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THE ARCHITECTURAL FORUM

JULY
1920

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THE ARCHITECTURAL FORUM

AN ILLUSTRATED ARCHITECTURAL MONTHLY DEVOTED TO THE ART, SCIENCE AND BUSINESS OF BUILDING

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The
ARCHITECTURAL FORUM

VOLUME XXXIII | JULY 1920 | NUMBER 1

The Cunard Building, New York

AN EXAMPLE OF THE VALUE OF LENGTHY STUDY IN SOLVING AN ARCHITECTURAL PROBLEM. NOTES ON THE DEVELOPMENT OF THE PLAN

By B. W. MORRIS, ARCHITECT

THE various procedures in connection with this building, unlike the great ships owned by the same company, move slowly. The making of quantities of preliminary studies of plans and judging their commercial possibilities were matters of many months, long drawn out, and frequently laid aside owing to the heavy demands on the time of Sir Alfred Booth, Sir Ashley Sparks and their colleagues, in transporting troops and munitions in 1917 and 1918; in fact, it was not until the end of June, 1919, that preliminary studies ceased and the order was given "full speed ahead" on working drawings, specifications and contracts.

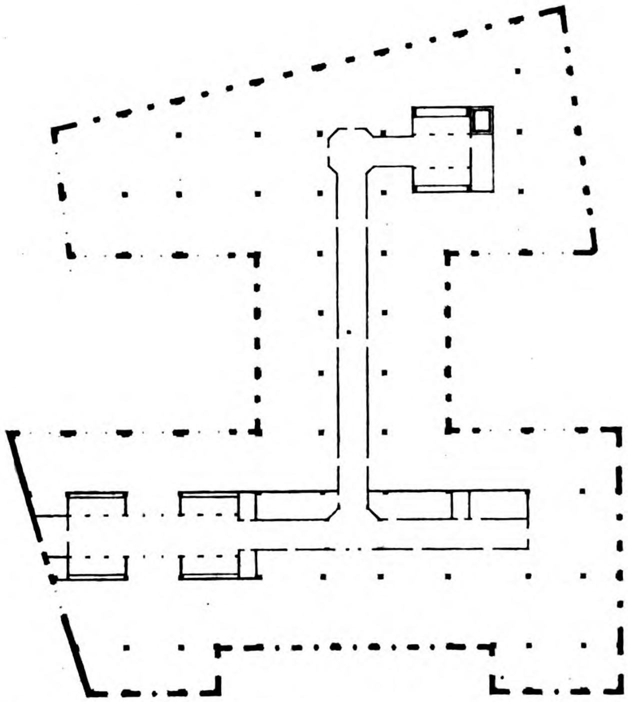
Seldom has a single operation in building construction involved greater complications of size, unknowable costs, irregularity of plot, untoward conditions of foundations, plus a tortuous, curving, steeply sloping subway, cutting through the property and adding to the general interest of the problem.

There was a very early indication on the part of the owners represented by their officials in the Twenty-five Broadway Corporation, that they meant to secure a thoroughly studied result, and having secured their builders, Todd, Irons & Robertson, Inc., and their architect, B. W. Morris, with Carrère & Hastings as consultants, they have consistently shown a spirit of co-operation and confidence, which is indicative of the modern method of attack upon a large building operation. Indeed, it is the writer's experience that the best possible results are secured when the builder, experienced, competent and honest, is appointed at the same time as the architect.

The exhibition of all the various schemes for the plan which were considered would prove tiresome even to professional readers, and certain schemes indicating the progress only are illustrated in this article. Irregularity of the streets in the portion of the city where the building is located caused some complications in conditions of light and air. A dumb-bell plan was finally arrived at for the following reasons: It was possible to provide a large open court to the southwest, admitting light and air to a large section of the building, providing warmth and cheerfulness in winter and cool breezes in summer. This scheme of plan also provided a maximum of frontage on Broadway and in that portion of the building facing Greenwich street which overlooks the North River. It also massed a considerable rentable area in the northwesterly corner of the building opposite the unusually favorable light conditions afforded by the confluence of Trinity place, Greenwich street and Morris street. Thus were the renting requirements in the upper portion of the building best taken care of, while at the same time it was possible by splaying the interior angles of the open court walls to introduce what have been termed four luminary squares, the lighting effect of which is most beneficial to the Great Hall of the Cunard Company.

This room consists of a central octagon 70 feet in diameter and 65 feet in height, with great rectangles on either side of the octagon which swell out into monumental niches recalling the Baths of Caracalla. As a result of the luminary squares supplementing the light of three great arched windows, the Great Hall will be amply lighted for the transaction of business and give full opportunity for the enjoyment of the unusual decorations which are being provided by the owners.

In the upper portion of the building the floors are being rented generally singly or in pairs to individual tenants, and by the arrangement of elevators and other essential features of service almost the entire perimeter of the building is uninterruptedly subject to exterior light and air, there being no closed courts or obstructing walls on entire property. Below the setbacks which are



The Typical Office Floor Plan of the First Study Showing the Development of the Gıeat Light Courts

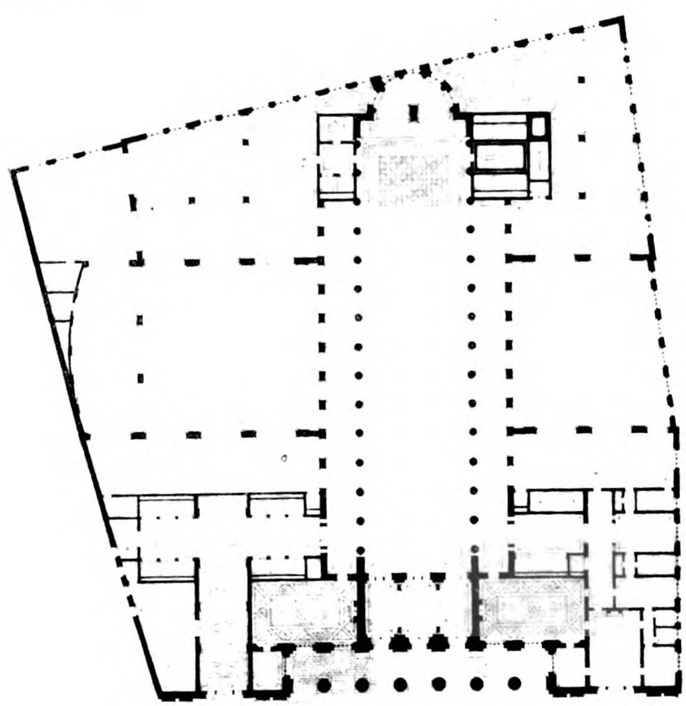
The Broadway entrance to the office building thus becomes the dominant feature of one of these flanking pylons, and the entrance to an important bank the corresponding feature of the other pylon, while the three great central arches with an inscription on the band course over them and sculptural attributes over the colonnade at the fifth story indicate the entrance to the Cunard space and the Great Hall directly behind the entrance vestibule.

In the planning and erection of this building a double check exists on practically every item, and this is frequently trebled and quadrupled before the execution of the work, and it is well that it should be so, since it was not child's play in the field to dig 25 feet across a downtown alley far below the foundations of a sixteen story building, and carry it on piles and at the same time maintain the Broadway subway across the front of the building, with its steel trains thundering on a concrete mattress held in place on a quick-

required by the zoning law, the well lighted working areas are about 63 per cent of the lot area, which is 48,400 square feet.

A treatment of the façade which would indicate the occupancy and prestige of the Cunard Steamship Company and at the same time provide ample and obvious means of access to the office building proper was obligatory. In accomplishing this the restrictions of the zoning law, which at first appeared to be obstructive in nature rather than helpful, were actually found to be the reverse.

The central mass of the building above the fifth floor has been recessed about 7 feet back of the building line, thereby making it possible to carry its sheer height in an uninterrupted vertical plane several stories higher than the end pavilions which flank it and rise on either side to the limit fixed by the zoning law.



An Early Study for the First Floor Plan Showing the Original Basilica Type of Central Space

An early study for the exterior in which the importance of the Cunard offices was marked by a Corinthian colonnade. This was abandoned because of its obstruction to light.

