fires start in the cellar, and spread upward through the building. In fact, the natural direction of the fire to travel is upward, since the hot air and gases rise.

This upward spread of the fire in such buildings will be through every vertical passage and crevice through which the hot gases can travel, and from the windows in the lower stories to those in the upper stories. These hot gases of combustion are generally under a certain amount of pressure, due to the expanding force of the heat, and they will be easily forced through small cracks. If they are only as hot as 1,000 degrees F., they will ignite, almost instantaneously, any woodwork with which they come in contact. Even though there are no visible flames, the fire will suddenly break out where the temperature has been raised to the burning-point.

Once a fire gets well under way, this spreading action becomes increased in speed, and the rapidity of the movement is sometimes appalling. Tenants may suddenly find themselves surrounded with bursting flames, although a few minutes before the fire was confined to the floors below. Panic and terror are apt to seize persons so trapped, and they will lose their presence of mind, jumping from windows into the streets fifty feet below, or rushing wildly to and fro, missing some obvious means of escape, which in a cooler moment of reasoning they would have found.



Roof Extension of Stair-well
Vertical Shaft Fireproof
Fig. 4



ROUGH CONTRUCTION OF DUMBWAITOR SHAFT
FIG 5

It is just such considerations that have brought about certain regulations which are intended to slow down the upward spread of a fire. Of course they do not put a stop to the fire, but merely hinder its progress as much as possible.

One of the most effective fire-stops in this class of building is making the first floor over the cellar of fireproof material. Usually steel I-beams encased with concrete are used to support reinforced-concrete slabs. Any fire, then, which breaks out in the cellar will be confined for a long time, for its passage through such a barrier is almost impossible, if the fire department reaches the building in time. Fig. (3).

A modification of the above principle is sometimes allowed for tenements having four stories or less. In these buildings the first floor over the cellar may be built of the usual wooden joists, but their bottom surface must be protected by two coats of mortar on metal lath giving an average thickness of about $\frac{3}{4}$ inch, or by plaster boards at least $\frac{1}{2}$-inch thick with joints carefully filled with plaster.

This same kind of fire-stop is also required to be applied to the under side of wooden beams over stores which are on the first floor, for it has been found that these are often a source of fire-hazard to the building. In fact, in certain sections of cities, stores are looked upon as a very serious source of fires, and better judgment would plan to have the floor construction over them built of fireproof materials.

Nevertheless, this method of cutting off fire from the cellar is not of much account, if it can pass up through the stair-wells or rush up through dumb-waiter shafts. A restriction has, therefore, been established which does not permit the main stairway, or any stairway, to be carried down to the cellar in tenements more than four stories high. In such buildings the only method of passing from first floor to cellar is by going outdoors and down steps in the court.

This, from a point of view of control by the janitor, is not convenient, and when the building is small (four stories or less, with not more than two families per floor) the main stairway may be permitted to run down to the cellar, if it is properly enclosed with a fireproof partition and cut off by a self-closing fire-door made of tin-clad wood or hollow metal.

For all that, the stair-well remains a dangerous vertical communication from the first floor up, and to make it safe the walls enclosing it need to be built of fireproof materials from the foundations up and through the roof. In ordinary construction, brick walls are usually employed, and made 8 inches thick for the upper 30 feet, and 4 inches thicker for each 30-foot section of wall below. Fig. (4).

Into this stair-well the flames and smoke and gas from any fire in any of the apartments are apt to come, unless some precaution is taken to close off all door openings with fire-resisting doors that automatically swing closed under the action of spring hinges. Even with this precaution, there is a possibility of hot gases breaking through the windows and cutting off the escape of tenants who are hastening down the stairs. Wire glass should, therefore, be used in these windows, and metal sashes and frames be employed. But the skylight at the top of the stair-well ought not to be of wire glass, for this ought to be shattered when a hot gust of smoke and fumes strike it, so that it may be permitted to escape into the open. This requires, however, that the glass of the skylight be protected above with a wire mesh (about an inch square) placed 6 inches above the glass and extended beyond its edges that much to protect it from being broken by falling objects. Also a mesh of wire needs to be placed under the skylight to catch any bits of glass that might break and fall down into the stair-well.

Even so, the precautions taken to prevent the spread of fire up through the stair-wells will be nullified if the dumb-waiter shafts are not protected. These could easily act as flues for a fire developing in the cellar and transmit the hot gases to the upper floors. In many old buildings, dumb-waiter shafts were built of wooden studs, lathed and plastered, and all doors were of wood. Nothing could be better planned to help spread a fire upward.

But these dumb-waiter shafts should be carefully constructed of fireproof materials, and most laws require them to be so built. Their foundations in the cellar are usually constructed of brick and are 8 inches thick. If concrete is used, the thickness ought not to be less than 5 inches.

From the first floor up to the roof, the commonest material used for building these shafts is gypsum block, 3 inches thick, set in gypsum mortar and strengthened at the corners by metal angle clips or anchors. Fig. (5).

But partitions of brick, hollow terra-cotta tile, concrete, and metal lath and plaster may be used, although the gypsum block seems to be the most popular. When these block partitions are extended through the roof, it is necessary to protect them from the weather, which is done by covering them with corrugated galvanized iron.

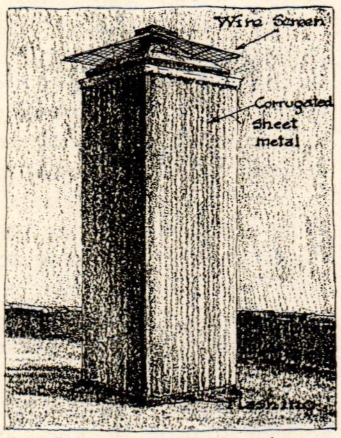
All openings on different floors into these shafts should be protected with hollow metal or tin-clad wood doors, which are self-closing, under the action of spring hinges.

On the tops of these shafts should be skylights of glass —not wire glass—for this will not shatter under heat and allow the smoke to escape. However, such skylights must be protected from falling objects by 1-inch mesh wire screens, placed above them. Fig. (6).

There are other vertical passages which may act as secret ways for fire to spread upward. These are the crevices in the wood construction. For example, where exterior walls of brick are furred off, a space of about 1 inch is left between the plaster and the wall up which hot gases could pass. By projecting the brickwork outward at each floor level, this passage can be blocked off once in every story. Fig. (7).

Then, too, the chases in the other walls in which pipes are run may also be fire-stopped (filled solid with concrete, mineral wool, brick and mortar, etc.) at each floor, and metal sleeves may be built around all pipes which pass through floor construction.

Even wooden partitions, built of studs and lathed and plastered both sides, which come one



Roof Extension of Dumbwaitor Vertical Shaft Fireproof
Fig 6.

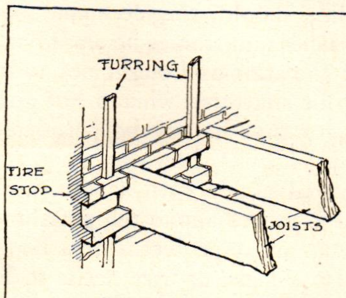


FIG 7

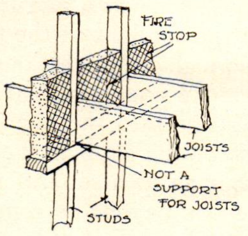


FIG. 8.

above the other, and have the studs of the upper partition resting upon the cap of the partition on the floor below, need to be fire-stopped. This fire-stopping material ought to extend from the cap of the partition below up to at least 4 inches above the floor. Fig. (8).

Then there is always danger of fires hiding behind wooden wainscots, so the plaster ought to be carried down behind them.

Wherever floor-joists are framed about a chimney, the space that must be left between the woodwork and the chimney ought to be filled with fire-stopping material.

Thus every crevice or crack up which the hot gases of conflagration might pass should be closed, if possible by some non-combustible material, and in this way the progress of the fire upward from one floor to the other may be retarded.

Unfortunately, although laws require the fire-stopping described above, yet there are many practical conditions which nullify the full protection which is intended. A false sense of security is often given, when really danger still exists. Usually this fire-stopping is installed by common laborers who ram the material in place in the most haphazard fashion, leaving crevices all about it. Hot gases easily find a way up through such cracks. Then, if brick or concrete is used, a crevice between the wooden floor-beam or stud soon develops when the wood dries out or settlement takes place, for the brick or concrete does not change its shape and expand to fill up the extra space left by the shrinking wood. Mineral wool, to a certain extent, is more capable of filling up these places in a surer fashion, because of its flexibility. But rarely is a builder found who would go to the expense of using this material for this purpose. In most cases, then, we go on fire-stopping the floors of these apartments because the law requires it, but it is a great question whether there is developed much safety when such careless work is permitted.

But, theoretically, if the fire has been retarded from passing up through the hidden places, then it must burn through from one floor to the other in the open. By making all joists 3 inches thick or more, even though the strength of such thick joists is not required to carry the loads, the fire will take longer to burn through them, and their ultimate collapse will be delayed beyond the time when a 2-inch-thick joist would break from the weakness of reduced size caused by the consuming action of fire. For example, suppose that 3-inch by 10-inch beams of long leaf yellow pine were spaced 16 inches on centres and used over a span of 21 feet, then by computations based on the exact sizes of such beams we would find that we could carry on such a floor a load of 90 pounds per square foot. If the fire burned an inch from the thickness and the depth, making the beams 2 inches by 9 inches, the floor would still be capable of supporting about 47 pounds per square foot, and as the live load which is supposed to be developed on the floors of tenement houses is never theoretically in excess of 40 pounds, and actually not more than 25 pounds, the floor will still have enough strength in it to stand up under normal conditions, even for some time after the floor-beams have been burned down more than an inch in width and depth. This leaves a certain amount of time for the firemen to extinguish the flames before there is a total collapse of the floor construction.

To Prevent Collapse in Fire

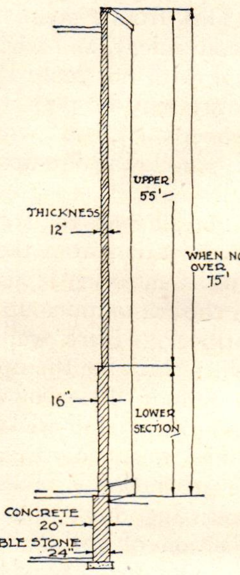
To a certain extent, a number of precautions are taken in ordinary construction to prevent the collapse of the structure upon the firemen who are fighting the flames.

For example, brick walls on the exterior are built much thicker than required for actual strength, for it has been found that the expansion which occurs on the inside face in a fire tends to topple the wall over into the street. The various thicknesses which are specified in the building codes are planned to reduce this danger to a slight extent, since the thicker the wall, the more stable it is under the expanding action of heat.

From a simple calculation, a 12-inch-thick wall can be shown to be strong enough to be carried up 300 feet or more, but any one can appreciate that its lateral stability would be very inadequate. Not only must exterior and interior walls be increased in thickness for stability, but they must be made heavier when their length between cross walls is great, or when excessive window openings are built into them or when pipe chases and niches burrow around in them.

As ordinary constructed tenements will not be built higher than five stories, they will be less than 75 feet in height, in which case the exterior walls should be 12 inches thick for the upper 55 feet, and 16 inches thick for the section below that. The foundation walls should be 20 inches thick if of brick or concrete, and 24 inches thick if of rubble-stone. Interior walls should be 8 inches thick for their uppermost 55 feet, and 12 inches thick for their next lower section. Fig. (9).

In order to prevent the overturning even of these walls in a fire, due to the lever action of the ends of falling tiers of floor-beams, as they burn through and drop out in a conflagration, it is necessary to cut back their ends diagonally. That is, their ends instead of being cut vertically are cut at a slant. Measuring 3 inches back from the end of the beam along the top to a point, this cut extends, from this point, diagonally down to the extreme end of the lower edge of the beam, forming an end on the beam similar to that on the front of ice-skates. When a beam so cut (fire-cut) burns through, it can fall from the brick wall without prying up the brickwork. Then, too, the metal anchors which are fastened to the ends of these beams at intervals of about 6 feet should be placed near their lower



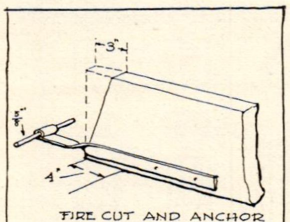
WALL THICKNESS
FIG. 9

edge and not their upper edge for the same reason, since any anchor fastened to the top of a beam will pull out the brickwork when the beam falls, but will only bend if fastened to the bottom. Fig. (10).

But by far the most important precaution taken to prevent collapse in a fire is the elimination of all interior wooden stud partitions as supports for the interior ends of floor-joists. In light wooden-frame dwellings the interior ends of joists are held up by wooden stud partitions, but if this kind of construction were used in tenements having four stories or more, disastrous results would follow in a fire, for the flames might consume the partition on the first floor, and so remove the support for all of the joists on the floors above. A sudden and fearful cave-in would follow.

However, this method of supporting is not used, but brick walls are substituted, or steel girders held up on steel columns maintain the floor-beams. Steelwork of this kind ought to be fireproofed, but this is not always done as it should be. In time of fire, exposed steel columns and girders of such importance may twist and bend so much that they will cause a partial collapse of the structure.

In fact, heavy wooden columns and heavy wooden girders are better than exposed steel columns and girders in this respect, for they will not warp out of shape in a fire, and they will not readily collapse, until well burned through. Sometimes cast-iron columns are used, but they are liable to suddenly fracture if, after they are heated, they are struck by the stream of water from the fire-hose. Concrete-filled cast-iron or steel columns are better in this respect.



FIRE CUT AND ANCHOR
FIG 10

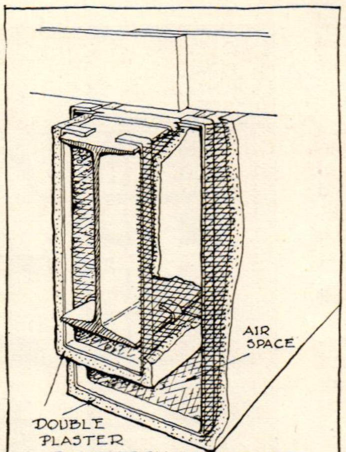
However, all metal supports ought to be protected by at least 1-inch thick coat of cement plaster on metal lath. If steel beams or columns are used to support masonry walls, these ought to be covered with 2 inches of fireproofing like brick, hollow tile, or concrete, or by two layers of plaster on metal lath with an air-space between them. A tenement house having the first floor occupied with stores, opened at the front with plate-glass windows, requires that the support of the upper front wall be upon steel beams and columns. In a fire, if this metal is not protected, there is danger of a destructive collapse. Fig. (11).

Other Consideration

There are a few more details of construction which ought to be noted here, and one of them is the construction of party or dividing walls between buildings. Wherever one brick wall along the lot line is used for the support of the floor-beams of the two adjoining buildings, it is called a party wall, and usually is constructed thinner than outside walls. Such walls are possible in low buildings that are erected in groups. However, there is much danger attached to them if care is not taken to properly arrange the floor-joists in them so that there exists sufficient masonry between the ends of the joists of one building and those in the adjoining building. It would be very easy to construct the floor-beams of one building on a line with those in the next; in fact, it would be the natural thing to do. In this case there might be practically no masonry between the ends of the beams, and a fire burning in one building would eat its way through the holes left by the burned-out floor-joists through to the wood ends of the floor-joists on the other side of the party wall. Thus, the fire would spread from one building to the next.

To correct this error the beams in one building ought to be staggered in relation to those in the next, and at least 6 inches of masonry built between the ends of the beams on one side and the ends of the beams on the other side of the party wall. If they cannot be staggered they ought to be supported upon a corbelled-out ledge of not more than 2 inches in width, so that there is an 8-inch thickness of brickwork, at least, between the ends of the beams on each side of the wall.

Then, too, all dividing walls, such as these party walls, ought to be carried above the roof 2 feet, and capped with stone or terra-cotta tile. In this way fire will be blocked in passing over from one roof to the other.



PROTECTION AGAINST FIRE
FIG. 11

Safe Exits

The problem of constructing safe exits in buildings of this character is too intricate to consider within the limits of this one article, and will be considered at a later time in more detail. It will be sufficient to say here that in tenements of ordinary construction there should be provided for every family at least two ways of escape, protected from the fire in the rest of the building. These two ways of escape should be as remote from each other as possible, so that if one is cut off by flames and smoke, the tenants may escape in the opposite direction and down the other way.

The usual custom is to have the main stairway enclosed with fire-resisting brick walls, as previously described, having all doors which open on to it of fireproof design. The stairs themselves are of fire-resisting construction. This makes one means of escape.

At the opposite side of the building are generally built fire-escapes which serve as the other means of escape, should the smoke cut off the main stairway. These fire-escapes, as built, are usually very poor exits, for they are of open, light ironwork with metal ladders leading from one balcony to another. Such flimsy-looking construction frightens many people, and they become panic-stricken, often refusing to climb down. Then, too, if tenants trying to escape downward find that the fire is below them, they may not be able to pass by the windows opening out of those apartments which are in flames, for the heat passing through the glass may burn them, or the glass may shatter and pour great quantities of smoke and flame out upon them.

Another type of secondary escape is planned that is called a fire-tower, and consists of an enclosed stair-well within a fireproof shaft. Such a means of escape is all well and good so long as smoke does not get into it, but as soon as this happens, there is great danger of the people travelling down it becoming suffocated.

The only safe types are the smoke-proof towers and properly designed outside exit stairways, but these we will consider in a later article.

Book Reviews

DOMESTIC ARCHITECTURE OF THE AMERICAN COLONIES AND OF THE EARLY REPUBLIC. By FISKE KIMBALL. Illustrated with more than 200 photographs and plans of the best examples of Colonial houses. Charles Scribner's Sons, New York. Published under the auspices of the Metropolitan Museum of Art.