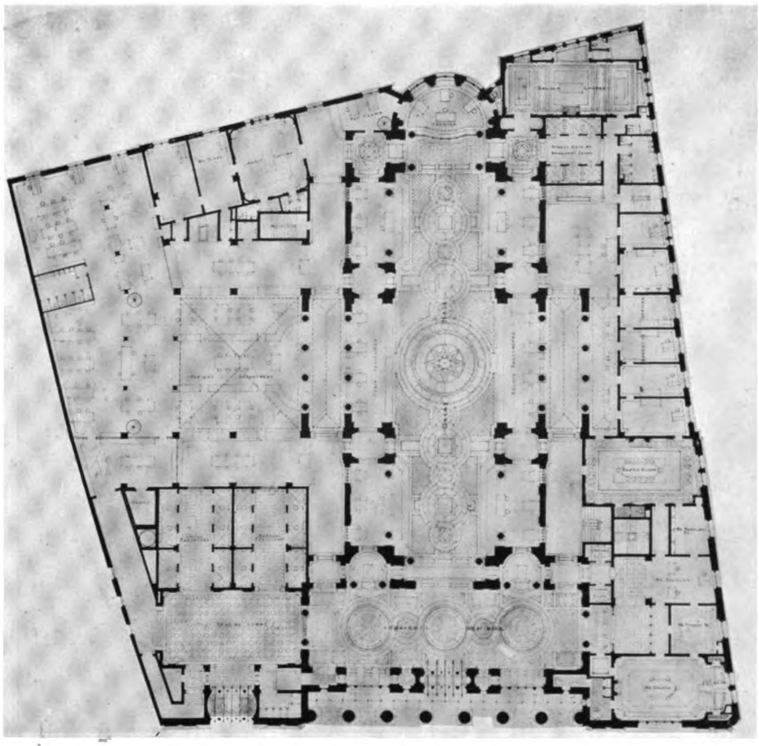
A second study with pilaster treatment and an immense beacon light crowning the building which would be easily seen from any point in New York Harbor.

Studies for Cunard Steamship Company Building, New York, N. Y.
B. W. Morris, Architect; Carrère & Hastings, Consulting Architects

sand bed, far above the bottom of our excavation. Carrying the sixteen story Bowling Green Building on the lot line was comparatively simple, but even this did not admit of many liberties.

The subway traversing the plot was designed to support twenty-six story buildings of various shapes and sizes, determined by the hazard of lot lines of ancient ownership, but the assemblage of these properties into one parcel naturally obliterated the carefully selected points of load deliveries. Then a big and expensive decision (but cheap in the end) was arrived at. We could not ascertain under what conditions and inspection the subway steel was manufactured and fabricated, and as it was largely bedded in concrete, its exact location even could not be verified. To build directly on it meant a cordial invitation to the telephoning of subway grind and roar — so the two sides of the subway have been trenched through rock, solid or otherwise, to a sure foundation below track levels, on which rows of braced columns are set carrying some of the heaviest girders yet seen in New York. These, in turn, carry concentrated column loads, spaced as the plan requires, all clear of the subway steel construction and giving the fullest opportunity for sound insulation.

The building is twenty-three stories in height, contains twenty-eight passenger elevators for general service, five private passenger elevators and three freight cars. The passenger elevators serve



An Interesting Scheme for the First Floor Showing the Adoption of the Three-Bay Treatment for the Great Hall, and the Final Elevator Scheme

been found necessary to accord with the demands of tenants. Thus the final plan of the building, while the same in its general scheme as shown in the illustration on page 6, has provision for a banking room on the right of the ground floor where working space for the Cunard Company is indicated. The colonnade has also been omitted and an arched treatment adopted in order to afford the maximum light in the Cunard offices on the second floor.

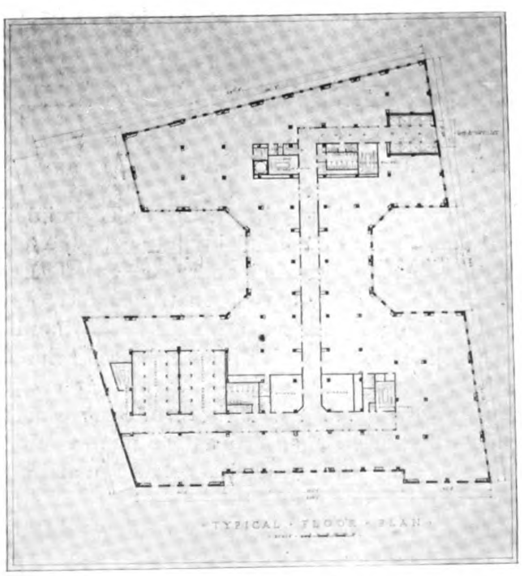
At this writing the steel is only four floors high, but the renting of the building on long term lease is practically completed, all important contracts let, and largely due to the builder's foresight and ability, and in spite of a rising market, the greatest in the history of the building trades, costs are still within "the budget."

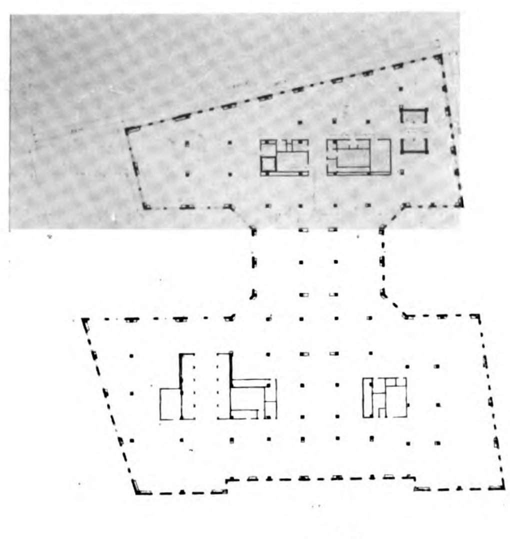
less than 19,000 square feet each, and owing to the size of the floors are separated into two main systems, the principal system being of course near Broadway.

As the building progressed certain changes have

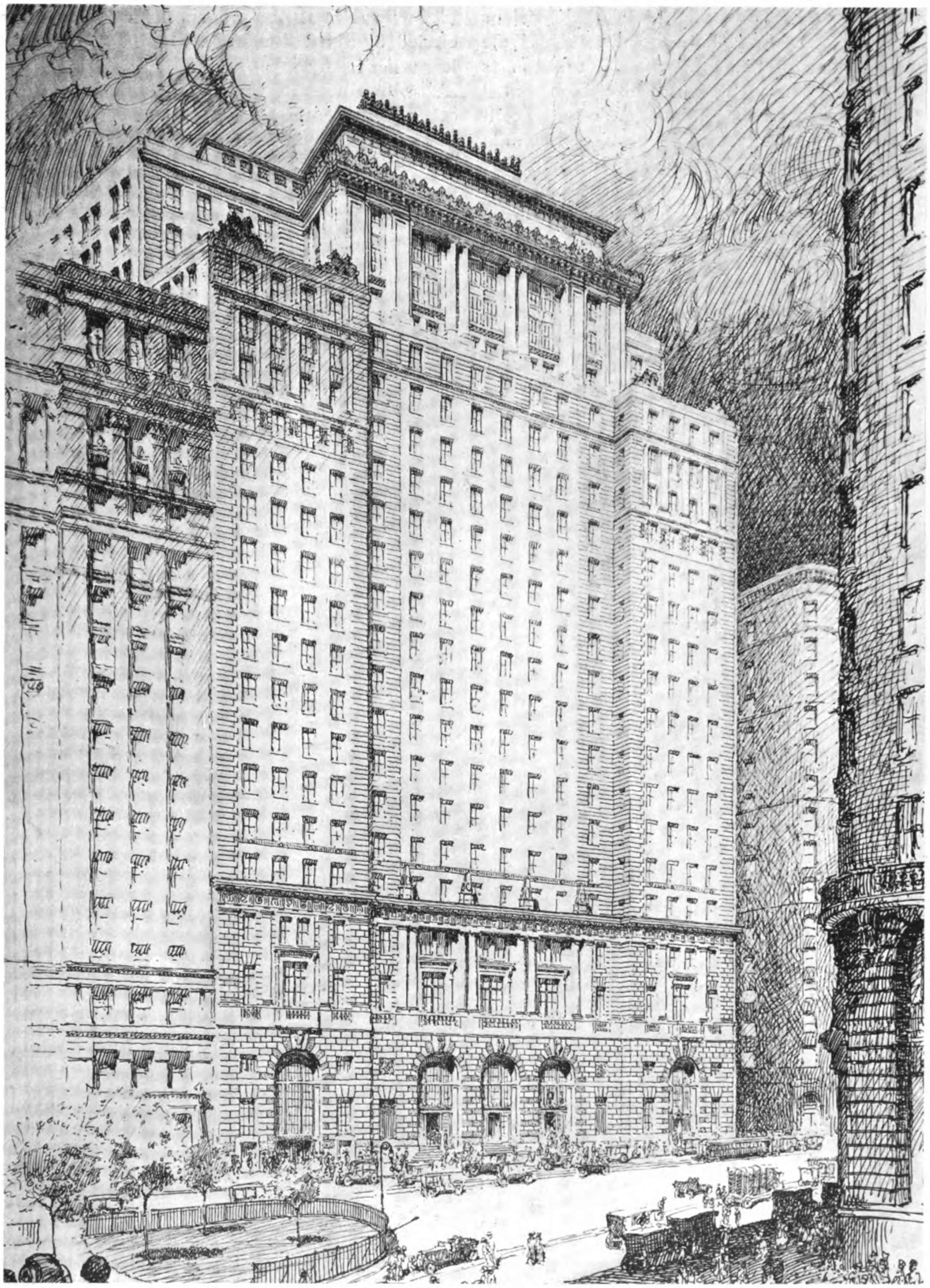
This enables the owners to lease at rates well below those current in New York.