This handsome volume, that has grown out of a series of lectures delivered at the Metropolitan Museum of Art in New York and is now issued under their auspices, deserves a distinctive place on the shelf or table containing books that first of all are founded on careful and patient research. The author, knowing what a wealth of books have already been published on the subject, has set about his task with a deliberate intention of writing a book that shall have for its main purpose the investigation of facts, the determination of essential and verifiable details of construction, plan, and design upon which to base an intelligent and right use of the past in the present. He has not ignored the traditional questions nor overlooked the claims of earlier writers and authorities, but, while recognizing them, he has gone to original sources of information, and by so doing, defined and made clear many points in the origin of our Colonial architecture that heretofore have been more or less based on presumption rather than on actual research.

With an ever-increasing interest in a revival of Colonial elements in residential construction there is a great need of just such a book as this, if we are to avoid anachronisms and the confusion of elements that are so commonly classed, too often with a total disregard of truth, as Colonial of a particular period.

There are old houses still standing all over New England, and Mr. Albert G. Robinson's two volumes, "Old New England Houses" and "Old New England Doorways," have happily preserved many of them for us in his admirable photographs. Many of these are attributed to certain early dates by their owners, with obviously later additions in the way of porches and other details. All these additions are confusing to the seeker after the original and contemporaneous design, and, as a rule, there is no way of locally verifying and establishing actual dates.

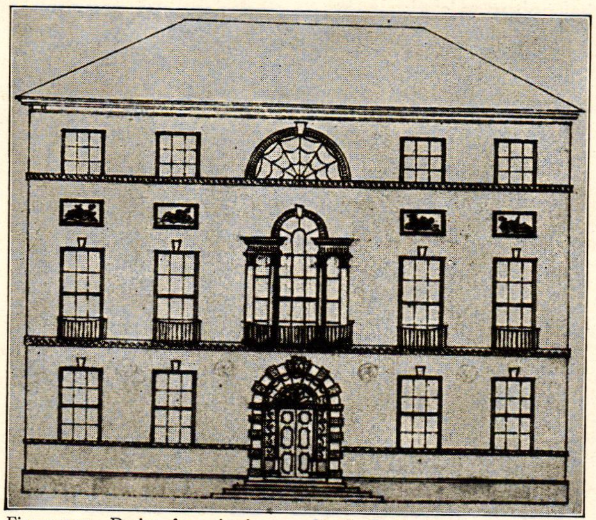


Figure 172. Design for a city house. Charles Bulfinch, after 1796. From the original drawing in the possession of the Massachusetts Institute of Technology.

It has long been thought that the log cabin was the first and natural home of the early settlers in the Colonies, but Professor Kimball makes it clear that this was by no means common and that houses of this kind were chiefly confined to settlements on the Delaware, built there by the Swedes and Finns, in whose native lands it was a customary form.

The first buildings of timber in the Colonies seem to have been of trunks or planks stood vertically, like palisades.

The first framed houses were erected in the Colonies as early as 1611. Ralph Harmore, Secretary of State from 1611 to 1614, wrote of Jamestown: "The Towne itself by the care and Providence of Sir Thomas Gates is reduced into a handsome form, and hath in it two fair rowes of houses all of Framed Timber (two stories, and an upper garret, or corne loft high)."

In the New England Colonies framed houses were erected soon after their settlement. In Salem in 1629 there were "about half a score houses and a fayre house newly built for the Governor." Of one of these Governor houses the detailed description is given. It was one room deep and two and a half stories high, besides a cellar—with chimneys on both ends of the building.

"The Colonial style of the Seventeenth Century was essentially mediæval, its significant element—structure: form and details continue traditions of the middle ages."

Professor Kimball gives a list of ten houses, all in Essex County, Massachusetts, whose dates have been authenticated. You will find in the chapter on "The Seventeenth Century" information about the early use of stucco, rough cast plaster walls, shingles, sash and lead casements, doors, plastering, staircases, the use of lime, the first brick house in Salem, the development of the more extensive use of brick, the size and character of brick used, bonds, slate and tile, the early "Gambrel" or curb roof, chimneys, doorways, windows, interiors.

Beginning with the eighteenth century, the academic spirit and academic architectural forms won the upper hand in Colonial architecture just as they had in England.

The familiar and much written about Georgian Period began with the reign of Anne, and it is to this period that we generally turn for the familiarly accepted Colonial forms. In New England, John Smibert and Peter Harrison, two gifted amateurs, were identified with important public work, but the styles used in the Colonies were chiefly brought to America in books, of which there were quite a number available."

"The prevailing belief has been that the most characteristic architecture was the Colonial work of the eighteenth century, and that conditions peculiar to America at that time gave it a character more nearly our own than that of any later phase of style. Our study of the evidence forces the conclusion, on the contrary, that the special effect of these conditions in Colonial architecture has been much exaggerated. As in the first primitive shelters, there was little in the later buildings of the colonies which did not find its origin or its counterpart in provincial England or other parts of Europe of the same day."

The use of masonry became much more common in the eighteenth century for houses of importance, though wood continued to be used for ordinary dwellings. In New England, however, wood continued to be the prevailing material even for the finest dwellings.

The plans of the eighteenth-century houses showed a much greater consideration for privacy in the use of extra stairways and halls, and the illustrations in this chapter include a number of typical plans of well-known houses in various parts of the country.

Such interesting and important structural details as the use of bays, height of ceilings, gable and hip roofs, decked roofs, balustrades, dormers, cupolas, the first use of pilasters, quoins, rustication, pavilions, the orders porches, engaged, columns, pediments, the "peazer"—(Copley writes from New York in 1771: "Should I not add Wings I shall add a peazer when I return").

There is no detail that might be of use to the architect that has not been considered and referred to in the text or shown in the illustrations. Following the Revolution and the advent of the new Republic came the great classical revival with Jefferson as the prophet of the new gospel and with other distinguished amateurs playing an important part. Among them was Bulfinch, who introduced the style in New England.

Samuel McIntire in Salem and John McComb in New York were famous names. The Adam influence was made evident, and there were many books published, based on the study of famous European architects. Among the innovations based on the classical ideals were the buildings modelled on the temple, a simple rectangular mass with a columnar pediment. Here Jefferson was a leading factor and "he had formulated an ideal which was ultimately to rule in American domestic architecture." The house with the projecting saloon owed its introduction to Jefferson, who adopted an octagonal projection in building Monticello, and under Bulfinch's leadership the house with the projecting saloon of oval form became a feature in Boston and other parts of New England. Samuel McIntire at Salem followed Bulfinch's example.

Professor Kimball says the use of the temple form spread all over the country, and it has been in evidence in the states beyond the Alleghenies and the Ohio, for many examples are still to be observed.

Here is a book, then, that is not so much of a formal history as it is a practical analysis of those elements of our architecture that have been embodied in some of the most famous examples in this country. The architect will find material here available in no other book regarding such details as doorways, balusters, stair-ends, panelling, ceilings, mantels, and the like, identified with famous historical houses, and plans of Bulfinch and others shown for the first time.

We can hardly say too much in praise of the patient research, the gathering and comparing of old documents, the assembling of unpublished material, the remarkable collection of photographs, of plans and details, and the admirable directness with which the book is written. Professor Kimball, himself a trained architect, set out to write first of all a book of value for the profession; and he has succeeded in making it one that every architect should be grateful for. There is a valuable chronological chart giving the dates and authorship of houses established by documents of Colonial times and of the early Republic, and a Series of Notes on individual houses, giving date, authorship, and original forms.

"Summarizing the development of style in interior detail," the author says, "we may distinguish several successive phases. First, a transitional or 'Post-Colonial' phase, represented by the Langdon, John Reynolds, and John Brown houses, in which certain minor elements of novelty appear in houses fundamentally Colonial in style. Secondly, the phase of Adam inspiration proper, beginning with isolated houses in the eighties, but dominating from around 1792 to about the time of the Embargo of 1807. Then followed the era of free modification of Adam forms exemplified by Benjamin's book of 1806 and the Salem houses after the peace of 1815. Finally, about 1825, begins the supremacy of Greek forms."

(*Continued on page* 56)

Building Supervision

By Richard P. Wallis

THE duties of the architect or engineer engaged in the erection of a building or other structure naturally group themselves under three headings: the preparation of plans, the writing of specifications, and the supervision of the work as it progresses.

The preparation of plans entails the making of drawings showing plans, elevations, cross-sections, and large-scale details of the proposed structure. These drawings are for use in connection with the specifications in explaining to the contractor the character of the work on which he is expected to estimate and later build.

The specification is a more or less lengthy statement enumerating the conditions under which the work will be carried on, detailing the responsibility of the parties concerned and describing at length what materials are to be used and in what manner.

The work of supervision pertains to directing the efforts of the contractor during the period of construction, insuring proper regard for the requirements of the plans and specifications, checking his estimates, answering all of the questions that inevitably come up in the course of construction, and in expediting in all possible ways the progress of the work.

It is not difficult to appreciate the importance of the part played by supervision in the construction of a building. Careless supervision may, by wittingly or unwittingly allowing the contractor to substitute inferior materials or workmanship, nullify wholly or in part excellent drawings and clear, concise specifications, resulting in a building structurally unsound or artistically unsightly. Indifferent supervision may easily delay the progress of work and destroy the confidence of the owner in the ability of the architect. Questions are left unanswered, decisions are delayed, and the efforts of the contractor to expedite his work rendered fruitless by the lack of attention shown by an incompetent supervisor.

It is usually difficult, no matter how complete the plans and specifications, to foresee every contingency and to provide against them, and unless the architect's superintendent or supervisor, as we shall call him to distinguish him from the contractor's superintendent, is capable of handling in an energetic and able manner these matters as they come to his attention the contractor is very likely to be left to his own discretion in the interpretation of matters both structural and decorative. A situation of this kind reflects but small credit on the architect or engineer, and tends to destroy the confidence of both owner and contractor in his professional ability.

The term supervision, as generally understood, refers to the overseeing of the work of the contractor during the period of construction. There is, however, another phase of supervision, that for lack of a better title may be termed preliminary supervision. This refers to the careful check of plans and specifications that takes place in the architect's office before these documents are finally released. There seems to be but scant hope of attaining absolute perfection in plans and specifications, but the nearer this goal is approached the more will the cost of building operations be reduced and the satisfaction of the owner correspondingly increased.

The quality of the preliminary work has a direct bearing on the amount and character of the supervision of construction that follows and should be considered in this connection if for no other reason. It is self-evident that inaccurate and conflicting plans, poorly drawn details, and indefinite and ambiguous specifications will make additional work for the supervisor. The honest contractor will be constantly in doubt as to the intent of the architect and will be forced to proceed as best he may, while his unscrupulous competitor will welcome with enthusiasm the opportunity afforded him of demanding extras and of doing his work as cheaply as possible at the expense of the character of the finished structure.

It is under such circumstances as the latter that a supervisor appreciates plans and specifications that are explicit and that leave no loophole for the scheming contractor to wiggle through. The supervisor will, in any event, be compelled to exercise constant vigilance to see that the contractor fulfils the terms of the contract, but there will not be the incentive for the contractor to try "to get away with something" when he realizes that the plans and specifications are so drawn as to leave him but small hope of ultimate success.

The experience of the supervisor in thwarting such attempts on the part of the contractor of taking unfair advantage of the situation should be placed at the disposal of the drafting-room and specification writer so that any omissions or mistakes that may have been made in the preparation of previous plans and specifications may not be repeated. The supervisor is in a position, owing to his daily intercourse with the contractor, to note to what extent the plans and specifications are successful in their mission. His criticism is of real value in this connection and his advice should receive careful consideration as it is decidedly to his interest to have adequate plans and specifications.

These considerations lead us to the conclusion that preliminary supervision has a very direct bearing on the subsequent supervision of construction and that supervision of construction may be said to commence, not when ground is broken or when materials are first delivered to the job site, but in the drafting-room and on the specification writer's desk.

The writer has had occasion to supervise considerable work and has, from time to time, noted down various recommendations that appealed to him, both for future guidance in the conduct of his own work and as suggestions to the designer and specification writer as to how they may improve their part of the work to the end that the job may receive the very best in the way of plans, specifications, and supervision.

Some of these suggestions are submitted in the following pages. It may be that many of these recommendations lack the merit of originality, but it should be remembered that a repetition of well-known and fundamental truths is essential for a thorough understanding and a proper execution of a work as important and as diversified as is the business of building.

I. Plans

We will first consider somewhat briefly the function of the plans and how these may be prepared so as to render them of maximum service both to contractor and architect in the successful execution of the contract.

The purpose of the plans, as stated above, is to provide the contractor with that part of the information which may be conveniently shown in graphic form. Only in so far as this information is presented in a clear and logical manner will they be successful in their mission.

It would be well at all times for those interested in the preparation of plans to keep in mind the ultimate purpose for which they are intended and how best this purpose may be served. Plans, as soon as completed and approved, go into the hands of the contractor for the purpose of estimating. The contractor's estimator, having no previous acquaintance with the project, must rely entirely upon the plans as submitted to him for the purpose of arriving at his estimated cost. The more definite are the plans, the more intelligent will be the resulting estimate of quantity and quality. This accurate estimate should result in a contract price much nearer the true cost than if the estimator were forced, owing to an unintelligible presentation of the facts, to make allowance for the various items not clearly shown. If he is an experienced estimator he will, whenever doubt exists, endeavor to amply protect the interests of the contractor by submitting a figure high enough to cover any unexpected interpretation that the architect may seek to impose on the contractor after the contracts are signed and the work is under way.

Plans should not be submitted to the contractor, for the purposes of competitive bidding, in an unfinished condition, if it is possible to avoid doing so, as the resulting figures will invariably be in excess of the true cost, and the owner will be penalized. Much more conservative figures may be expected when the drawings submitted are complete and accurate in every detail.

The plans should be so drawn as to serve as a basis for the erection of the building as well as for arriving at the estimated cost. In this capacity they must show clearly and distinctly the information that will enable the contractor to proceed with his share of the work. The drawings pass into the hands of those unfamiliar with the problem and who must acquire their information from these sheets. They are hindered or helped in their interpretation by the manner in which the information is presented on the drawings. Too often the draftsman engaged in the preparation of plans loses sight of, or is entirely ignorant of, the specific needs of the contractor, and the resulting drawings, while possibly excellent examples of draftsmanship, are worthless or practically so to the man in the field. If the draftsman is competent, can visualize thoroughly what he is attempting to show on paper, and is familiar with field conditions, he will experience but little difficulty in expressing himself through the medium of the plans in such a manner as to enable the contractor to familiarize himself with the proposed requirements. But too many draftsmen are unfamiliar with field conditions to properly appreciate the problems that confront the man in the field. To them the drawings become the ultimate objective, and but little thought is given to a consideration of whether or not the information on the plans is presented in a manner easily understood by the contractor and his foreman.

Some thought should be given to the dimensioning of a drawing, unless it is considered sufficiently accurate to have the contractor scale his dimensions from the blueprint. When the amount of distortion possible in a blueprint is considered this method is seen to have its obvious disadvantages. The principal parts of a building should always be carefully dimensioned and checked and the minor measurements referred to them, as the contractor follows very closely that order in laying out the work in the field. When the same dimension is shown on various sheets care should be taken to see that the corresponding figures agree. It is always preferable to run the risk of showing more dimensions than are necessary on the plans than to risk having too few. Experience alone will determine the amount of dimensioning necessary on a plan in order to make it fully intelligible to the contractor and yet not fill up the sheet with unnecessary figures. The horizontal dimensions should be shown on the plans, leaving the vertical dimensions to be placed on elevations and cross-sections. In dimensioning interior distances, figures should refer to the rough masonry partitions rather than to the finished plastered surface, or the dimensions may refer to the centre of the partitions. Either of these methods is preferable to taking dimensions to the finished plastered surface. The reason for this is obvious, as the contractor must first locate and build the partition before it can be plastered and as any deviation from plumb in the wall is taken up in the plastering.

The architect should indicate, in a sufficient number of places on the plans, the various floor elevations. The inclusion of such figures greatly facilitates not only his own work in making the layout, but renders the plans much more legible to the contractor, particularly when the requirements of the building necessitate a floor at varying elevations.

Wherever the locations of sections are indicated on a plan they should be marked with heavy arrows and prominent letters, so as to be plainly visible and thus eliminate the lengthy search that is all too common to so many drawings.

While discussing the form of presentation of drawings, it might be advisable to speak of the scale to which the drawings should be made. As a general rule the working plans should be made at a scale of $\frac{1}{4}$ inch to the foot. This enables the architect to show considerable detail on the plans, which is always a welcome sight to a contractor's superintendent. Frequently it becomes necessary for practical reasons of size to limit the scale to $\frac{1}{8}$ inch to the foot. This scale does not permit of much in the way of detail and unless accompanied by explanatory notes and scaled details, the contractor is forced to supply much of this information himself. These scaled details, when furnished, should be drawn to $\frac{3}{8}$-inch or $\frac{3}{4}$-inch scale and should show the more important parts of the work developed in considerable detail.

It would be well if the architects were to adopt a standard set of conventions for use in indicating on the plans the nature of the material and the type of construction that they wish to show.

Such standards, if universally adopted by the entire building profession, would not only make easier the work of the contractor in estimating and building, but would simplify the preparation of the specifications.

In any event the architect should indicate on his plans whatever set of symbols he is using and should see that they are subscribed to in all work pertaining to that particular set of drawings.

Another fruitful source of misunderstanding and complication is the mechanical equipment drawings in their relation to one another and to the structural drawings. The general layout for these drawings is usually taken directly from the working drawings and the various equipment added. This includes plumbing, heating, and ventilating, and sometimes electrical layouts. A careful check of these

Drafting-Room Mathematics

By DeWitt Clinton Pond, M.A.

FOURTH ARTICLE

A PROBLEM that is similar to the one given in the last article is one in which it is necessary to locate column centres along a street front which is not at right angles to the one which is adjacent to it. In Fig. 13 a diagrammatic plan is shown in which such a condition is found. The column centres, which are typical, are located either parallel to or at right angles to A Street. B Street is at an angle of 99 degrees and 35 minutes to A Street. The first column centre line, parallel to A Street, is 1 foot 6 inches back of the building line, the next is 20 feet 10 inches back of this, and the next two are 20 feet and 21 feet apart respectively. The problem is to determine the distances between column centres along B Street.