One of the greatest pleasures in connection with this work has been the opportunity to engage the services of some of America's best artists in the





These Plans Show the Typical Office Floors of the Final Scheme Above and Below the Last Floor Served by Local Elevators. The Position and Size of the Courts and the Disposition of Elevators Make Practically Every Office an Outside One



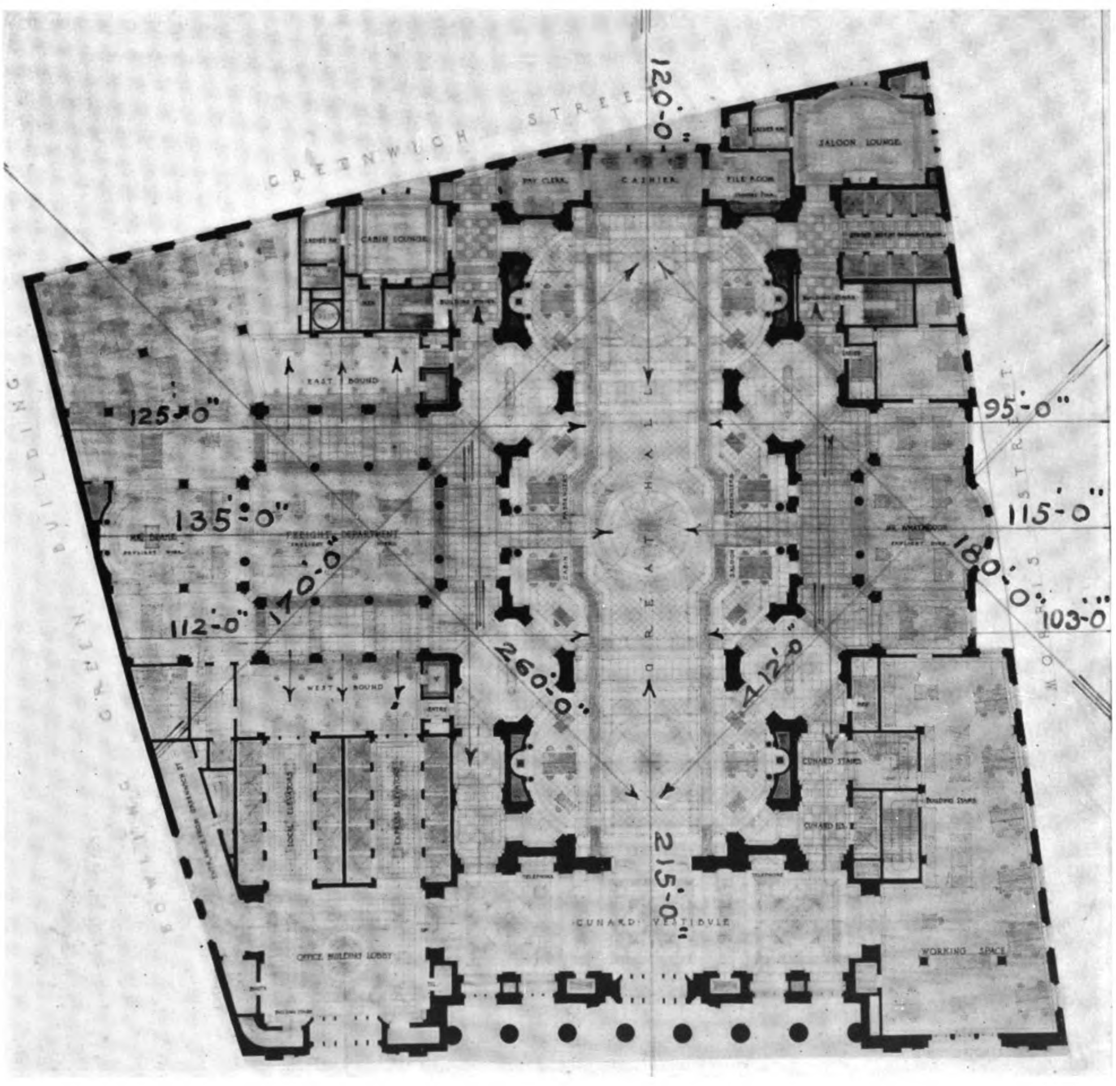
THE FINAL SCHEME FOR THE BROADWAY ELEVATION

In this design the monumental character is achieved without sacrifice of any natural lighting facilities. The respective functions of the building are clearly indicated by the entrance treatment — the left bay admitting to the office elevators, the right to the bank, and the center, the Cunard offices

CUNARD STEAMSHIP COMPANY BUILDING, NEW YORK, N. Y.

B. W. MORRIS, ARCHITECT; CARRÈRE & HASTINGS, CONSULTING ARCHITECTS embellishment of the Great Hall, the spacious apartment on the first floor, destined for the sale of saloon and cabin tickets for passage to all parts of the world. Barry Faulkner will be represented by four great wall maps ; Ezra Winter by the ceiling decoration, reminiscent in parts of the Villa Madama with the added opportunity of portraying four voyages of discovery, — those of Columbus, Leif Ericson, Cabot and Drake. On the floor, under the central dome, a compass in colored marbles will point to the true north and will be encircled by a 4-foot ring in bronze, decorated in low relief from the designs of John Gregory, who also will contribute two additional low reliefs in other parts of the floor. The remainder of the room is simple but big in scale and well lighted.

It is planned that in May, 1921, those who are interested may see in place the beautiful designs these gentlemen are now at work upon, if this be not one of those schemes which "gang aft a-gley."



The Final Scheme for the Principal Elements of the First Floor Plan Indicating the Monumental Treatment of the Great Hall and Showing the Sources of Natural Light that Will Illuminate It. The Figures Give the Distance to the Point of Light Obstruction

Modern Cotswold at St. Martins, Pa.