The column centre line parallel to B Street is 1 foot 4 inches back from the building line, but for engineering reasons column 1 is located 1 foot 9 inches back. This complicates matters somewhat. The first step will be to find what the distances along B Street will be if all the columns are 1 foot 4 inches back and then to make the proper corrections for column 1.

The first step is similar to the one taken in the last article. The logarithms of the trigonometric functions of 9 degrees 35 minutes must be placed at the top of the architect's sheet of calculations. These are as follows:

log sin 9 degrees 35 minutes = 9.22137
log cos 9 degrees 35 minutes = 9.99390
log tan 9 degrees 35 minutes = 9.22747

The next step is to determine the logarithms of the various known distances. These are 20 feet 10 inches, 21 feet, and 20 feet, and the logarithms are listed below:

log 20 feet 10 inches = 1.31876
log 20 feet = 1.30103
log 21 feet = 1.32222

The logarithms given above were taken from Smoley's parallel tables of logarithms and squares.

It is only necessary to subtract the logarithm of the cosine of 9 degrees 35 minutes from the various logarithms given above to obtain the distances along B Street. It will be seen that the distance between each pair of columns is the hypothenuse of a right triangle of which one of the distances given above is the base. The cosine of an angle is the base of the triangle divided by the hypothenuse, and so to obtain the hypothenuse when the base is known, it is necessary to divide the base by the cosine.

$$\cos A = b/c$$
$$b = c \times \cos A$$
$$c = b/\cos A$$

In order to find the distance between columns 30 and 40 it is only necessary to divide 21 feet by the cosine of 9 degrees and 35 minutes. This means that it is necessary to subtract the logarithms.

log 21 feet = 1.32222
log cos 9 degrees 35 minutes = 9.99390
1.32832

1.32832 = log 21 feet $3\frac{9}{16}$ inches

This checks with the distance given in the figure.

The same method is used to find the distance from column 40 to column 20.

log 20 feet = 1.30103
log cos 9 degrees 35 minutes = 9.99390
1.30713

1.30713 = log 20 feet $3\frac{3}{8}$ inches

The distance from column 20 to column 1 is not, however, as easily found, as column 1 is located 1 foot 9 inches back of the building line, as stated above. In Fig. 14 the conditions which are involved are shown diagrammatically with the angle somewhat exaggerated in order to make the problem clearer. The most direct manner of obtaining the required distances is to consider a point such as designated by the letter *a* which is located 1 foot 4 inches back of both building lines. The distance from this point, in a direction perpendicular to A Street, to the column centre line through column 20 is 21 feet, and from the calculations given above it can be seen that the distance from column 20 to *a*, in a direction parallel to B Street, is 21 feet $3\frac{9}{16}$ inches.

The next step is the determination of the distance from *a* to the corner of the building. By referring to the figure it can be seen that there are two equal triangles, each having one leg 1 foot 4 inches long. It will be necessary to find the hypothenuse and the leg opposite the angle, and for this purpose it will be necessary to use the cosine and tangent of the angle. To find the length of the leg opposite the angle it will be necessary to multiply the adjacent leg by the tangent.

log 1 foot 4 inches = 0.12494
log tan 9 degrees 35 minutes = 9.22747
0.35241

0.35241 = log $2\frac{1}{16}$ inches

To find the length of the hypothenuse it will be necessary to divide the adjacent leg by the cosine of the angle in the same manner as the previous distances along B Street have been found.

log 1 foot 4 inches = 0.12494
log cos 9 degrees 35 minutes = 9.99390
0.13104

0.13104 = log 1 foot $4\frac{1}{4}$ inches

By subtracting $2\frac{1}{16}$ inches from 1 foot $4\frac{1}{4}$ inches it is possible to find the distance from the corner to a perpen-

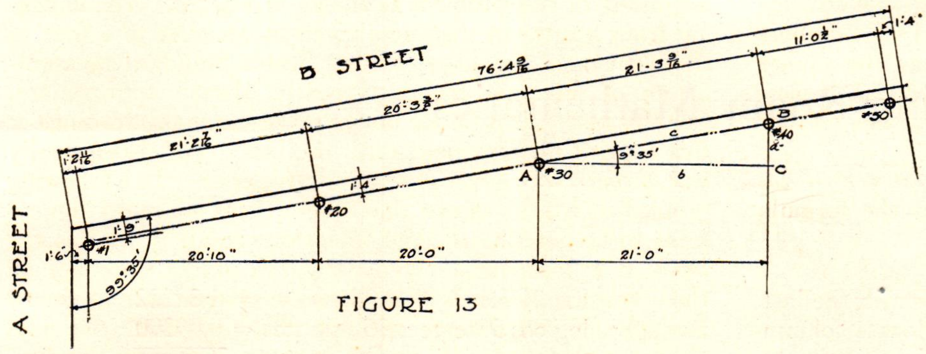


FIGURE 13

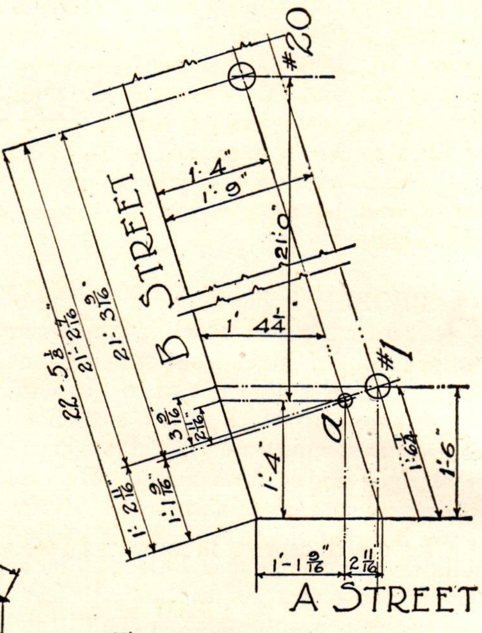


FIGURE 14

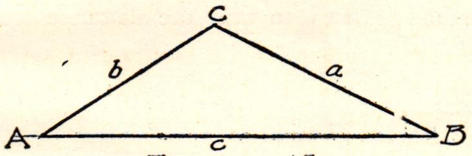


FIGURE 15

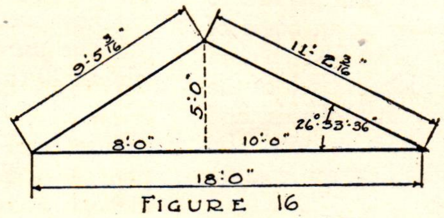


FIGURE 16

dicular through a. This distance is 1 foot $1\frac{9}{16}$ inches. By adding this to 21 feet $3\frac{9}{16}$ inches the distance from column 20 to the corner can be found.

21 feet $3\frac{9}{16}$ inches + 1 foot $1\frac{9}{16}$ inches =
22 feet $5\frac{1}{8}$ inches

It is now necessary to find the distance from the corner to the perpendicular through the centre of column 1. The same method is employed as in the case of finding these distances with regard to the point a, the only difference being that instead of using the distance of 1 foot 4 inches it will be necessary to use the distances 1 foot 6 inches and 1 foot 9 inches.

log 1 foot 6 inches	=	0.17609
log cos 9 degrees 35 minutes	=	9.99390
		0.18219

0.18219 = log 1 foot $6\frac{1}{4}$

log 1 foot 9 inches	=	0.24304
log tan 9 degrees 35 minutes	=	9.22747
		9.47051

9.47051 = log $3\frac{9}{16}$ inches

It is necessary to subtract the second dimension from the first in order to obtain the distance from the corner to the perpendicular through the centre of column 1. This will give a distance of 1 foot $2\frac{11}{16}$ inches. If this is subtracted from 22 feet $5\frac{1}{8}$ inches, the distance, in a direction parallel to B Street, between columns 1 and 20 is found to be 21 feet $2\frac{7}{16}$ inches, as shown in the figure. As the total distance along B Street is 76 feet $4\frac{9}{16}$ inches, and as the centre line through column 50 is 1 foot 4 inches away from the lot line, the distance from column 40 to column 50 is easily found.

In a previous article attention was called to the familiar geometric proposition that the sum of the squares of two legs of a right triangle equals the square of the hypothenuse. If the triangle is not a right triangle, a somewhat different formula is used instead of the well-known $a^2 + b^2 = c^2$. If a triangle has three sides as shown in Fig. 15, and if two sides and the included angle are known, it is possible to find the third side and other angles. The formula which is used is $a^2 = b^2 + c^2 - 2bc \cos A$. In order to show the use of such a formula it may be well to construct a triangle and to check the results by the use of it. Suppose a triangle, similar to the one shown in the figure, can be divided into two right triangles. Each will have an upright leg 5 feet long. The base of one will be 8 feet long and of the other 10 feet long. The hypothenuse of one triangle will be equal to the square root of the sum of 25 and 64, or 9 feet $5\frac{3}{16}$ inches. The hypothenuse of the other triangle will equal the square root of the sum of 25 and 100, or 11 feet $2\frac{3}{16}$ inches. From the information already obtained it will be possible to construct the triangle as shown in Fig. 16.

It will also be possible to obtain the angles, but for the purpose of checking the formula only one angle will be determined. In order to obtain the sine of angle A (Fig. 16) it will be simply necessary to divide the hypothenuse by the opposite side, or 11 feet $2\frac{3}{16}$ inches by 5 feet. It might be noted that the squares and square roots found above were determined by means of the tables of squares in Smoley's book of tables. At the time of finding the square root it is always advisable to note the logarithm of the number.

The logarithm of 5 feet is 0.69897 and that of 11 feet $2\frac{3}{16}$ inches is 1.04853. The logarithm of the sine of the angle can be obtained by subtracting the larger from the smaller of these two logarithms.

log 5	=	0.69897
− log 11 feet $2\frac{3}{16}$ inches	=	1.04853
		9.65044

9.65044 = log sin 26 degrees 33 minutes 36 seconds

In Fig. 16 the triangle has three sides of the following lengths: a = 9 feet $5\frac{3}{16}$ inches, b = 11 feet $2\frac{3}{16}$ inches, and c = 18 feet. The angle A equals 26 degrees 33 minutes 36 seconds. If it is assumed that a is unknown, then it will be possible to obtain the length of this side by means of the formula.

So far the lengths of the sides have been given in feet and inches, but it will be found that for the purposes of the following discussion it will be more simple to use these lengths if expressed in feet and decimals of a foot. The last set of tables in Smoley's book of tables is one giving circumferences, areas, squares, and other functions of numbers from 1 to 1,000. It has been necessary to find the square root of 125 and this was given above as 11 feet $2\frac{3}{16}$ inches. By referring to the table it will be found that the square root of 125 feet can be expressed as 11.1803 feet.

The formula which will be used is $a^2 = b^2 + c^2 - 2bc \cos A$, and by substituting the proper values the formula will become:

$$a^2 = 125 + 324 - 2 \times 11.1803 \times 18 \times \cos 26 \text{ degrees } 33 \text{ minutes } 36 \text{ seconds}$$

The last part of this expression can be solved by means of logarithms.

log 2	= 0.30103
log 11.1803	= 1.04845
log 18	= 1.25527
log cos 26 degrees 33 minutes 36 seconds	= 9.95156
	2.55631

2.55631 = log 360

Having obtained this as the value of $2 \times 11.1803 \times 18 \times \cos 26$ degrees 33 minutes 36 seconds, it is simply necessary to substitute this in the equation in order to find the value of a^2.

$$a^2 = 125 + 324 = 360 = 89$$
$$a = 9.434 = 9 \text{ feet } 5\tfrac{3}{16} \text{ inches}$$

This result checks with the information given at the beginning of this problem as shown in Fig. 16. The changing from lengths or distances given in decimals of a foot to those given in the usual United States Standard measurements of feet and inches is nearly always approximate. For this reason it is better not to make too many readings in this type of measurement until the last. This is especially true if there is a chance of a cumulative error. In a following problem it will be shown that where there are many dimensions to be determined, and where one result is used as the basis of a subsequent calculation it is better to reduce all the known dimensions to a decimal system and to follow through all calculations without changing until the final answer is obtained. When this is determined then the decimals can be converted to inches.

This method holds good, also, if measurements have to be made which are over 100 feet long. Tables of the type found in Smoley's are for dimensions up to 100 feet in length, and for dimensions which are near the maximum the nearest corresponding dimensions in feet and inches are given to the nearest sixteenth of an inch. It is true that architectural dimensions can seldom be measured any closer than the nearest sixteenth, but should it be necessary to carry through a complicated set of calculations with many occasions to convert logarithms to standard measurements, the final result might be incorrect by a measurable quantity.

The method used to check the formula which has just been given cannot be considered as trigonometric proof. The proof of the formula can be found in any text-book of plain trigonometry. The problem was given for the purpose of showing how the formula can be used, and a more extensive use of it will be given in the next article.

The Problem of Ventilation

ANNOUNCEMENT is made of the publication, by E. P. Dutton & Company, of the report of the New York State Commission on Ventilation. This study of the problems of ventilation, made possible through the generosity of Mrs. Elizabeth Milbank Anderson, of New York City, extended from the fall of 1913 to the spring of 1917, and is the most elaborate and thorough investigation of the subject ever undertaken.

While schoolroom ventilation was the main objective of the commission's work, the fundamentals of heating and ventilation are made the subject of the entire first part of the report. The studies thereon are grouped around the following general subjects:

1. What is the effect of the overheating, such as obtains in ordinarily occupied rooms, on the bodily processes and on physical and mental efficiency?
2. What is the actual effect on the body of carbon dioxide, and the chemical substances of expired air?
3. What is the effect of exposure to drafts and to low temperatures and, in particular, what is the relation between previous overheating and subsequent exposure to cold, on respiratory, bacterial infections and on catching cold?
4. What is the actual effect of dry air at high and moderate temperatures? Does dry air harm the membranes of the nose, promote infections, and conduce to nervousness?

Part two, after giving a history of the art of ventilation, gives in detail the scope, methods, and results of intensive studies of schoolroom ventilation of both the mechanical and window types. Studies of humidification, recirculation, and on the location of air inlets and outlets in schoolrooms, with the resulting air circulation, are fully reported.

A brief statement of the results of the field and practical work of the commission will be of interest to architects generally.

The use of windows for ventilating purposes without a suitable means of exhaust for the vitiated air was found wholly impractical. Under these conditions the natural flushing of the room which takes place in milder weather is impeded in colder weather, and this results in an accumulation of the products of human exhalation and a condition of general atmospheric stagnation. The air has high carbon dioxide content and possesses an unattractive odor. The heat accumulates at the ceiling and the floor becomes cold.

The ventilation of the schoolroom by the use of window inlets and gravity exhaust gave much more satisfactory results; indeed, the results thus obtained closely approximated those obtained in the fan-ventilated rooms studied by the commission in so far as atmospheric conditions are concerned. The stagnation characteristics of rooms ventilated by windows alone disappear, and although there is less aeration of the room than in the case of the fan-ventilated room, this does not tend to produce discomfort or injure the health of the occupants. Difficulties are sometimes experienced from back-drafts, and instances may be found where these are so persistent that shut-off dampers must be provided in the exhaust openings, but where it becomes necessary to use these dampers frequently the window ventilation will be vitiated.

Ventilation by the use of plenum fans and gravity exhaust was found to give better results than any form of window ventilation in so far as the aeration of the room was concerned, but to maintain comfortable conditions, with the volume of air customarily supplied, it was found necessary to maintain a slightly higher temperature than in the case of the window-ventilated rooms.

The studies of ventilation by the use of plenum and exhaust fans in combination were not sufficiently extensive to justify conclusions as to the desirability of installing exhaust as well as plenum fans. The exhaust fans have the advantage of maintaining a constant exhaust correlated to the air supply. Such a fan system is more generally applicable to buildings where the local conditions concerning noise, dust, and odor operate against the success of the window-ventilating system, or where the plan or method of construction of the building is such as to eliminate the use of the window-ventilating system.

Concerning the results of the studies of the humidification of schoolrooms, it appears clearly that the observations of the physical and mental conditions of the pupils indicated no material influence of humidification, it being indicated that the air of the humidified rooms was less agreeable as indicated by the opinions of the teachers and observers than the air of the unhumidified rooms, the former being characterized by a more frequent occurrence of odor and stuffiness. There is nothing to indicate that artificial humidification produces any striking improvement in the health or efficiency of school children.

Concerning the use of recirculated air for ventilating purposes, this was found entirely satisfactory at the International Y. M. C. A., Springfield, Mass., for ventilating gymnasiums, but when applied to two schoolrooms which had been tightly sealed by means of weather-stripping against leakage from external sources, it was the subject of constant complaint from odors, lack of "freshness," and tendency to complaints of excessive heat and moisture.

Practical experience in ventilation work, however, has shown that recirculation may be well used for heating all classes of buildings prior to the period of occupancy, and that in the case of buildings of loose construction or considerable air leakage, in buildings of limited occupancy, or in buildings in which the actual space occupied is relatively small in proportion to the total cubic contents of the building, recirculation may be safely used with assured freedom from the complaints found in the case of the commission's experimental rooms.

The studies relating to the circulation of air within the schoolroom were made in a specially equipped room at Public School 51, Bronx, New York City, in which the air could be passed through the room in all directions applicable to schoolroom ventilation. The best results were clearly indicated when the air was supplied near the ceiling at the end of the room, preferably near the outer wall, with the exhaust taken out through same wall, preferably near the inner wall.

While this report refers specifically to schoolroom ventilation, there is much of practical value therein which may be applied to the ventilation of other types of buildings, notably hospitals. There is every reason to believe that the window-ventilation method may, with success, be applied to the general ventilation of hospitals. With cross ventilation provided in the wards, the exhaust flues would not be required except, possibly, in large wards. The use of the windows in wards and private rooms for the admission of air, in combination with radiation and window deflectors, as described in the report, supplemented with the mechanical exhaust system customarily provided for toilets, serving-kitchens, and utility spaces generally may be adapted to the hospital with successful results in many cases.

Similarly the window method of ventilation will be found applicable to many offices and work spaces, but if the occupancy of such spaces is large, means of exhausting the warmed or vitiated air must be provided along the lines found successful in the schoolroom. Experience and skill must be exercised in the selection of the heating system, in the proportioning and placing of the radiation, and in the arrangement of the exhaust flues.

Practical suggestions concerning the essential features of the various ventilation systems studied are made in this report, which, as a whole, is well worthy of study by every architect and engineer.

The following quotation is from the conclusion of the commission's report:

"In final summary we may conclude that either window ventilation or plenum-fan ventilation—if the plant be properly designed and operated—yields generally satisfactory results from the standpoint of the air conditions in the average schoolroom. We have found it possible to maintain by either of these procedures air conditions in the schoolroom that would be considered satisfactory by all the ordinary physical tests and conditions which are reasonably comfortable and satisfactory to the occupants. The main difference lies in the fact that the air of the fan-ventilated room is likely to be about 2° F. higher and more uniform in temperature, and that the air movement in this method is considerably greater.

"We find that, on the whole, other things being equal, the window-ventilated room at 67° F. is somewhat more comfortable than the fan-ventilated room at 69° F.

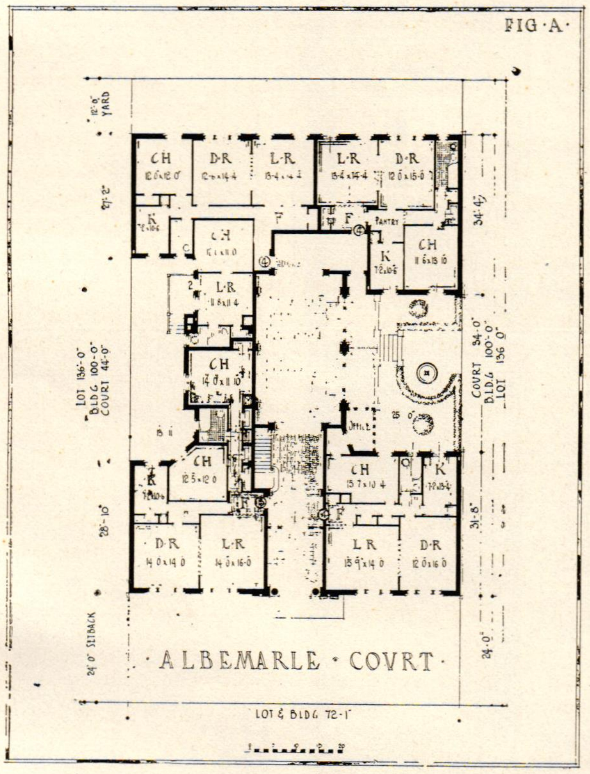
"It appears that 68° F. is a critical temperature as regards both comfort and susceptibility to respiratory disease, and the great advantage of window ventilation lies in the fact that the reduced air flow in the zone of occupancy permits this low temperature to be maintained."

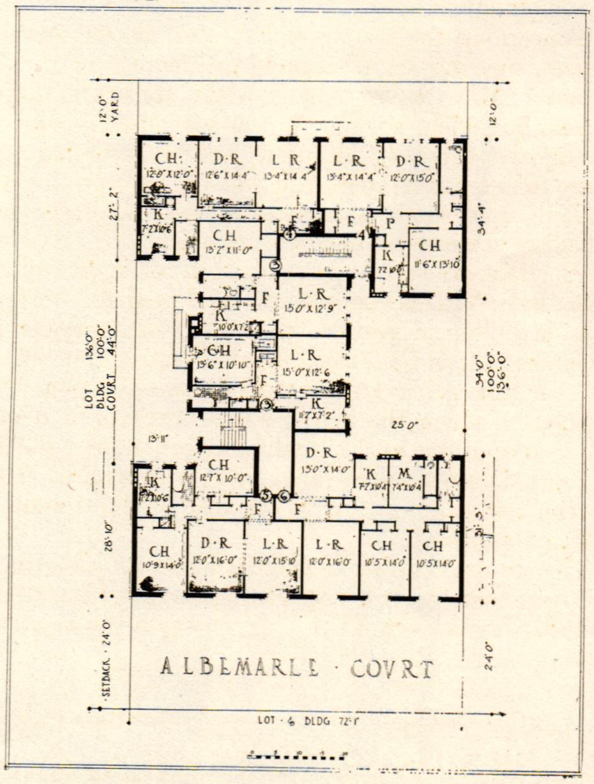
Increased Use of Metal Lath

THE rapidly increasing use of metal lath, due to its recognition as a fire and crack prevention medium, has put great pressure upon the industry for a reduction of the number of sizes, styles, varieties, and finishes.

Following the suggestion of Secretary of Commerce Hoover, the metal-lath manufacturers are preparing to cut the excess varieties out of their long list of metal-lath products, and reduce them to a minimum.

Mr. W. B. Turner, of the General Fireproofing Company, Youngstown, Ohio, is chairman of the industry committee on this matter, and Wharton Clay, commissioner of the Associated Metal Lath Manufacturers, is secretary.





ALBEMARLE COURT, BROOKLYN, N. Y. W. T. McCarthy, Architect.

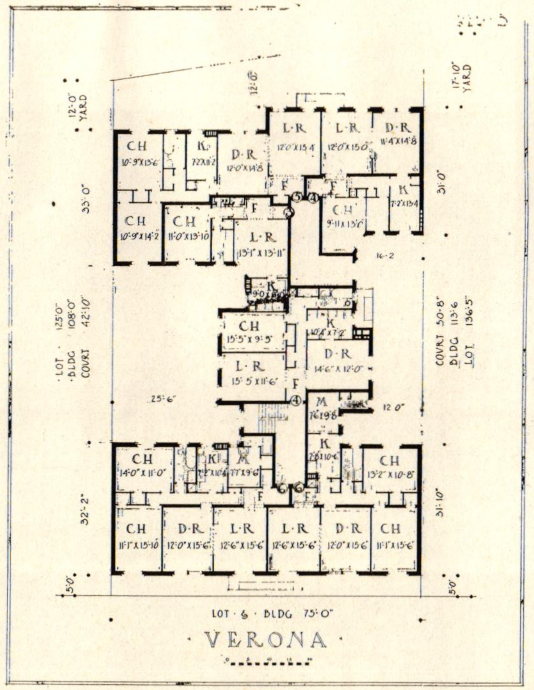
The two stairways and the sacrifice of three rooms on the court afford an opportunity to create a beautiful, well-lighted, and spacious reception-hall opening on a terrace in the large court, which, in this particular case, opens on the lawn of a private residence to the east.

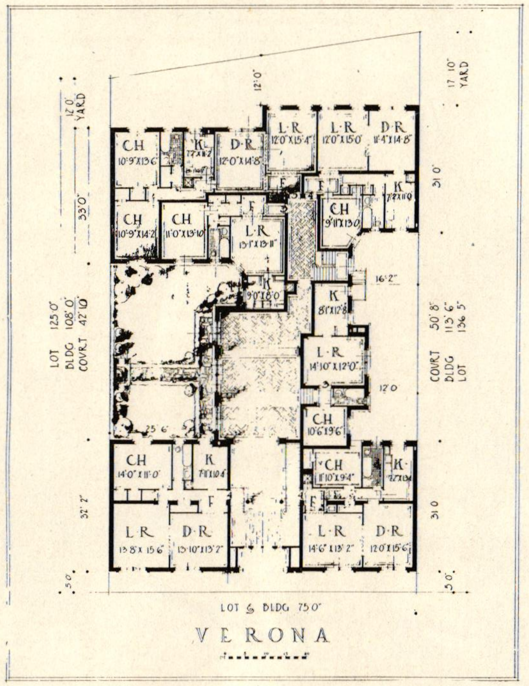
Two rooms opening on the smaller court and having no direct connection with any other part of the building are provided for the janitor instead of incurring the great expense of construction necessary to place an apartment for his use in the basement.

The setback restriction, while limiting the size of the building considerably, also adds materially to its appearance and the desirability of the front apartments, as it is located on one of Brooklyn's finest residence streets.

Changes in design and a poor selection of front brick by the builder detract considerably from its appearance.

When this building was completed in 1914 a rental of from $12 to $14 per room was obtained.





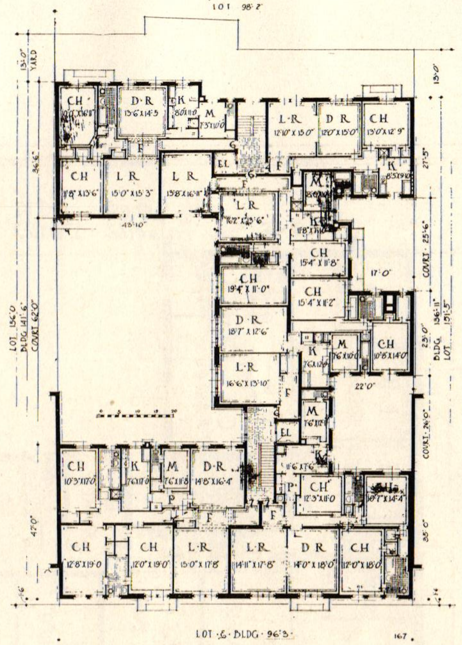
VERONA APARTMENTS, BROOKLYN, N. Y.

W. T. McCarthy, Architect.

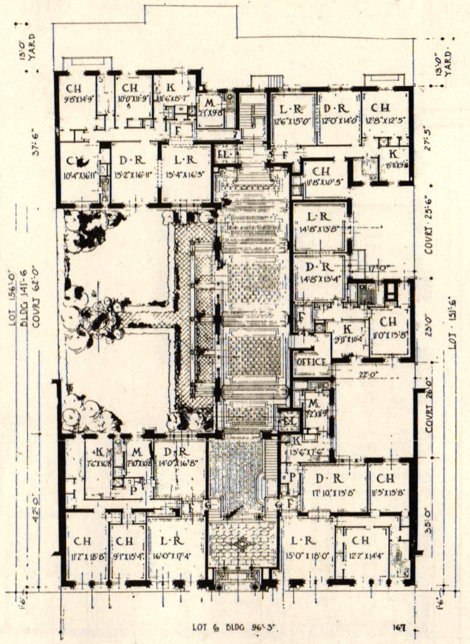
An example of the two-stair-hall idea adapted to comparatively large unit on an interior plot.

Note entrance to apartments direct from stair-hall to foyer in every case. In no case does a person entering an apartment have to pass the door to any room; in other words, the privacy of the family as to dining-rooms, bedrooms and bathrooms is as great as in the average private house.

Note also that there is no apartment entirely on the smaller court, as would be the case with one stair-hall, thus making it possible to cut the size of the small court to a minimum and to make the large court a maximum in size; also, the splendid lighting and ventilation of the inside or court apartments through from court to court and of the front and rear apartments from street to yard and courts.



LIVINGSTON · COVRT ·



LIVINGSTON · COVRT ·

LIVINGSTON COURT, BROOKLYN, N. Y.

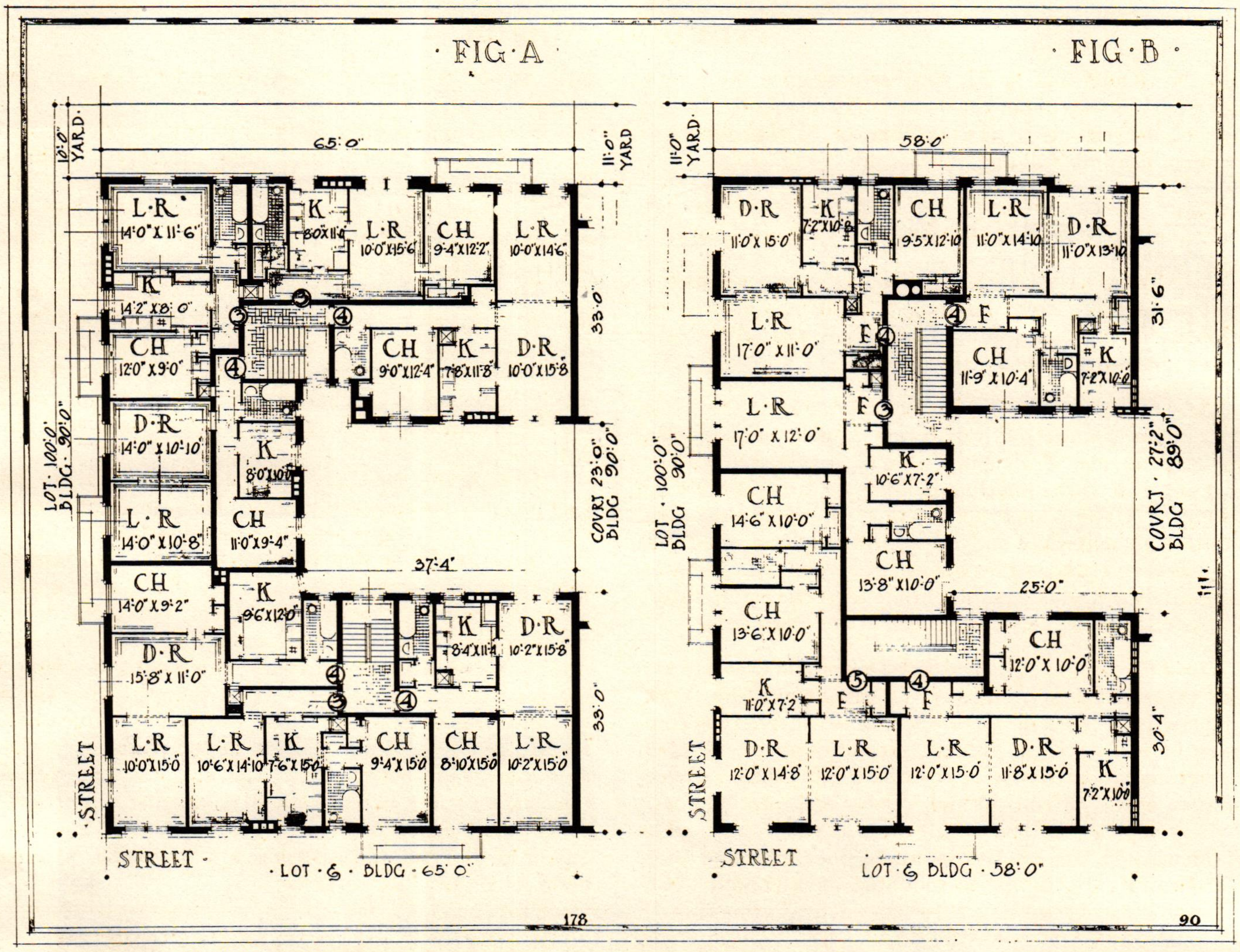
W. T. McCarthy, Architect.

It seems unnecessary to comment on the first and typical floor plans except to call attention to the fact that absolute privacy is obtained for the members of the family from even the maid's room and kitchen as well as from the foyer and living-rooms. There are separate shower-baths in the large apartments and an abundance of large closets throughout.

The ground-floor reception-hall opens through large glass doors to a terrace overlooking a garden in the court as well as the park next door, making a very attractive and airy place in the summer and a bright and cheery one in winter.

It will be noticed that there are no laundry-tubs in any of the kitchens, this for the reason that a large, bright laundry is provided in the basement with batteries of tubs, washing-machines, electric ironing apparatus, and gas dryers.

Another desirable feature of the two stair-halls and two elevators is that fewer apartments open on each stair-hall, making for more privacy.



25 · ROOMS · 2ND 3RD 4TH · FLRS ·
STORES · & · 16 · ROOMS · 1ST · FLR ·
TOTAL · NO · OF · ROOMS · 91 ·
· 77.8 % OCCUPIED ·

20 · ROOMS · 2ND · 3RD · 4TH FLRS
17 · ROOMS · ON · 1ST FLOOR ·
TOTAL · NO · OF · ROOMS 77 ·

TWO TYPES OF LOW-RENT APARTMENTS. W. T. McCarthy, Architect.

FIG. A

One of the best types of cheap steam-heated apartments, four stories high, six families per floor, with stores and apartments on the ground floor.

Note that there are no inside apartments; that is, there are no apartments entirely on the court.

This is made possible by the use of two stair-halls, an arrangement which is usually impracticable in similar units than those shown in Figs. A and B.

It was with the utmost difficulty that the first local builders were persuaded to adopt this arrangement, the only thought in their minds being what seemed to them the tremendous cost of the additional stairway with its tile, mason, and steel work. This arrangement, however, as can be readily seen, reduces the cubic contents of the building, eliminates the long, dark, or private halls, makes a more compact arrangement of apartments, increases the light and particularly the ventilation through each apartment from street to court.

FIG. B

A good type of medium-priced steam-heated apartment.

Note direct entrance from stair-halls to foyers, also privacy of bedrooms and bathrooms.

Good closet space and compactness of arrangement.

Fire Prevention.—Two hundred and thirty thousand lives were lost in the United States in fires during the last ten years. Sixteen thousand five hundred $4,000 homes, or their equivalent, burn to the ground every twelve months. Carefulness and *built-in* fire protection is essential. Ninety-six per cent of dwelling fires start inside the house. By protecting the vulnerable points with *metal lath,* fire can be stopped where it is most likely to start. It adds only 1 per cent to the total cost. The "five vulnerable points" are: 1. Bearing partitions and walls. 2. Ceilings under inhabited floors, especially over heating-plants and coal-bins. 3. Chimney-breasts around flues and back of ranges. 4. Stair walls and under stairs. 5. Exterior walls.

The Monarch Metal Products Co. are sending out an illustrated pamphlet dealing with Monarch Metal Weather Strips. It is a time of year when such matters need careful consideration.

Association of "Electragists"

At the recent annual convention of the Association of Electrical Contractors and Dealers it was voted to change the title of the organization as above.

This was due to the desire to incorporate in the title the trademarked word "electragist," meaning a member using high standards of practice. The new title also gives recognition to the large number of members located outside of the United States.

Announcements

M. Nirdlinger and R. M. Marlier announce the formation of a partnership under the name of Nirdlinger & Marlier, architects, succeeding to the practice of M. Nirdlinger & Associates, Empire Building, Pittsburgh.

Horace Greeley Knapp, architect, announces a new business address at 5 West 16th Street, New York City.