A GROUP OF SUBURBAN HOUSES BY DUHRING, OKIE & ZIEGLER, ARCHITECTS

By HAROLD DONALDSON EBERLEIN

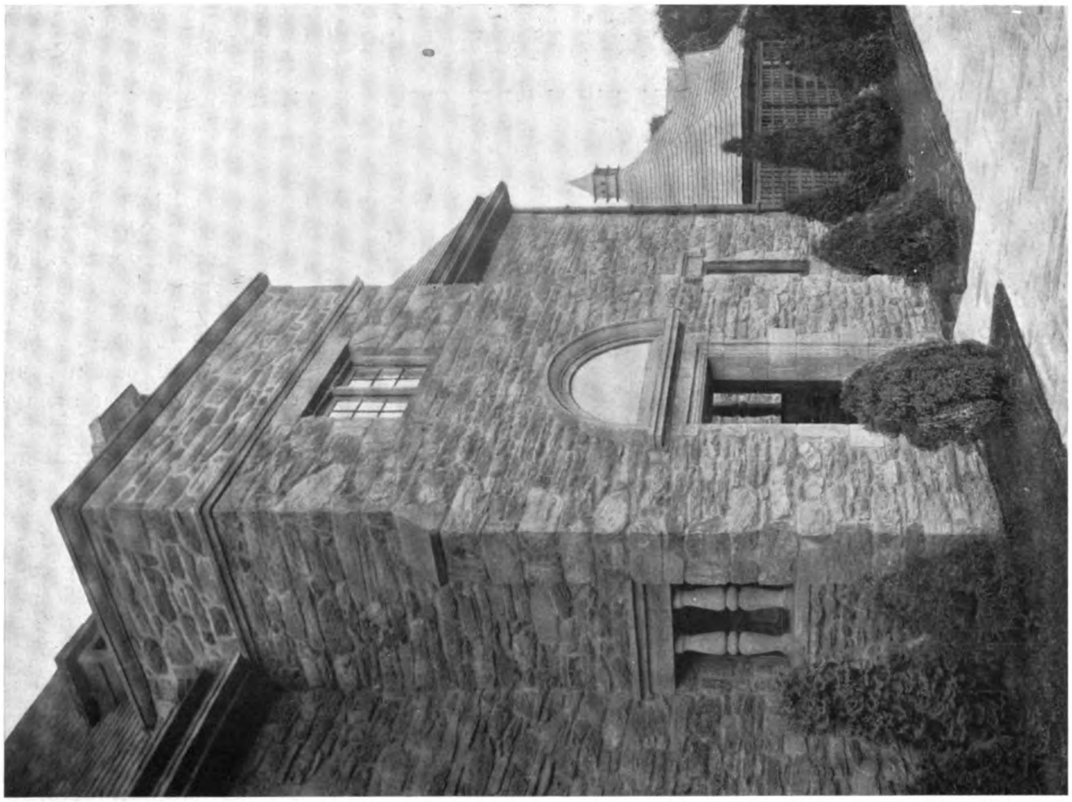
THE three Cotswold houses planned by Messrs. Duhring, Okie & Ziegler, and built under their direction at St. Martins, were cast in what might be called a "Cotswold mould" for several reasons. The locality provided abundant material, easily quarried, which seemed to be particularly adapted for building walls of houses of this type; in the neighborhood there were already such a number of houses built in this style that its architectural character seemed to be very definitely established and, finally, this particular manner of building was especially favored by the owner of the property, who had already had a considerable part in the development or upbuilding of the neighborhood, and it was also favored by the architects, much of whose most successful and interesting work has been of the Cotswold cottage type.

All of these reasons for the choice of this particular style of building are entirely legitimate and justifiable. To make use of such materials as are near at hand and to employ them effectively in a manner which their nature sug-

Entrance Side of Lower House

Detail of Gables and Stair Hall Bay, Lower House (No. 1) on Navahoe Street

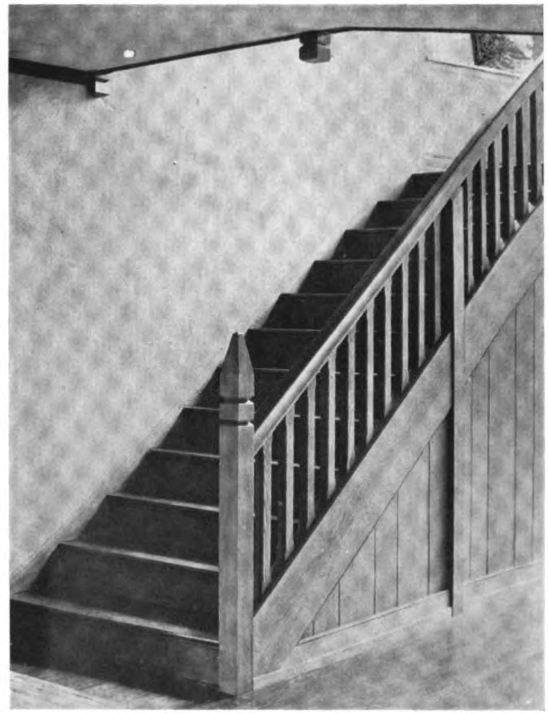
ENTRANCE DOORWAY AND STAIR WINDOW



CENTRAL FEATURE OF GARDEN SIDE

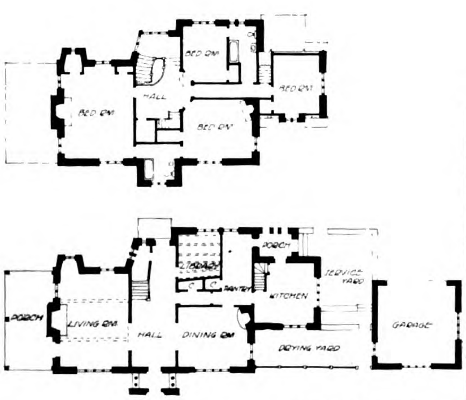
LOWER HOUSE (No. 1), NAVAHOE STREET, ST. MARTINS, PA. DUHRING, OKIE & ZIEGLER, ARCHITECTS

Living Room Fireplace in Lower House

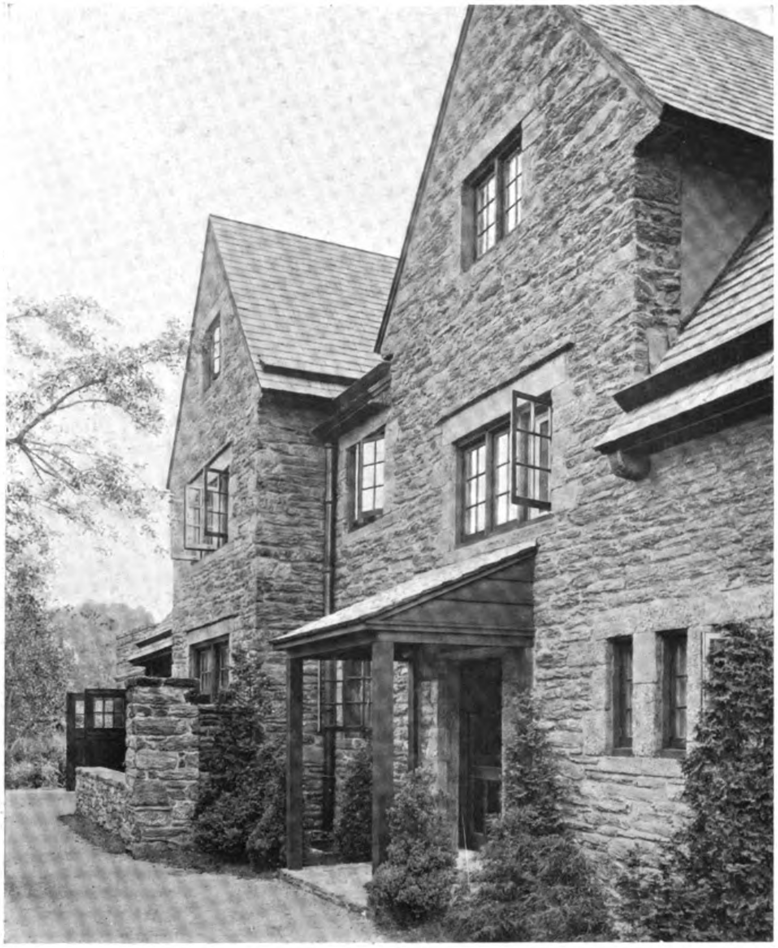


Staircase in Lower House

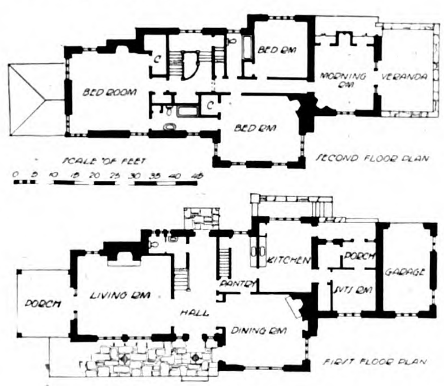
gests is but the part of economy and common sense; such has been the custom of builders since the constructing of houses first began. It is surely to be commended that sufficient consideration be paid to the character of the buildings already existing near by, that new structures be planned in such wise that their appearance might help to preserve, unimpaired, the architectural consistency of the locality. To follow one's bent in the choice of an architectural style, and to adopt it because it gives an added pleasure to the work of building