The Milwaukee Corrugating Company are manufacturing a line of sheet-metal building specialties that are well worth careful consideration. They have special features that have met with wide approval.

The Central Estimating Bureau of America, the initial division of a commercial institution known as Universal Acme Engineering, Bridgeport, Conn., is prepared to render for any unit of the building industry and its clientèle the following services: Construction reports, appraisals, field accounting of materials and labor, investigation, consultation, general and subcontract quantity surveys and estimates. It also kindly requests manufacturers' descriptive literature and price-lists on all classes of construction materials.

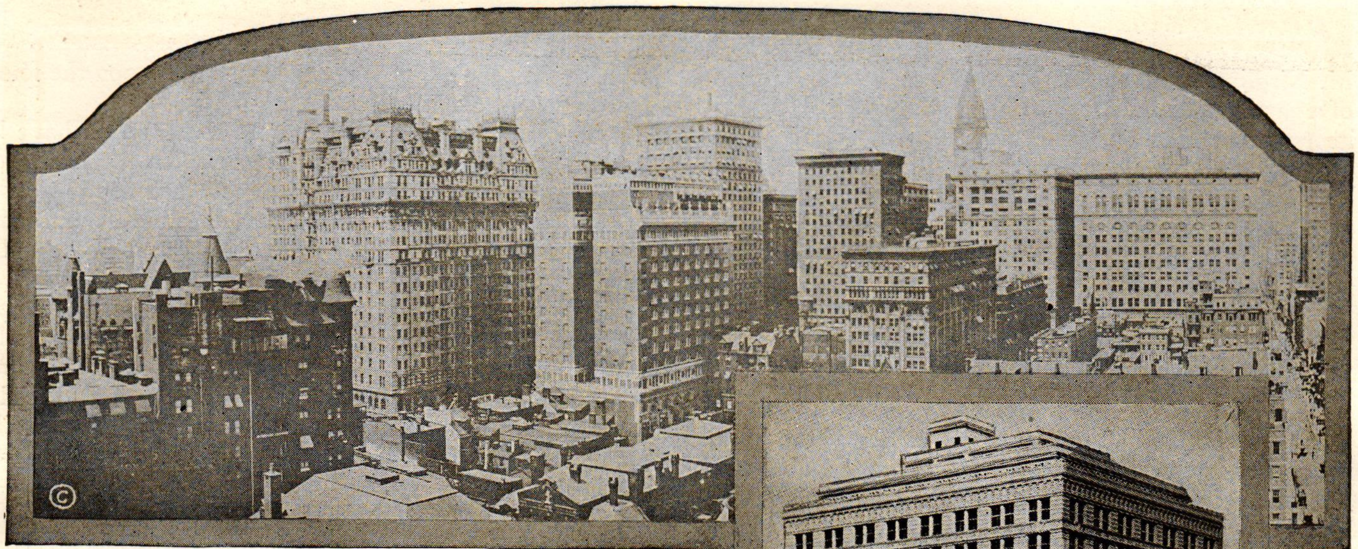
New Line of Small Vertical Belt-Driven Air-Compressors.—The Ingersoll-Rand Company, 11 Broadway, New York, announces a new line of small vertical belt-driven air-compressors known as Type Fifteen. In addition to the plain belt-drive design each size is built as a self-contained electric-motor outfit, driven through pinion and internal gears, or by employing the short belt-drive arrangement. The compressing end and electric motor of both gear and short belt-drive units are furnished mounted on a common sub-base, so that they are in no way dependent upon the foundation for correct alignment.

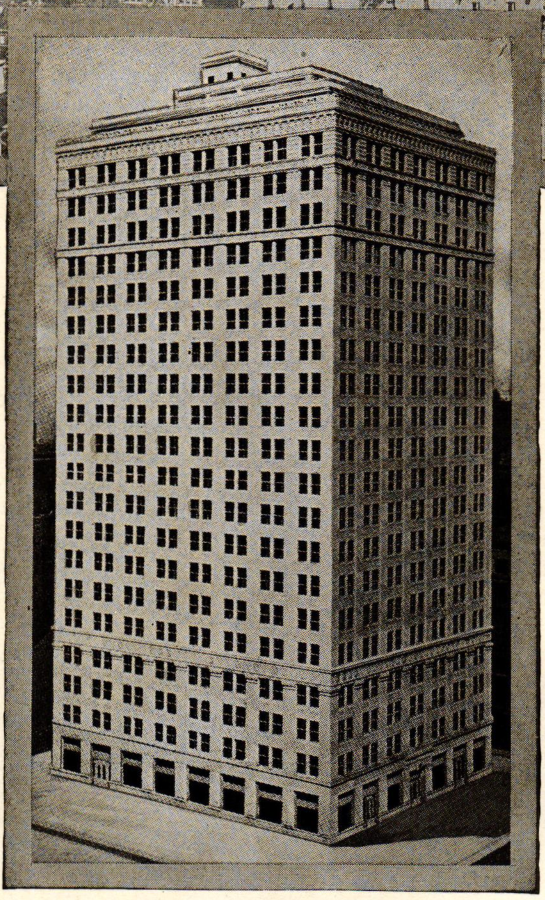
Several noteworthy features of construction have been incorporated, of which the "Constant-Level" Lubrication System is the most important. Others include the Constant Speed Unloader for plain belt-drive machines; the Centrifugal Unloader for start and stop control machines, and the increased size of the water reservoir cooling pot.

The lubrication of small vertical compressors employing the enclosed crank case and splash system has often been a source of concern wherever oil in the air is a serious menace. The tendency of the old system has been to feed too much, resulting in discharged air containing excess oil, or too little, causing scored cylinders, excess loads, and burned-out bearings.

The "Constant-Level" System used in Type Fifteen Compressors automatically maintains a constant level of oil, which insures the right amount being distributed to all parts.

As with the ordinary splash system, the base of the compressor forms an oil reservoir for the "Constant-Level" System. However, with this system, pet cocks determine the maximum and minimum amount of oil in the reservoir. Above this reservoir and directly underneath the connecting-rod is a constant-level pan. Oil is pumped from the reservoir into this constant-level pan through a unique oil-pump. Regardless of the amount of oil in the reservoir, so long as it is somewhere between the high and low level pet cocks, this system will function perfectly, insuring a constant level of oil in the pan. A projecting stem on the connecting-rod dips into this pan and distributes just a sufficient quantity of oil for proper lubrication.





ATLANTIC BUILDING
PHILADELPHIA, PA.

Joseph F. Kuntz, R. A., Architect
(The W. G. Wilkins Co.,
Pittsburgh, Pa.)

Rust-Proofing A Building

Philadelphia is another community on its way to becoming a "Brass pipe city". It is ceasing to experiment with substitutes.

It has reached the point where *rust-proofing* the building investment is recognized as being as important as fire-proofing.

In the Atlantic, an office building now under construction for the Atlantic Refining Company, all thought of any substitute for Copper or Brass was abandoned. Copper pipe is being used throughout the hot water system and Brass pipe for the cold water. The Copper tubing runs in size up to 4 inches and the Brass pipe up to 6 inches.

A total of 33,500 feet of Copper and Brass pipe is being installed in the Atlantic Building, not counting the thousands of couplings and fittings.

Copper is being used for all sheet metal work,—a total of about 15,000 lbs. of Copper sheet.

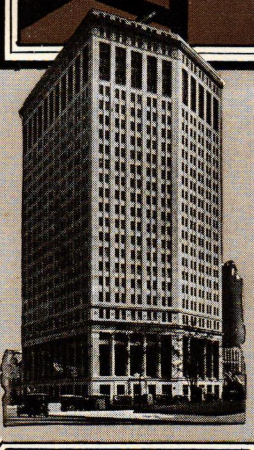
"Copper, Brass and Bronze are cheaper because you pay for them only ONCE."

COPPER & BRASS RESEARCH ASSOCIATION

25 Broadway - New York

Sizes and quantities of Copper and Brass pipe used in Atlantic Building:

COPPER PIPE		BRASS PIPE	
Diameter	Length	Diameter	Length
4"	1,200 ft.	6"	350 ft.
3"	850 ft.	4"	1,300 ft.
2"	2,000 ft.	3"	1,100 ft.
1¼"	1,800 ft.	2"	2,000 ft.
1"	1,200 ft.	1¼"	1,800 ft.
¾"	1,000 ft.	1"	1,800 ft.
½"	8,000 ft.	¾"	1,100 ft.
		½"	8,000 ft.



The First National Bank, Detroit
Architect, Albert Kahn Linoleum
laid by Universal Carpet Company

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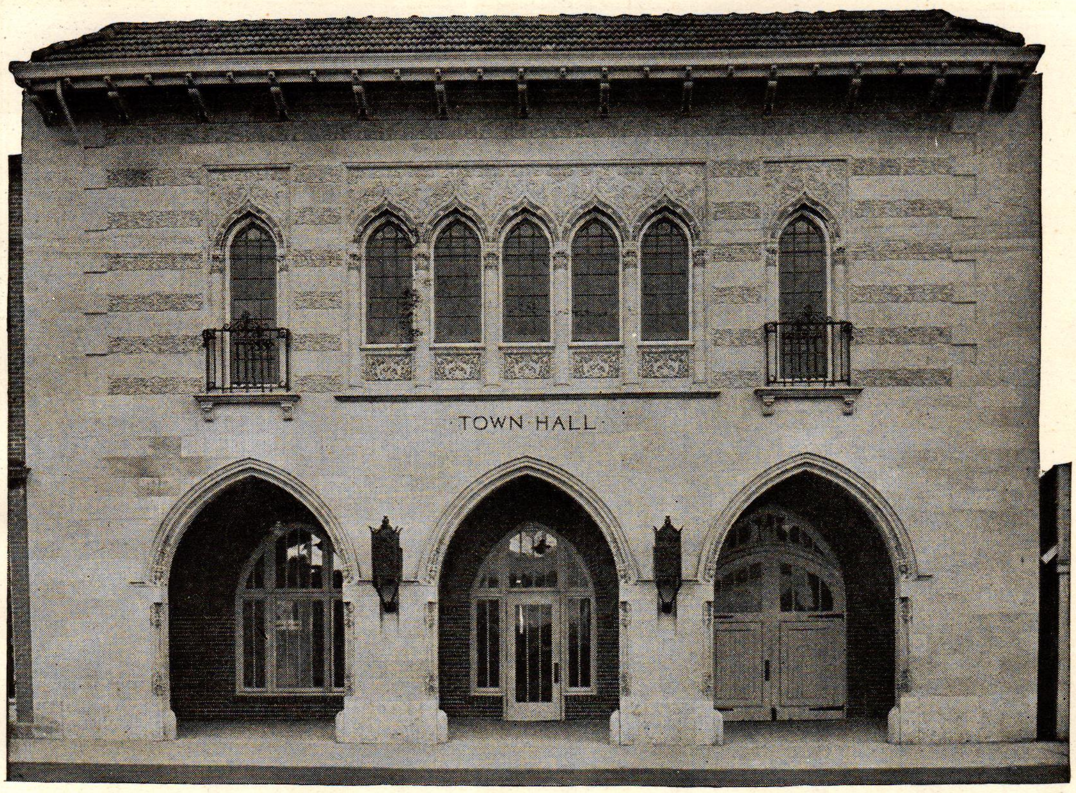

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J. B. BENEDICT
Architect

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De Rose & Cavalieri, *Architects*

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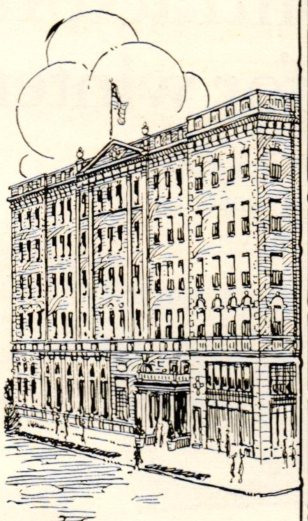
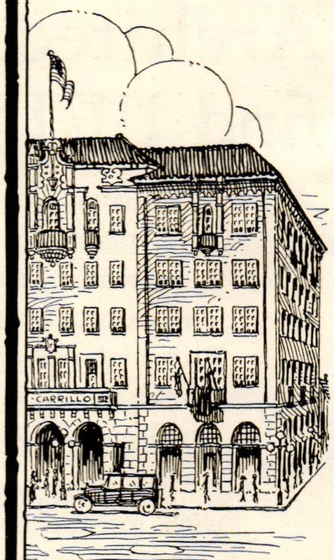


The New Hotel
New Britain. Conn.



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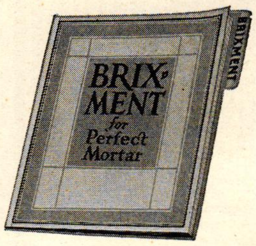

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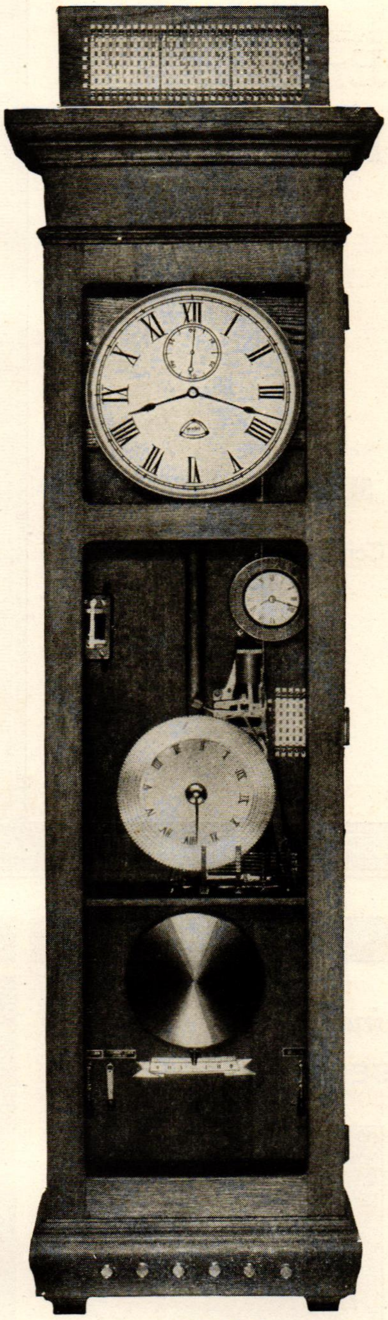

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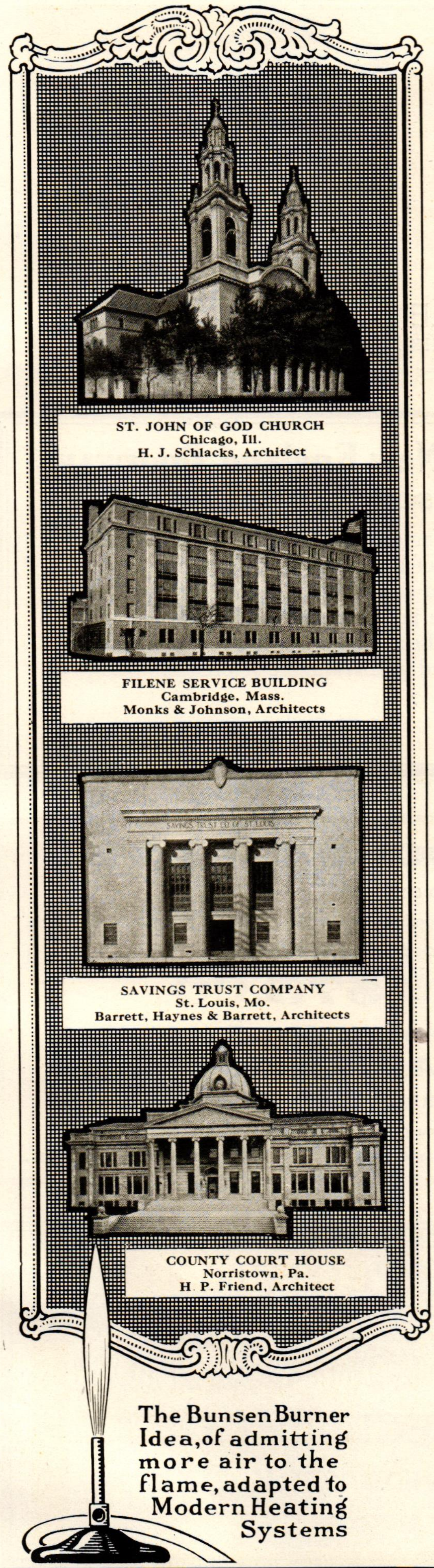

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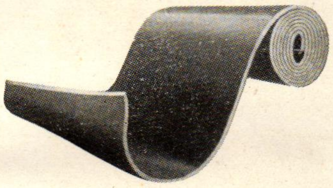

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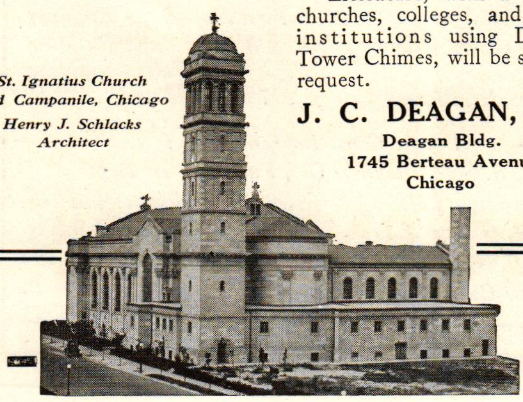

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Henry J. Schlacks Architect

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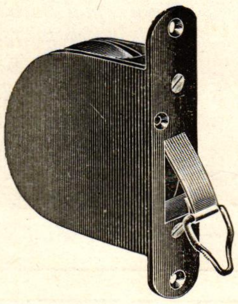

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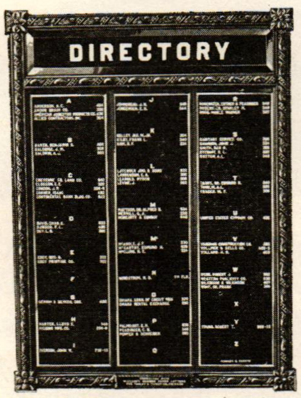

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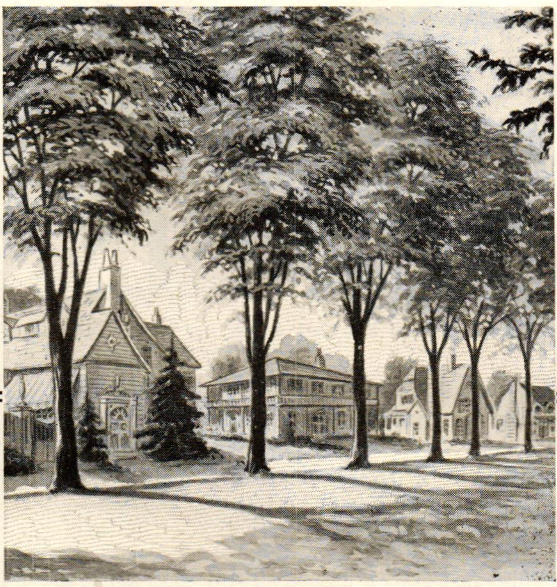
381-383 BROADWAY NEW YORK — 604 MISSION ST. SAN FRANCISCO



Kernerator Boulevard

In Cleveland, Detroit, Minneapolis, Baltimore, Milwaukee, and many other American cities, Kernerator Boulevard is the finest street in town. That is, it would be the finest and one of the longest if all the beautiful homes that have Kernerators could be placed on one street.

Each year the Kernerator becomes standard equipment with a rapidly increasing number of architects. Each year this modern system for disposing of household waste makes new friends among builders and home-owners. For there is no substitute for the Kernerator—no other equipment that affords its comfort and convenience, that so effectively promotes sanitation by eliminating the garbage-can.

The Kernerator consists of a brick incinerator, built into the base of the chimney when the house is erected, and a hopper door located in the flue on the first floor. It takes care of all household refuse *without cost*, for the refuse itself is the only fuel required. Non-combustibles are removed from the ashpit with the ashes.

For complete information, see page 2124, Sweet's 1922 Catalog

KERNER INCINERATOR COMPANY
1011 Chestnut Street — Milwaukee, Wis.

KERNERATOR
Built-in-the-Chimney
REG. U. S. PATENT OFFICE

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For general writing and sketching, 2B-B-HB-F-H
For clean fine lines, 2H-3H-4H-5H-6H
For delicate thin lines, 7H-8H-9H

Plain ends, per doz. $1.00
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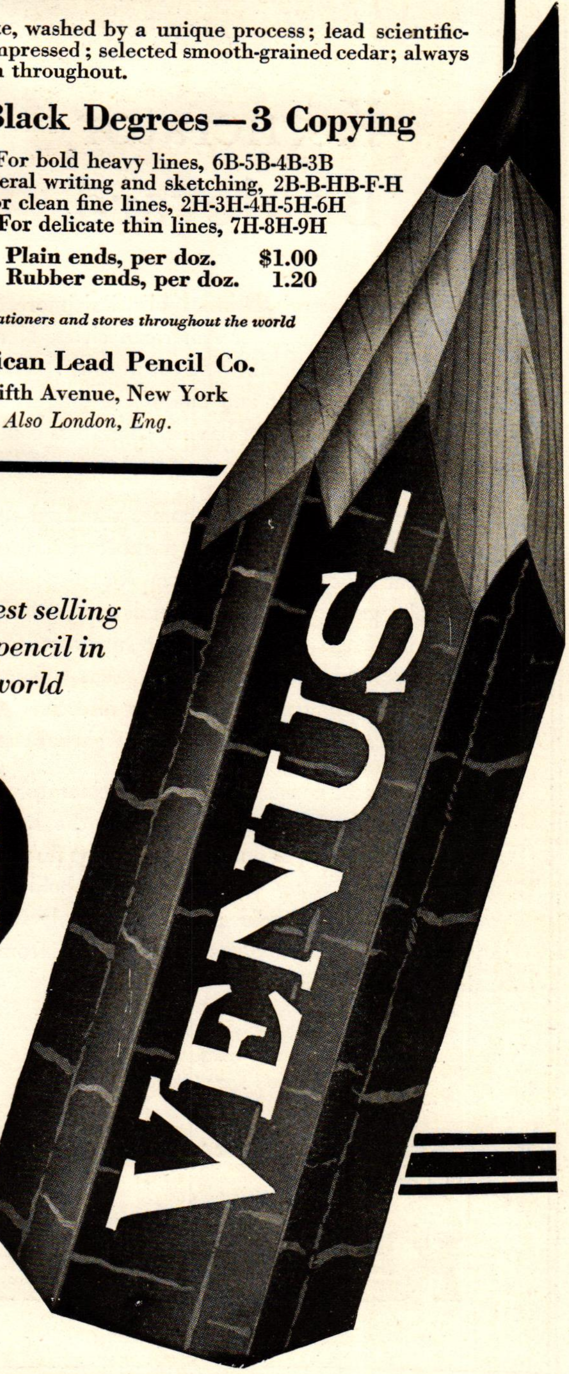
At stationers and stores throughout the world

American Lead Pencil Co.
232 Fifth Avenue, New York
Also London, Eng.

The largest selling quality pencil in the world



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The QUALITY Electric

Plate and Food Warmer

BUILT TO SPECIFICATION

EFFICIENT—NO FIRE HAZARD—ECONOMICAL

The Prometheus heating elements—no wire or ribbon used—insure that the temperature be so maintained that the food does not dry out and lose its taste.

THE PROMETHEUS ELECTRIC CO.
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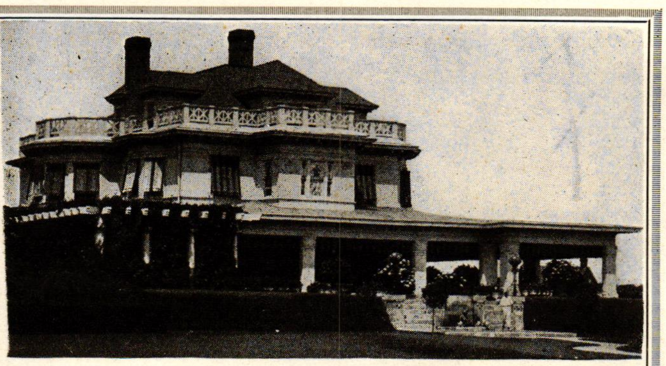

BOYLE'S BAYONNE JB&Co ROOF AND DECK CLOTH
REG. U. S. PAT. OFF.

BOYLE'S BAYONNE ROOF AND DECK CLOTH fits right in with the architects' plans for building houses. It has the proven ability of being waterproof and wearproof for roofs and floors of piazzas, sun-parlors, etc.

JOHN BOYLE & CO., Inc.

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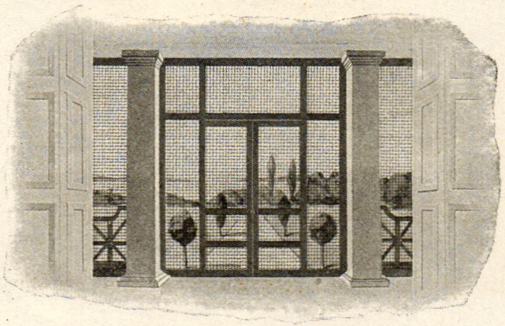
Branch: 202-204 Market Street, St. Louis



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Clinton Window Screen Cloth
you insure permanent satisfaction

CLINTON is made to wear as long as the building

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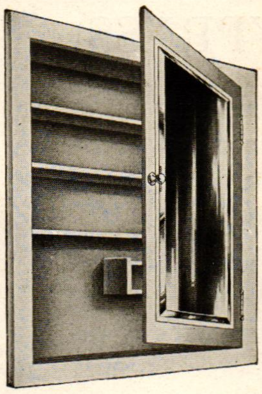

Medicine Cabinets *and* Lavatory Mirrors

meet the demand for better-than-wood cabinets and wood-framed mirrors, and at reasonable prices.

The highest grade of materials and workmanship go into these goods—polished plate glass mirrors, nickeled brass hardware, steel or glass shelves, and the whole, inside and out, finished in beautiful baked white enamel, guaranteed to be everlasting.

Look for this mark:

HESS TRADE-MARK CHICAGO

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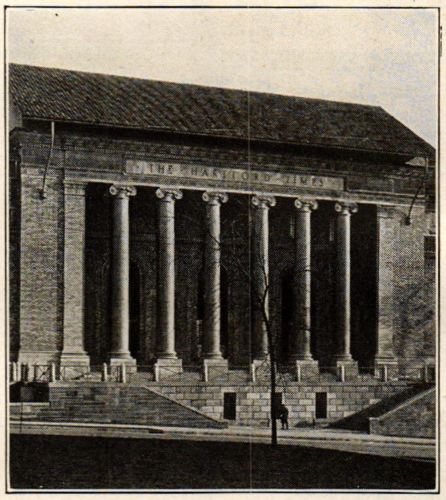
Sweet's Index, page 1470

HESS WARMING & VENTILATING CO.
1224 TACOMA BLDG., CHICAGO
Makers of HESS WELDED STEEL FURNACES

Granite – The Noblest of Building Stone



Entrance of the new Hartford Times Building, Hartford, Conn. Donn Barber, Architect

From Church to Print Shop

Donn Barber's foresight has preserved for us all the genius of Stanford White by his happy thought for the granite columns of Dr. Parkhurst's church.
Having for years made that church a show place of New York they now beautify a notable print shop—The Hartford Times.
None but the noblest of building stone would have the intrinsic worth to make such a costly move justifiable.
For those of you who are interested in the subject of architectural granite, we have a most interesting booklet. Send for it now.

National Building Granite Quarries Association, Inc.
31 State Street, Boston, Mass.
H. H. Sherman, *Secretary*

GRANITE

Ventilighter SYSTEM

LIGHT, AIR, NO GLARE—METAL FRAMES—CLOTH VANES

Ventilighter installed in Class Room of a Nautical College

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SCIENTIFIC SHADING for

PUBLIC BUILDINGS
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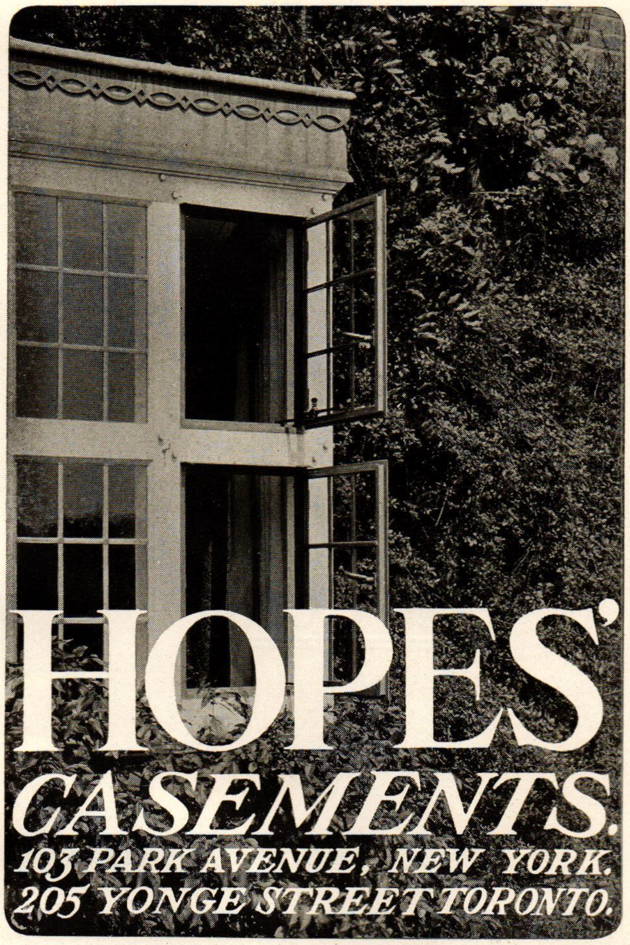
SKYLIGHTS, WINDOWS, SLEEPING-PORCHES

Designed to regulate and control light—eliminate offensive solar glare and heat without loss of light or ventilation

Correspondence on existing shading problems invited

Simon Ventilighter Co. inc.

101 Park Avenue — New York City



DAHLSTROM

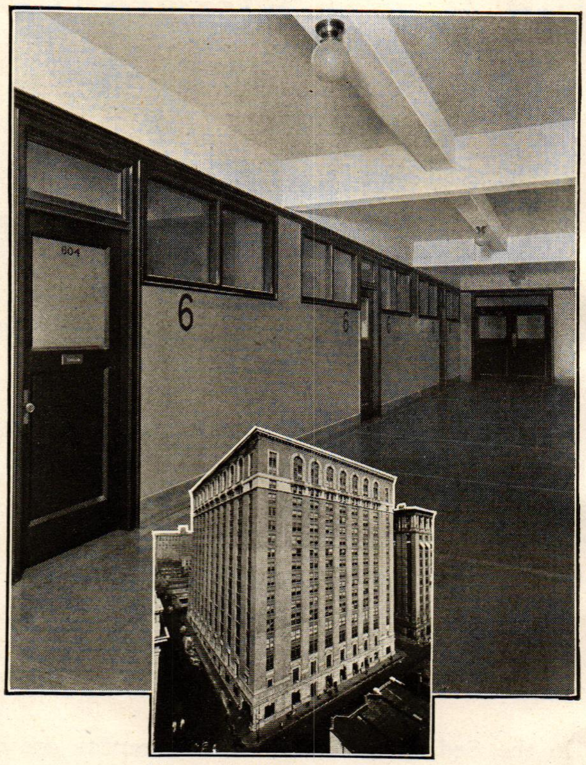


Illustration of Dahlstrom Borrowed Lights and Exterior Mail Service Building, New York City

THE USE OF BORROWED LIGHTS

Borrowed lights for a building simply mean what the name implies. They are used for a purpose, either to help light a corridor from outside rooms or to light inside rooms from light wells, or inside rooms.

Using them from wood adds an additional fire hazard, but using them from metal adds another fireproof member to a building. They are also neat and easily kept clean when manufactured and finished according to Dahlstrom standards.

DAHLSTROM METALLIC DOOR CO.
439 BUFFALO STREET, JAMESTOWN, NEW YORK

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25 Broadway	19 So. La Salle Street	1331 Dime Bank Bldg.

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DAHLSTROM PATENT DOOR ARTISTIC EVERLASTING SANITARY FIREPROOF

How to Secure Satisfactory Dumb Waiters and Hand Power Elevators

CHAPTER I

1. To secure satisfactory results from the installation of hand power elevators or dumb waiters, three things are essential: (1) A good outfit (in design, workmanship, and material). (2) An outfit appropriate to the individual conditions and requirements. (3) Proper installation.

2. A suitable outfit of good construction may be unsatisfactory if poorly installed. A good outfit, well installed, may be unsatisfactory if unsuited in type to the conditions and requirements. And naturally a poor outfit in design, or material, or workmanship, cannot be expected to give satisfactory service even if in general arrangement it is suitable and has been properly installed.

3. In the Sedgwick catalog various outfits are described more or less thoroughly, but in only a very general way has any effort been made to point out the various purposes for which each outfit is best suited.

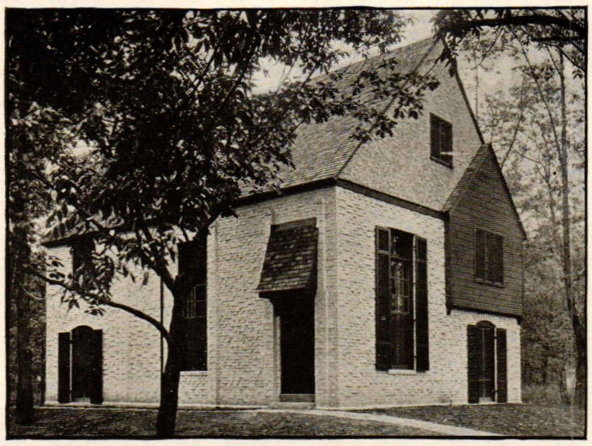
4. Any lack of definiteness in this respect is not to be construed as a lack of willingness on our part to aid in the selection of that particular outfit which will give better results than any other, but it is because we have studied this matter so exhaustively and the Sedgwick Line is so extensive that it has seemed better to advise those interested to consult us and get our advice wherever there is the slightest doubt as to the type or size of the outfit to be installed.

5. In addition to the outfits illustrated in the catalog, we have hundreds of drawings showing outfits designed to meet special conditions and requirements, and, therefore, it is just as easy and no more expensive for us to furnish just the right outfit for each job as it is to furnish anything else if the customer will take us into his confidence and tell us just what he wishes to accomplish.

(Continued next month)

SEDGWICK MACHINE WORKS

140 West 15th Street **New York, N. Y.**



Clark & Walcott, Architects, Chicago

Unique Small Houses

Chicago architects are producing many unusual small houses, of which the above is a striking example, especially in its original color-scheme, which is as follows:

WALLS: Common Chicago brick, laid rough, finished with two coats of Cabot's Old Virginia White.

GABLES: Stucco finished with Cabot's Old Virginia White, and wood stained with Cabot's Creosote Stain, black.

ROOFS: Shingles stained in mottled coloring effect with Cabot's Creosote Stains.

Full information sent on request

SAMUEL CABOT, INC. Manufacturing Chemists **BOSTON, MASS.**

342 Madison Ave., NEW YORK 24 West Kinzie St., CHICAGO
525 Market St., SAN FRANCISCO 331 E. Fourth St., LOS ANGELES

Cabot's Creosote Stains, Old Virginia White and Tints, Double White, Stucco and Brick Stains, Conservo Wood Preservative, etc.

THE CUTLER MAIL CHUTE

Should be specified by name. Use Model F Standard Equipment for best value. Estimates can always be had in advance when desired.

CUTLER MAIL CHUTE CO.
OFFICES AND FACTORY
ROCHESTER, N. Y.