Floor Plans and Garden Side of Lower House on Navahoe Street



Entrance Side of Middle House (No. 2) on Navahoe Street



Floor Plans of Middle House

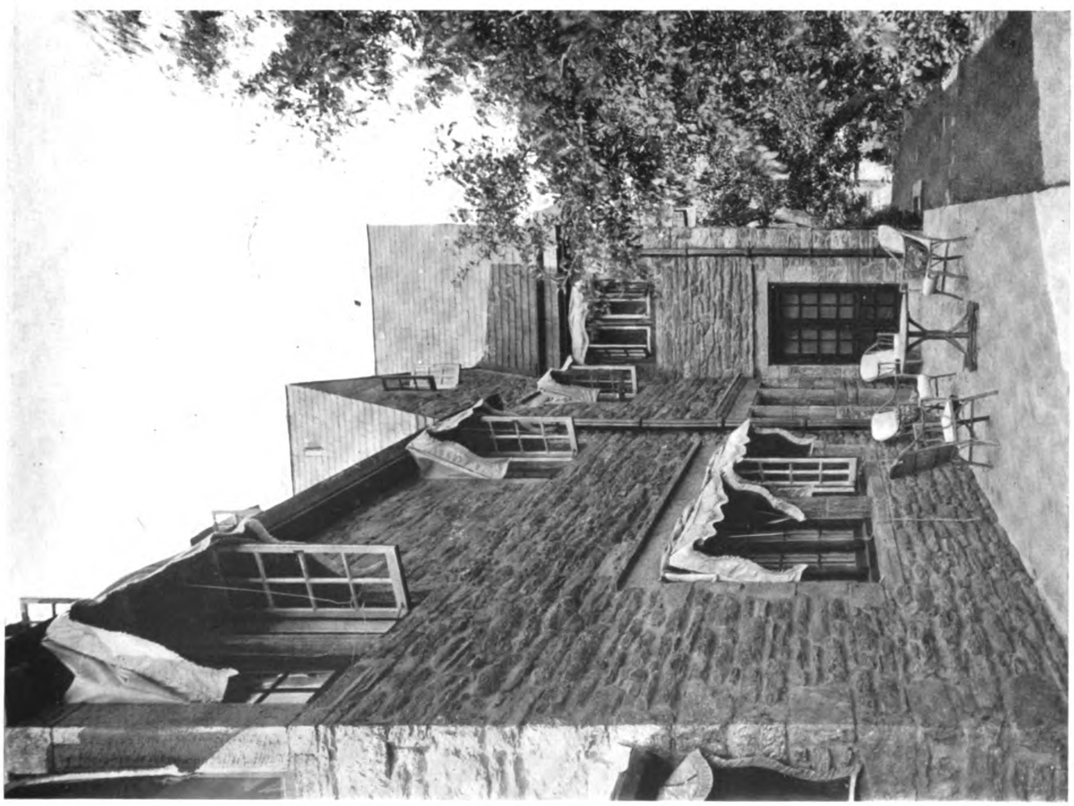
and also because it will continue to gratify when the structure is completed, is surely permissible as long as the physical requirements are fully satisfied and due heed has been paid to the surrounding conditions.

The pictures will give an excellent idea of the appearance of these three houses which add greatly to the attractiveness of a suburb which ranks well among the most beautiful and distinctive in America, the result, be it noted, of consistency in designing and planning many of the buildings so that they are in general agreement. Many of the residences at St. Martins are possessed of grounds of only a very small area, but considerable care has been devoted to dividing the property into attractively laid out building plots, to the arrangement of houses upon individual plots and also to the very tasteful development of the plots themselves, and the result of all this thought and effort is apparent in the appearance of the suburb as a whole.

For the wall material of the group of houses under discussion, the native gray stone of Chestnut Hill has been used. Such simple cut stone embellishment as has been attempted has been wrought out in the same material which has well demonstrated its fitness for use in the execution of straightforward and vigorously modeled details. In such instances as the balusters and the semi-circular tympanum over the entrance of No. 1 or the number tablet above the door of No. 3 it is encouraging to find a real renewal of the old time spirit of craftsmanship that took without hesitation the materials at hand and, with their nature and limitations well in mind, wrought therein a suitable type of ornament. The same willingness to frankly accept the characteristics of a material and the same happy faculty of obtaining excellent results is seen in the mantels of No. 3.

The exteriors of all three houses present an appearance of frank and engaging simplicity which has been handled to create a very picturesque grouping of masses of masonry. To the richness of stone walls there is added the texture of slates upon the roofs and fortunate use has been made of casements set within the deep reveals of numerous windows.

Advantage has been taken, where differences of grade exist, to use terraces either flagged with slate or stone or else merely held in place by stone retaining walls and planted with grass. Where a house possesses both a veranda and a terrace they



VIEW ALONG TERRACE

DETAIL OF SOUTH FRONT

MIDDLE HOUSE (No. 2) ON NAVAHOE STREET, ST. MARTINS, PA. DUHRING, OKIE & ZIEGLER, ARCHITECTS

LIVING ROOM TOWARD THE PORCH

DINING ROOM DETAIL

MIDDLE HOUSE ON NAVAHOE STREET, ST. MARTINS, PA. DUHRING, OKIE & ZIEGLER, ARCHITECTS are placed upon the same level, and both terrace and veranda are floored or paved with the same material with excellent results.

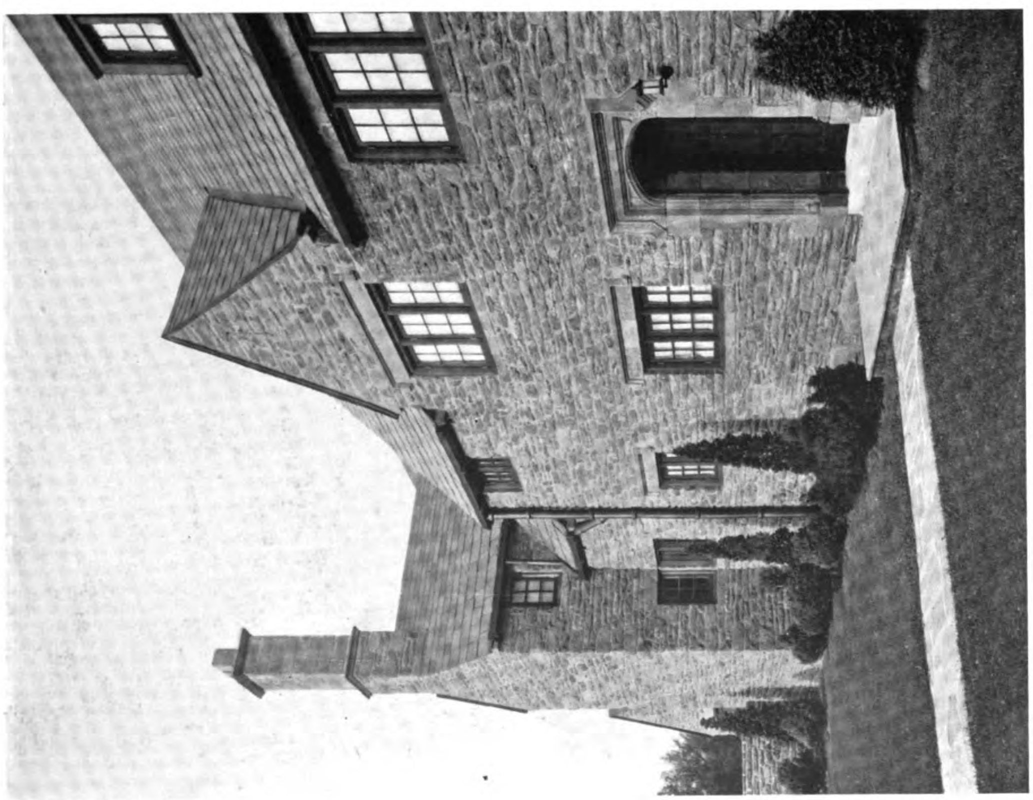
It is one of the fundamental principles of good taste in architecture, and particularly in domestic architecture, that the exterior of a house should give at least a hint or a suggestion of what the interior may prove to be. An architect may well be so imbued with the spirit of the mode in which he is working that in the exercise of his liberty of choice as to interpretation he will preserve at least some measure of coherence between the appearances of exterior and interior and will not contrive a somewhat rugged Cotswold structure to shelter a delicate Adam interior, replete with every detail of attenuated refinement. Nothing could be more admirable in itself, or amid a proper setting, than a clever and scholarly use of the Adam manner of decoration, but in suburban homes such as these, interior adornment of this nature would have no element of line or scale in common with the exterior, no point of contact to serve as a base upon which they may be welded into some semblance of congruity. This reminds one of Ruskin's saying, that nothing is beautiful which is not suitable.

This disposition, therefore, to bring about a measurable accord between outside and inside, is an especially commendable step when one recalls the extent to which the Cotswold mode has sometimes suffered in America from unintelligent interpretation. Small accessory touches, such as the simply decorated leaden downpipes of No. 1, add an appreciable interest in the way of minor details that might more often be heeded with advantage.

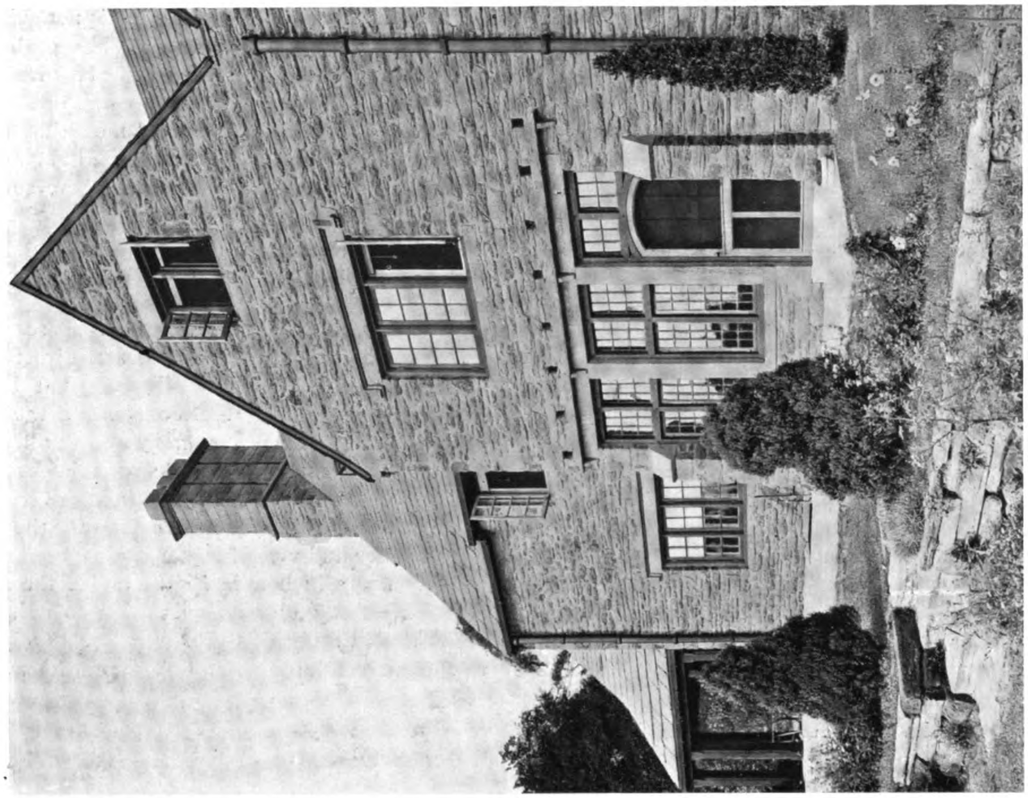
Floor diagrams of these various houses show plans which carry out the simple and direct treatment which has been already indicated by the exteriors of the houses. Rooms are few and of generous size rather than many and small. The woodwork is exceedingly simple, sometimes stained and sometimes painted white. Much use has been made of native stone for hearths and for the floors of vestibules and verandas.

Particularly in houses Nos. 1 and 2 the architects have felt under no obligation to adhere to the Cotswold tradition of long and relatively narrow masses of building, which means a structure

Garden Side, Upper House (No. 3) on Navahoe Street



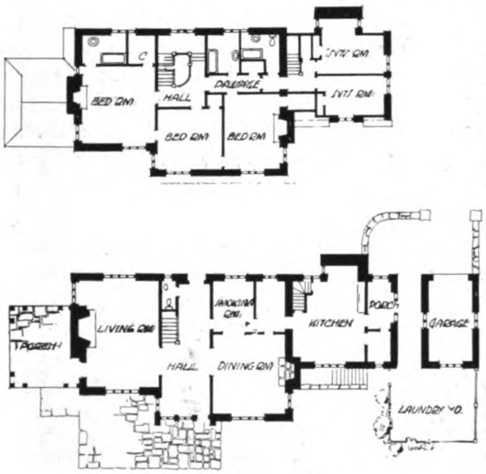
DETAIL OF NORTH FRONT AND ENTRANCE



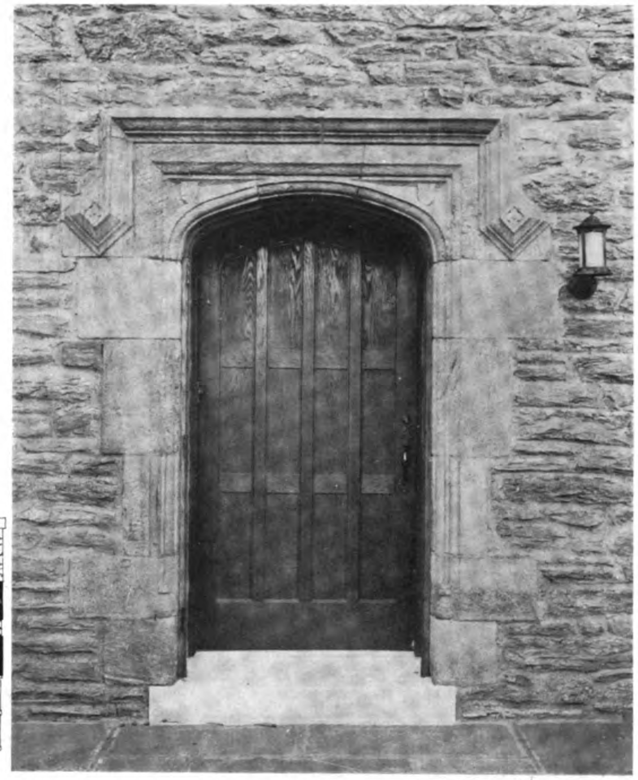
DETAIL OF SOUTH FRONT GABLE

UPPER HOUSE (No. 3) ON NAVAHOE STREET, ST. MARTINS, PA. DUHRING, OKIE & ZIEGLER, ARCHITECTS of but one room in depth. On the contrary, these houses resemble certain old Cotswold structures, exceptions to the general type, which have been much added to and made more compact by additions.