Equitable Building, New York
E. R. GRAHAM, Architect

For the Entrance Corridors of Office Buildings Use

FRINK REFLECTORS

The corridors of the more important office buildings can generally be successfully lighted by concealed specially designed cove reflectors. May we emphasize the advisability of getting in touch with our Engineering Department before the details are too far developed?

Some prominent New York installations are:

Equitable Building
Heckscher Building
Woolworth Building
Singer Building
American Surety Building

"Specify Frink Reflectors"

I. P. FRINK, Inc.

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San Francisco, Cal. 77 O'Farrell St.
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Boston, Mass. 161 Summer St.
Cleveland, Ohio 336 The Arcade
Cincinnati, Ohio 17 Greenwood Bldg.
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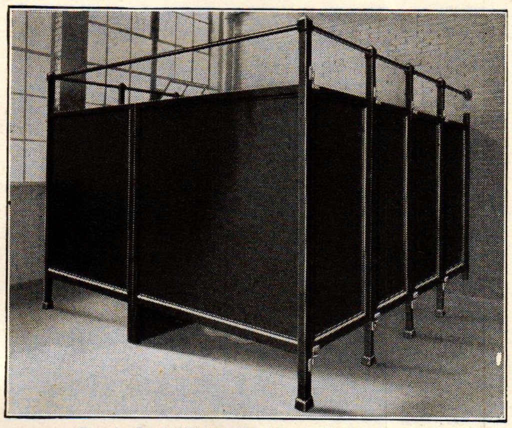
64 Belair Ave., Montreal



For the Real Silk Hosiery Co., Indianapolis, Ind.
Lockwood, Greene & Co., Engineers

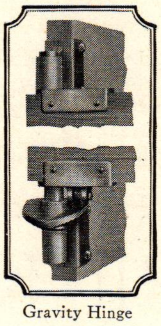
An Exceptional Hinge

No. 2 of a Series on "How to Judge Metal Partitions"

REGARDLESS of all the other fine Sanymetal qualities, there are many architects who will specify nothing but Sanymetal Toilet Partitions *simply on account of the hinges.* Sanymetal Gravity Roller Hinges—patented—are everywhere accepted as the finest toilet hinge made. That's because they are springless, simple, wear-and-fool-proof. They work from the force of gravity and unfailingly compel the swing doors to stand open or closed, as desired, when the toilet is unoccupied. Their roller action is smooth and sure. They make spring replacement a forgotten nuisance.

Other Sanymetal features are: unusually rigid installation, exclusive use of Armco Ingot Iron Sheets, high-grade baked enamel finish, sanitary water-shedding base shoe, slant-lip partition mold, new door with molded stile, electro-zinc rust-proofing of all hardware, unit section design, with or without doors, adaptable to any arrangement. Sanymetal is also made for urinals, shower and dressing-rooms, and toilet wainscot. Write today for new Catalog No. 5.

Makers of Sanymetal Office and Factory Partitions

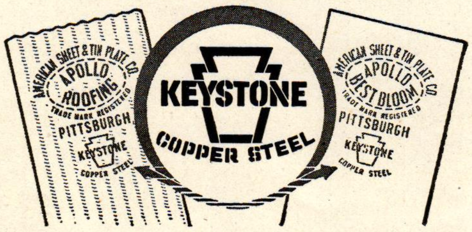


Gravity Hinge

THE SANYMETAL PRODUCTS CO.
985 E. 64th Street **Cleveland, O.**

Sanymetal
TRADE MARK U.S.REG.
Toilet and Office Partitions

Safeguard your clients' property from fire and lightning—and add *security* to lasting service. Be particular to specify Keystone Copper Steel



BLACK AND GALVANIZED

SHEETS

and Roofing Tin Plates

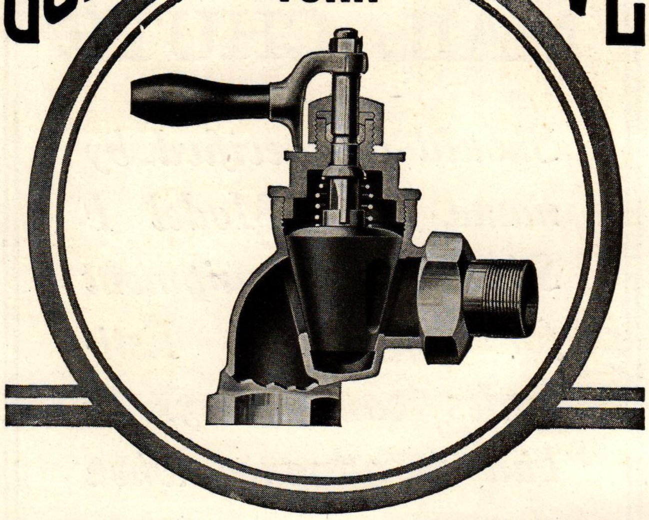
Keystone Copper Steel makes better and safer roofs and more lasting sheet metal work. This alloy assures greatest wear and *rust resistance* for roofing, siding, spouting, gutters, eaves trough and similar uses. Look for the Keystone added to regular brands.

APOLLO-KEYSTONE Galvanized Sheets will give increased wear and permanence to the sheet metal work on your buildings. Demand Keystone quality for superior rust-resistance.

KEYSTONE COPPER STEEL Roofing Tin Plates make clean, safe, attractive and satisfactory roofs. Supplied in grades up to 40 pounds coating— specially adapted to residences and public buildings. Metal roofs may be painted to harmonize with the color scheme of the building—an important feature which is often overlooked. Keystone quality products are sold by leading metal merchants, and are used by first-class roofers and sheet metal workers. Send for our booklet, "Copper—Its Effect Upon Steel for Roofing Tin."

AMERICAN SHEET AND TIN PLATE COMPANY, Pittsburgh, Pa., U. S. A.

GORTON QUARTER TURN VALVE



A Quarter Turn of the Wrist Opens or Closes this Valve

A Packing Lock Stem, with Ground Shoulder seating in bonnet insures a Tight Valve that Stays Tight. Send for Catalogue showing why.

GORTON & LIDGERWOOD COMPANY
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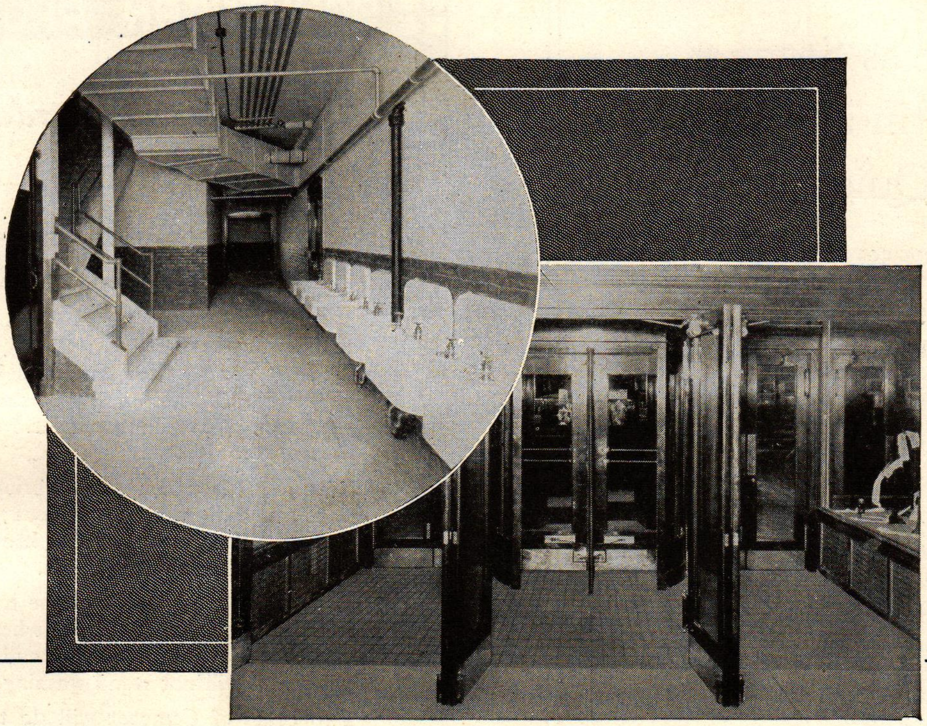
Fisher Building, Chicago, Illinois



© The D. T. E. Co., Inc., 1923

Reproduction from a painting in oil, by Chas. A. Wilimovsky, of Arbor Lodge, Nebraska City, Neb., home of the late J. Sterling Morton, founder of Arbor Day. The trees on this historic place were treated by Davey Tree Surgeons

How should you choose your Tree Surgeons?

ASSUMING that you are an average tree-owner, you have neither the time nor the desire to study in detail the technique and science of saving trees. You have no means of knowing Tree Surgery values, either in correct methods or reliable men. Therefore you must buy Tree Surgery service on faith.

Twenty-two years ago John Davey published his first book, "The Tree Doctor." Then began the slow and conscientious building of the Davey organization. In those early years the business was measured in hundreds and thousands of dollars. In 1922 the business amounted to one million dollars. During the past twenty years more than eighteen thousand clients have been served—more than four hundred thousand trees have been treated and saved. During the same period, many tree men have sprung up, lasted for awhile and disappeared. The Davey organization is the only concern that has endured and grown steadily and proven its inbred merit. The law of cause and effect makes this success significant.

The Davey organization is the one safe place to go. You do not need to know anything about trees or Tree Surgery values. Every Davey Tree Surgeon operates according to fixed high standards and under strict discipline—you could not hire or persuade him to give anything but standard Davey Service.

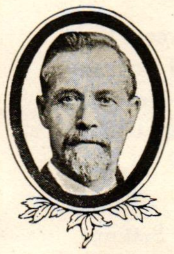
Davey Tree Surgeons are near you—if you live between Boston and Kansas City or in California. Write or wire nearest office for examination of your trees without cost or obligation.

THE DAVEY TREE EXPERT CO., Inc., 3002 Elm Street, Kent, Ohio

Branch offices with telephone connections: New York, Astor Trust Building, Fifth Avenue and 42nd Street; Boston, Massachusetts Trust Building; Philadelphia, Land Title Building; Baltimore, American Building; Pittsburgh, 331 Fourth Avenue; Buffalo, 110 Franklin Street; Cleveland, Hippodrome Building; Detroit, General Motors Building; Cincinnati, Mercantile Library Building; Chicago, Westminster Building; St. Louis, Arcade Building; Kansas City, Scarritt Building; Los Angeles, Garland Building; Montreal, 252 Laugauchitere, West.

Among prominent places and persons served by Davey Tree Surgeons are the following:

OLIVER AMES
MORTIMER SCHIFF
S. DAVIES WARFIELD
MAUDE ADAMS
COLUMBUS COUNTRY CLUB
BATTLE CREEK SANITARIUM
STARK BROS. NURSERY CO.
KENTUCKY TROTTING HORSE BREEDERS' ASS'N

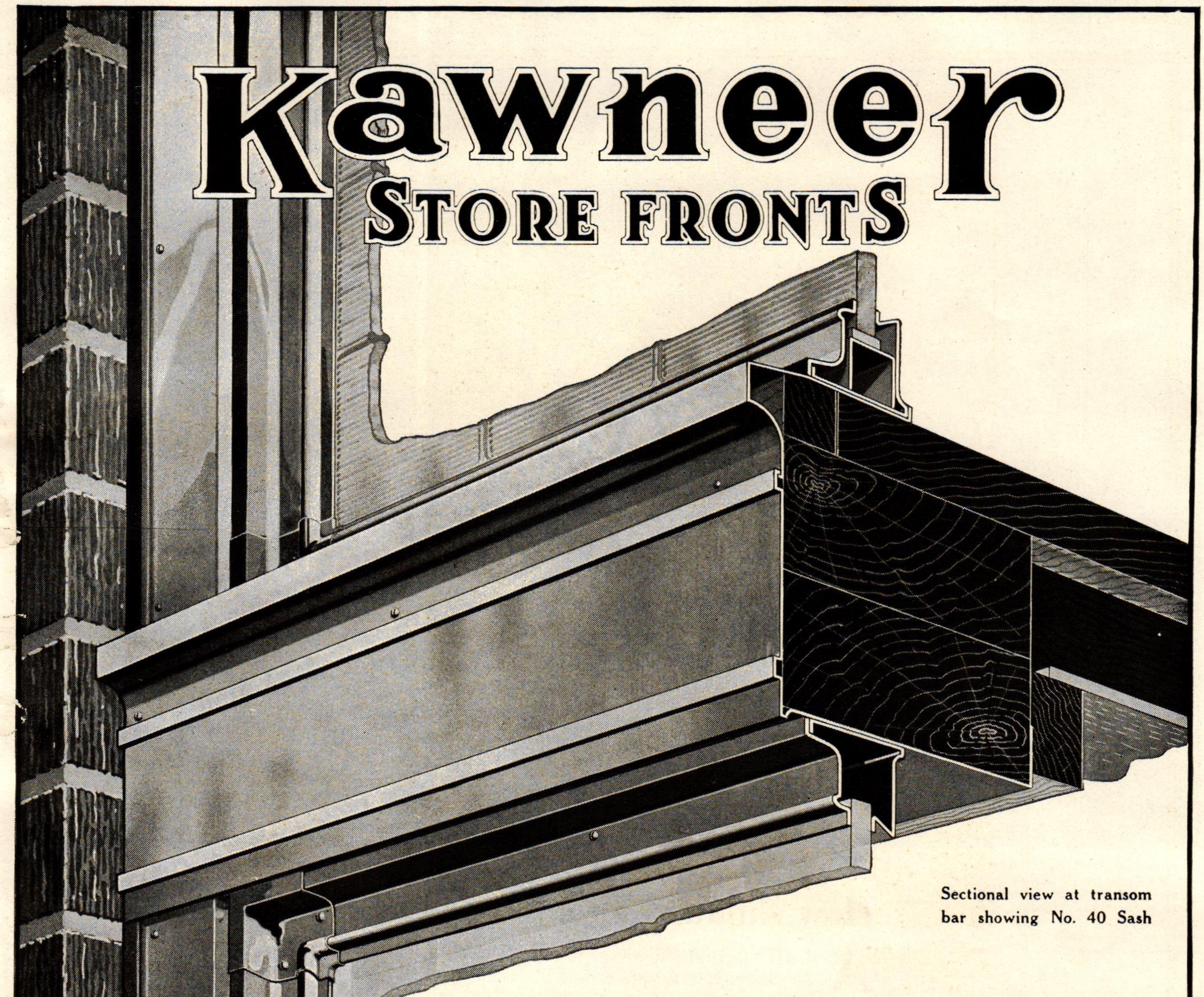


JOHN DAVEY
Father of Tree Surgery

DAVEY TREE SURGEONS

Every real Davey Tree Surgeon is in the employ of The Davey Tree Expert Co., Inc., and the public is cautioned against those falsely representing themselves. An agreement made with the Davey Company and not with an individual is certain evidence of genuineness. Protect yourself from impostors. If anyone solicits the care of your trees who is not directly in our employ, and claims to be a Davey man, write headquarters for his record. Save yourself from loss and your trees from harm

Kawneer
STORE FRONTS



Sectional view at transom bar showing No. 40 Sash

What Kawneer Resiliency Means in a Store Front

Plate Glass in all Kawneer Store fronts is Held Between the Sturdy but Resilient Grip of Two Spring Shaped, Solid Copper Members. This Resiliency, a patented and exclusive Feature of Kawneer Glass Settings, guarantees to the Merchant that his Show Windows will give him the UTMOST SERVICE—that his breakage will be reduced to a Minimum.

The service value of Kawneer Resilient Grip Glass Settings has proven to be satisfactory in more than 200,000 Kawneer Fronts in the most successful stores.

Our branch offices or sales agencies in all of the large cities will be pleased to co-operate with architects.

THE
KAWNEER
COMPANY
NILES MICHIGAN

SARGENT
HARDWARE

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Rochester, Minn.

Mr. F. H. Ellerbe, Architect
Raymer Hardware Co.
Hardware Contractors

CO-OPERATION WITH THE ARCHITECT

That Sargent Locks and Hardware give such general satisfaction is due not only to the care given to the mechanical construction of the locks and the details of the design, important as these points are, but it is the result of our efforts to work with the architect from the time the schedule is made up to the completion of the order and the installation of the goods.

SARGENT

LOCKS AND HARDWARE

equip and add to the value of buildings throughout the country and give satisfactory service for many years.

SARGENT & COMPANY

Manufacturers

NEW HAVEN, CONNECTICUT

New York Chicago

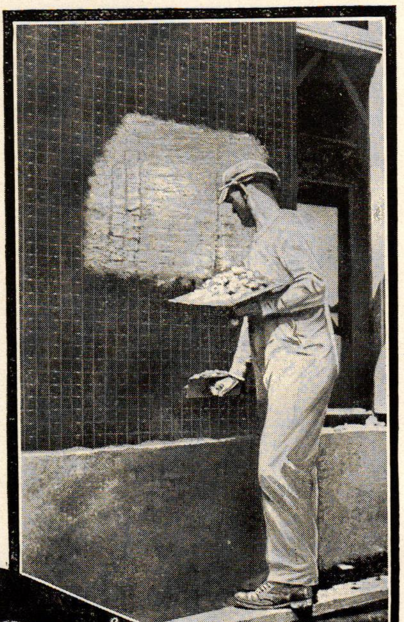
SARGENT products have created standards in hardware for more than sixty years

Why Stucco Must Be Reinforced

No material, unreinforced or unprotected, can long withstand the natural expansion and contraction (due to temperature changes) to which everything is subject. Wood is painted—shingles are creosoted—concrete is reinforced—steel is galvanized—foundations are waterproofed—bricks are burned—tin is coppered—silver is lacquered.