Several of these houses at St. Martins are provided with garages, and their planning and arrangement seem to call for particular notice. Placed as they



Floor Plans of Upper House


Entrance Doorway of Upper House


View from the Street of Upper House (No. 3)

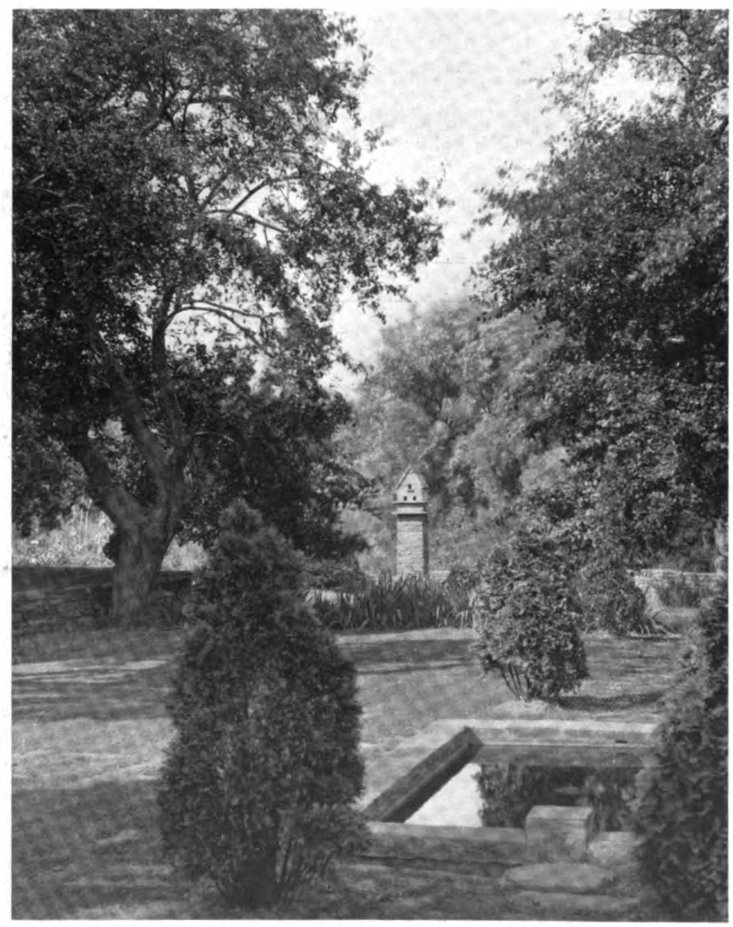
Living Room Fireplace

the tall windows which light the hall is such that they are included as a part of the architectural treatment of the door.

Other fortunate details of design are in connection with the chimneys, several of which have horizontal courses of cut stone near their tops which give to the stonework an added note of accent. Quoins set at the corners of the larger chimneys, where they appear to strengthen the rubble masonry, confer another note of distinction. The exteriors of these houses gain greatly in attractiveness by the taste with which minor or accessory details are supplied.

are close to the residences, if not actually joined to them, the grouping gives the double advantage of increasing the picturesque and rambling bulk of the structures and making possible considerable economy in the way of heating and, doubtless, adding much in the way of convenience. Where these garages are not actually joined to the main structures, they are so connected with them by stone walls or wooden trellises that the effect of structural unity is secured.

In these three residences at St. Martins there is an unusually happy arrangement of the fenestration so that in many instances door and window openings are grouped together. Particularly in the case of a stone building greater breadth and dignity are obtained by this treatment than by planning many separate openings scattered over wide expanses of exterior walls which have the appearance of weakening the masonry. The garden side of the house on page 13 gains by the careful handling of windows and doors. The grouping of



Garden in Keeping with Spirit of Houses

Interior Decoration

A HOUSE DESIGNED IN THE ITALIAN STYLE

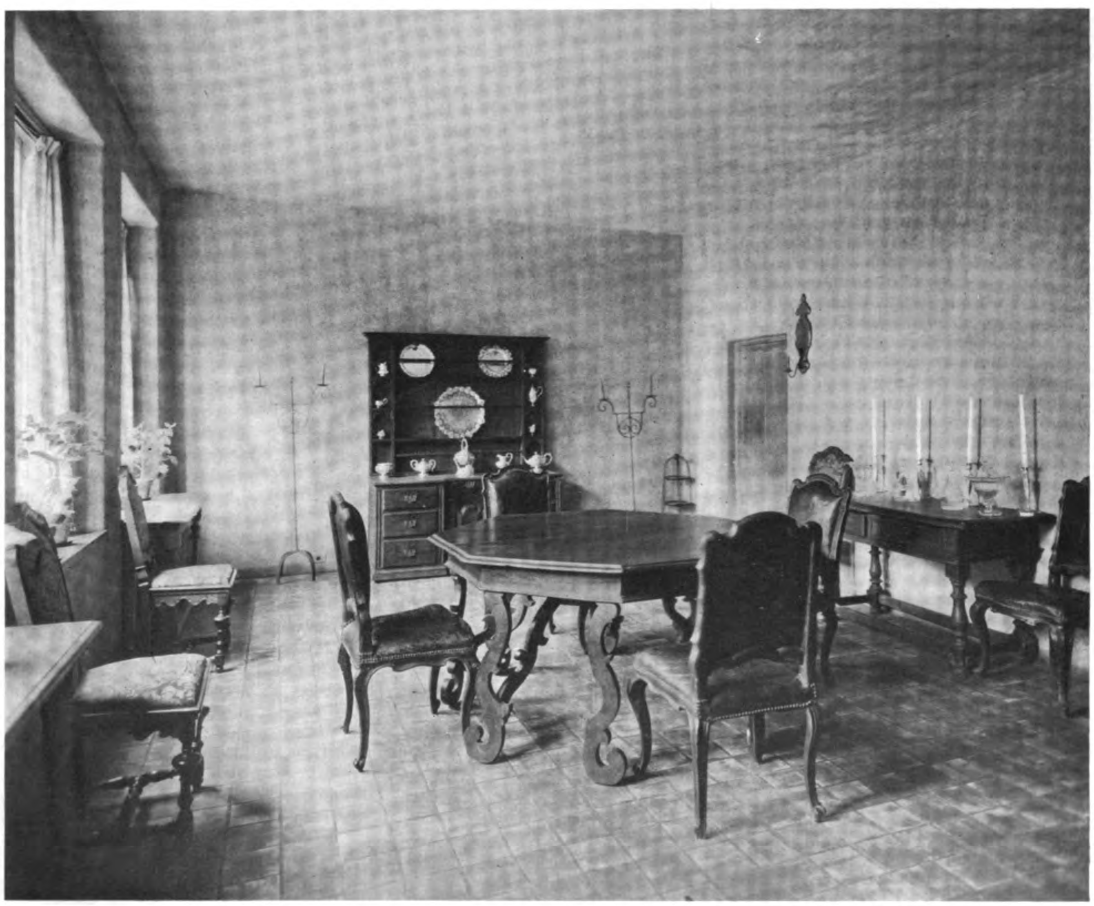
RICHARDSON, BAROTT & RICHARDSON, ARCHITECTS

THE present popularity of Italian styles in decoration is the result of several causes. The tendency, in domestic architecture, is toward a few large rooms rather than a greater number of rooms small in size. Large rooms are apt to involve broad wall spaces and large door and window openings and for decoration, under these conditions, the various styles of Italy are well adapted. Then, too, this is the day of simplicity in decoration and the Italian styles adapt well whether the simplicity be somewhat austere or possibly more fully developed where ornament, though adequately used, is employed with care and due restraint.

With the increasing vogue of the Italian has come a better understanding of its use and its widening popularity is due largely to the success with which it is being handled by architects and interior decorators.

A very interesting use of decoration of this nature is found in the interiors of the residence at 21 Beaver place, Boston, the work of Messrs. Richardson, Barott & Richardson. A façade of brick and stone gives a certain intimation of what the interior will be, for it is a very frank and simple exterior, such as might be found in almost any of the highways or byways of Venice.