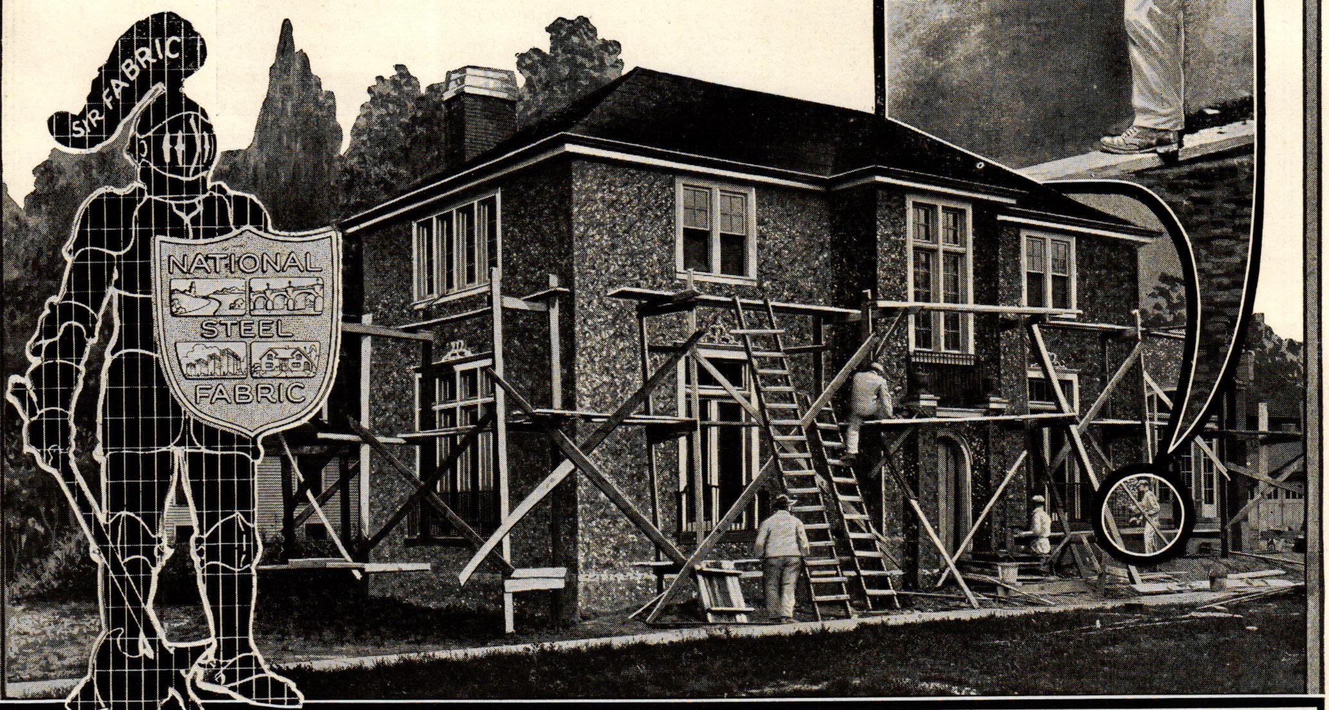
All this is done to REINFORCE or protect—to lengthen the natural life of the various materials.

And so it is that stucco must be REINFORCED, must be given the necessary tensile strength to withstand repeated expansion and contraction.



National Stucco-Plaster Reinforcement is a combined reinforcement and base for stucco exteriors. Its welded, GALVANIZED (non-rusting) steel wires (which develop a tensile strength of more than 60,000 pounds per square inch of steel) become thoroughly embedded in the stucco, and thereby assure truly reinforced, monolithic, crack-free walls. When properly applied and REINFORCED, Stucco improves with age, in looks and in structure.

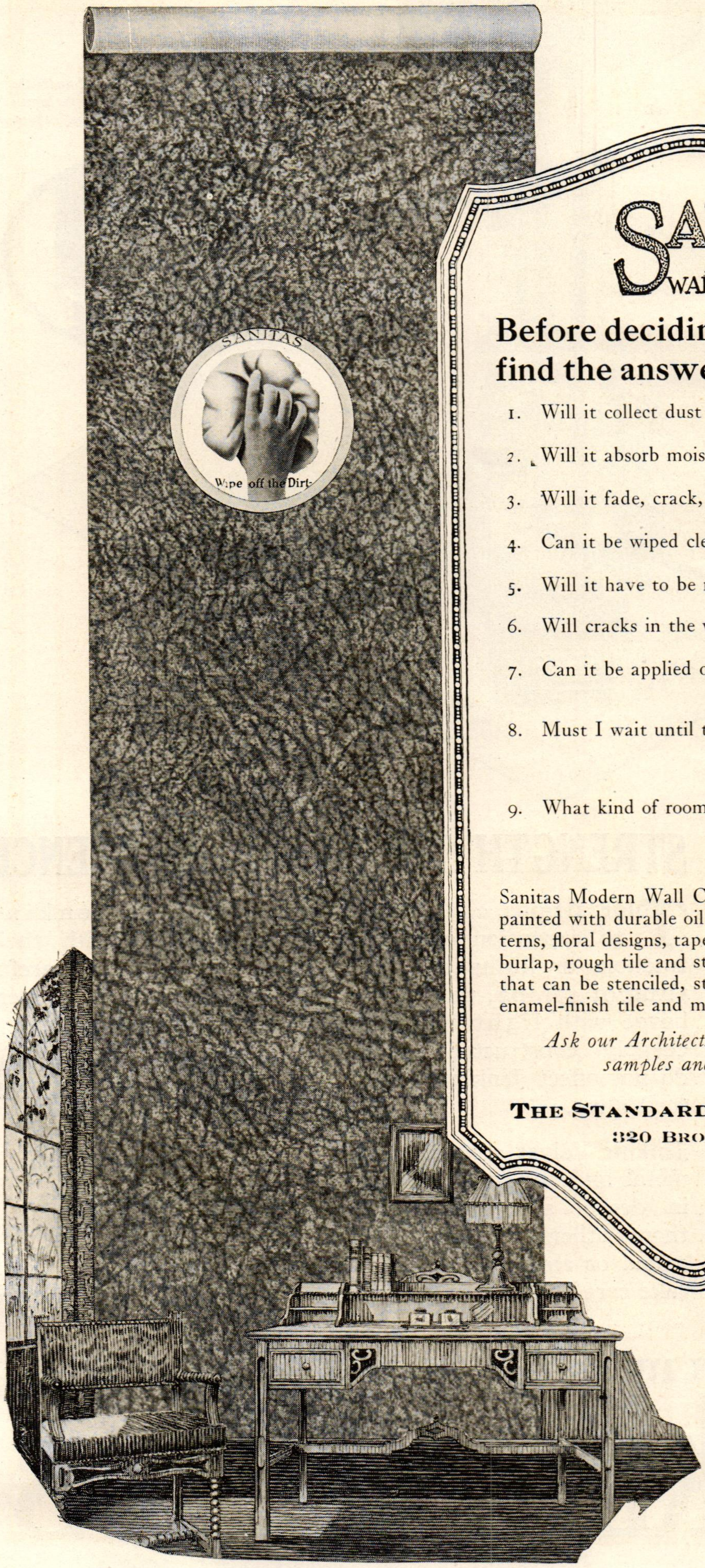
When building insist on the use of National Stucco-Plaster Reinforcement—aside from its reinforcing value, it is cheaper, in place. Carried in stock by local dealers. Write for our new catalogue.



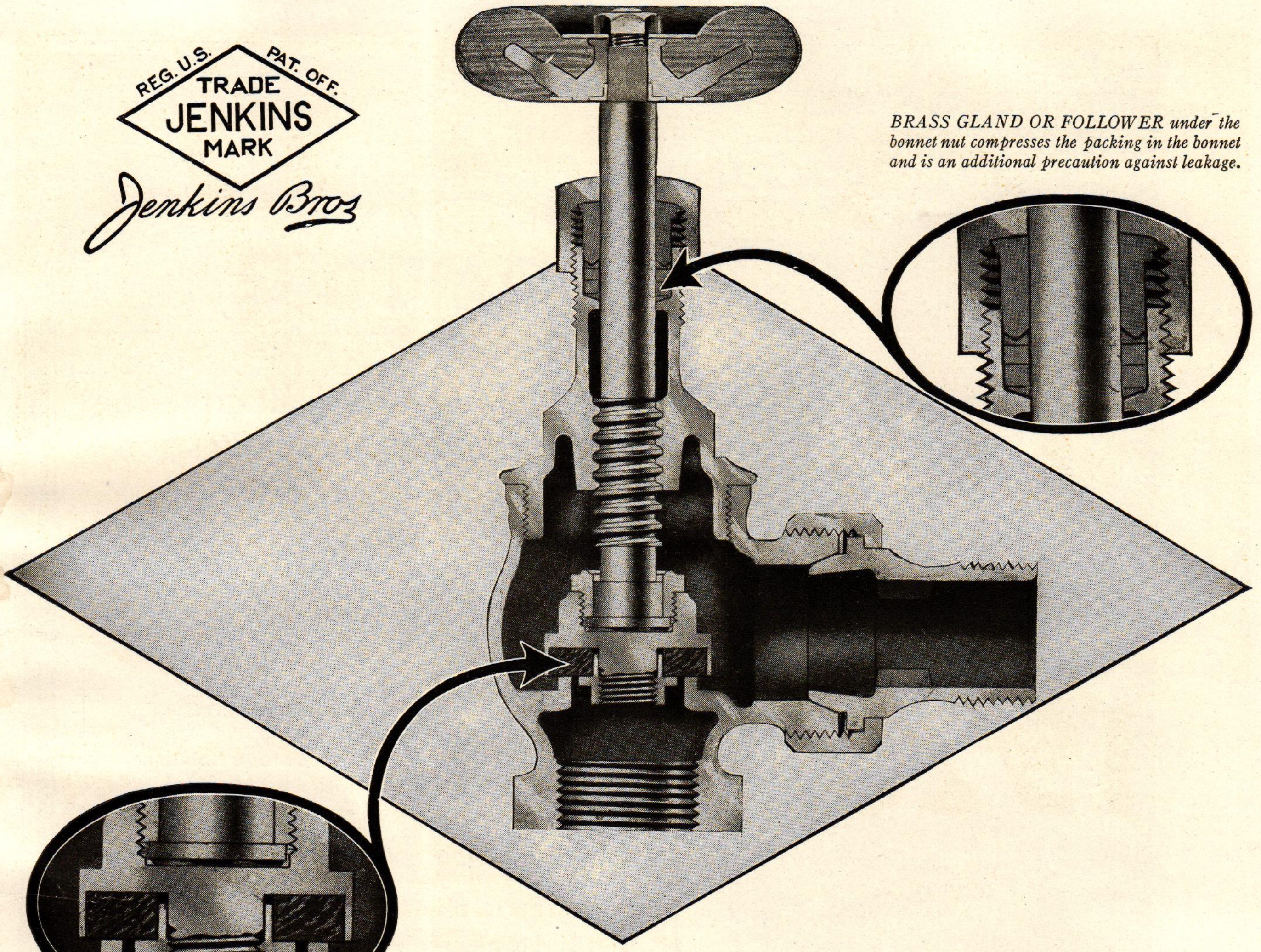
NATIONAL STEEL FABRIC CO

Subsidiary of PITTSBURGH STEEL CO

UNION ARCADE BUILDING PITTSBURGH, U.S.A


SANITAS
Wipe off the Dirt

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



BRASS GLAND OR FOLLOWER under the bonnet nut compresses the packing in the bonnet and is an additional precaution against leakage.

THE JENKINS RENEWABLE DISC of rubber composition, aside from always forming a perfect contact with the seat, takes up the wear of opening and closing.

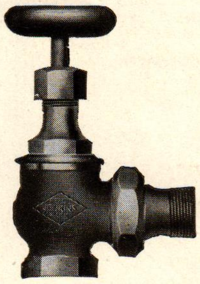


Fig. 168, Brass Radiator Angle Valve with union. Shown above in sectional view.

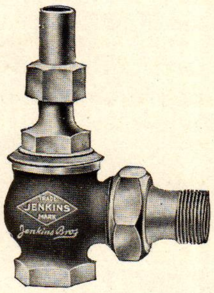


Fig. 170, Brass Radiator Angle Valve with Lock Shield.

STRENGTH that means PERMANENCE

THE strains, consequent to expansion and contraction, or lifting and settling of piping, that play havoc with light-weight, cheaply constructed valves do not affect Jenkins Radiator Valves.

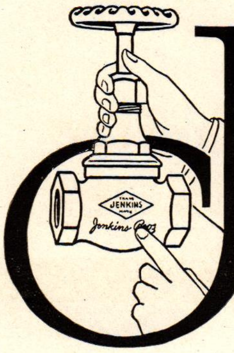
Jenkins Valves contain more metal and are much heavier in design and construction than others. They have added or reserve strength to take care of the strains.

The strength of Jenkins Valves, together with their proper design and careful manufacture, provide permanent, carefree service.

To make sure of the genuine, specify "JENKINS DIAMOND VALVES."

Valves for all requirements

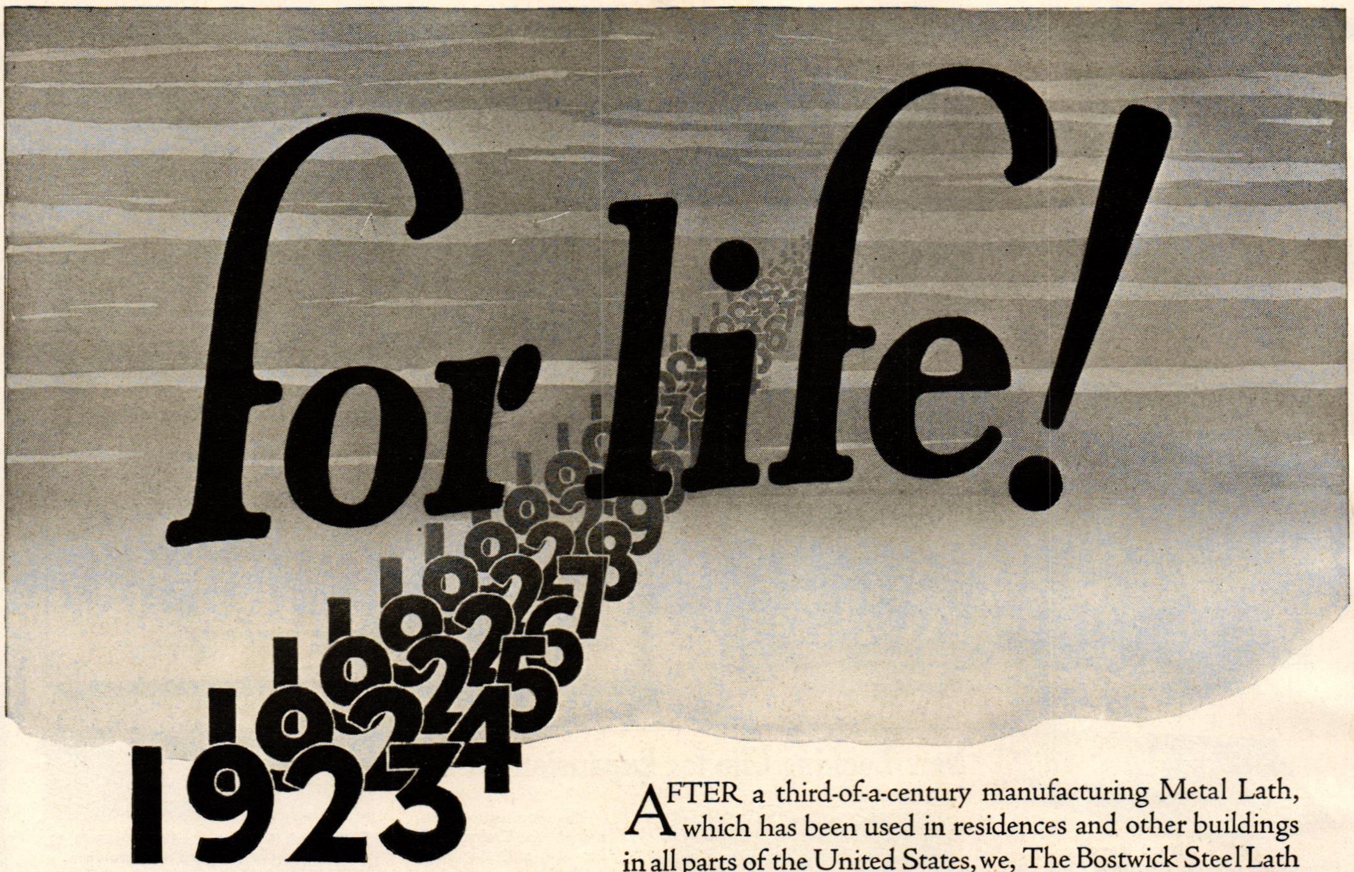
JENKINS BROS.
New York Boston Philadelphia
Chicago Montreal London
FACTORIES:
Bridgeport, Conn. Elizabeth, N. J.
Montreal, Canada



Always marked with the "Diamond"

Jenkins Valves

SINCE 1864



AFTER a third-of-a-century manufacturing Metal Lath, which has been used in residences and other buildings in all parts of the United States, we, The Bostwick Steel Lath Company, desire to announce that our 30 years of experience have *proved* the permanence of Bostwick Lath on interior construction. That is a plain simple statement of the fact—and we make it without reservation.

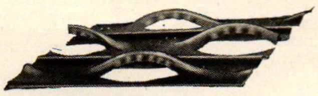
Therefore, because of the exceptional *endurance* of "Truss-Loop" we have decided to come out with a broad and basic Guarantee that will square with the sturdy honesty and permanence of the Lath itself and keep faith with its sterling quality. We take very real pride in publicly announcing the following Guarantee:—

> We Guarantee Bostwick "Truss Loop" Metal Lath, standard, painted, *for the life of the building* where used for interior work as a plaster base for lime, gypsum or portland cement plaster.

Back of that Guarantee stands the Bostwick plant and organization, who first made metal lath in 1890 and are well known to architects, contractors and dealers from coast to coast.

Write for "Princeton" Book, Detail Sheets and Specifications and pocket or desk sample of "Truss-Loop."

The Underwriter's Laboratories have given a one hour rating to wood construction protected against fire by metal lath and plaster.



Bostwick
TRUSS-LOOP METAL LATH

THE BOSTWICK STEEL LATH CO.
NILES, OHIO

is GUARANTEED for the Life of the Building