From the street the main doorway, in which are set square grilles of antique Italian wrought iron, opens through a small vestibule into an entrance



View of Dining Room

LOW END OF GREAT DRAWING ROOM

DETAIL OF LIBRARY

RICHARDSON, BAROTT & RICHARDSON, ARCHITECTS


Entrance Hall from Vestibule Door

hall, not large in area but low ceiled which increases its apparent size. Plain stone colored cement is used for the floors and the walls are of rough plaster which has been painted first an azure blue and then a pinkish buff which has flecked off showing the blue beneath. A grille of old wrought iron conceals a heating radiator set in a shallow alcove near the ceiling, and a corner fireplace with elevated hearth, old andirons and Italian hood heightens the quaint effect given by the use of many valuable details of antique furnishings.

From the entrance hall a winding stone stairway set in the thick walls leads to the main floor where, filling one entire end of the house, is a lofty drawing room where walls of a pale buff rough plaster form an effective background for old tapestries, fabrics and portraits and treasures in the way of Spanish and Italian furniture, old brasses and wrought iron. The ceiling of this great drawing room is of walnut, made in a coffered form with carving partially gilded and polychromed. An added quality of picturesqueness is given to this room by the different heights at which the ceilings are placed. The greater part of the room is two stories in height but at one end the height is but that of one story. In part of the wall space thus formed is a small balcony across which is placed an antique iron grille. A library which opens from the drawing room is walled with chestnut, very simply stained and waxed, and an added distinction is given to the room by the use of an antique Italian mantel of stone.

What might be considered by many to be the most interesting room of the house is the dining room which is floored with square tiles of a greenish blue covered with a very low or dull glaze. Walls and ceiling are of rough plaster with which has been mixed a little dry color which has tinted the plaster to a rich and rather warm tan which offers a striking setting for tables, chairs and buffet of Italian walnut and lighting fitments, extremely simple, of iron.

The unusual success with which these very interesting interiors are arranged is largely due to the skill which has directed the use of very simple materials and the wise restraint which has pre-


Drawing Room Doorway Looking into Stair Hall

vented the use of ornament and accessories in excess. Some one has very aptly said that the essence of success in interior decoration, in fact, success in any department of architecture or the kindred arts, consists in knowing when to stop.

There are countless instances where the use of the most valuable accessories has produced an interior of hopeless and overcrowded confusion instead of an appearance of rich simplicity and tasteful elegance which might easily have been secured with such material to work with. Restraint and careful choice of objects, together with their arrangement with thought and discrimination, are sure to bring their due and rich reward.

Detail of Great Drawing Room

A Successful Alteration for a Restaurant

GEORGE F. SHEPARD, ARCHITECT

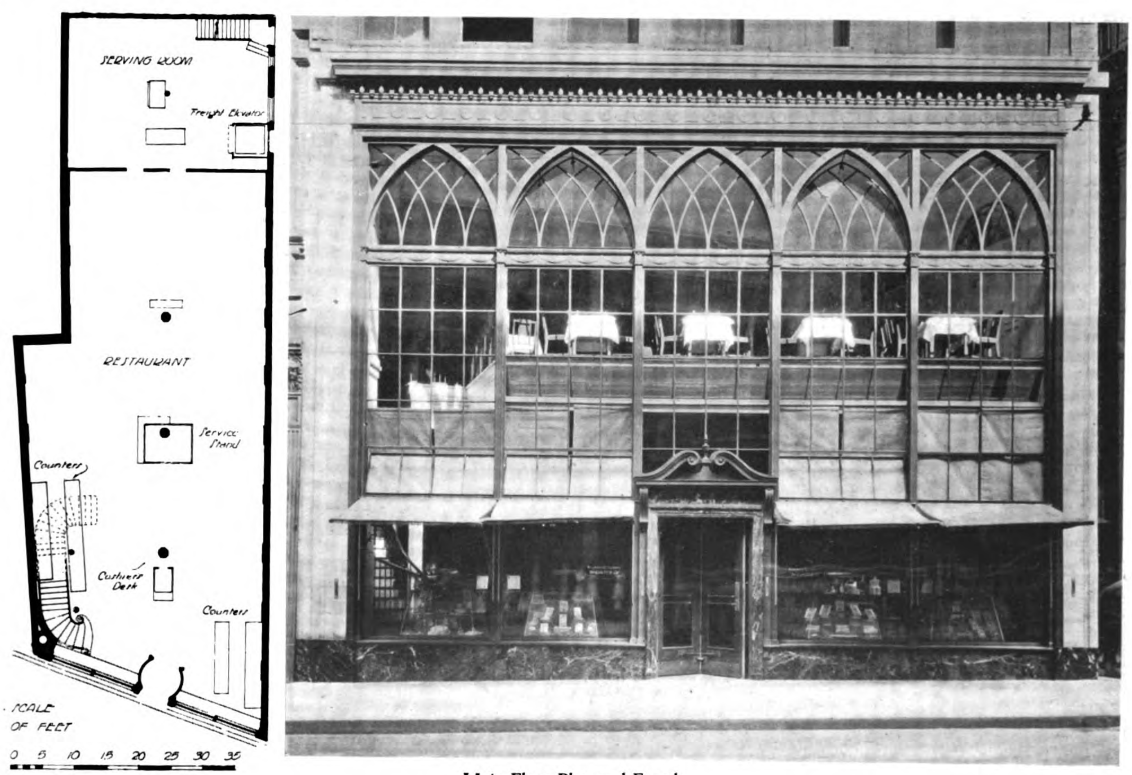
THE Wedgwood restaurant at 531 Washington street, Boston, is of interest in showing the possibilities in altering old commercial buildings. In its planning and decoration unusual taste and ingenuity have been used.

The premises include the first and second floors of a building about 50 feet in width. The entire front of the restaurant has been planned as a single unit, very well carried out in a tasteful combination of marble, terra cotta and metal which involves the use of considerable plate glass, not arranged in vast expanses but cut into smaller divisions in a very simple and graceful design which goes far toward establishing the character or keynote of the restaurant as a whole.

Entrance doors from Washington street open into the main or ground floor restaurant and it is seen at once that the exterior, planned in a modification of the Adam style, indicates the spirit in which the entire restaurant is arranged. Above a tall paneled wainscot which extends entirely around the floor are walls of Caen stone divided into a series of slightly recessed and regularly spaced arches. These semicircular spaces or lunettes are filled with large plate mirrors over which are set richly wrought grilles toned to a dull gold, the refined Adam pattern of which gives a note of great distinction to the entire interior.

Between these lunettes, as well as in certain other wall spaces demanded by the working out of the plan of decoration, are placed modeled oval plaques which are painted in soft colors after the manner of a Wedgwood pâte-sur-pâte. The ceiling, supported upon tall fluted columns, is divided by heavy transverse beams between which are slightly curved panels adorned with relief in color and from a central medallion in each panel hangs a bronze lighting fixture. The fixtures aid greatly in carrying out the spirit of the Adam style which has been consistently adhered to throughout. The floors of the building are of terrazzo marked off into squares, at the intersections of which are set tiles in a variety of colors and designs.

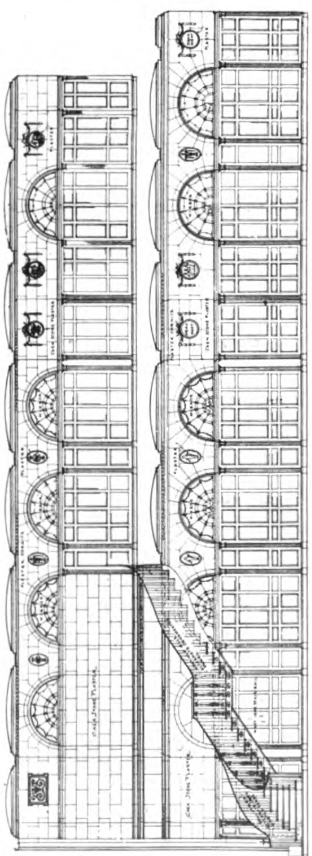
Close by the entrance from the street a main stairway, very well designed, leads to the restaurant upon the upper floor. The stairway, arranged with a graceful, sweeping curve, is of green and warm gray marble surmounted by a light iron balustrade, the occasional inserts of which are picked out in gold leaf.



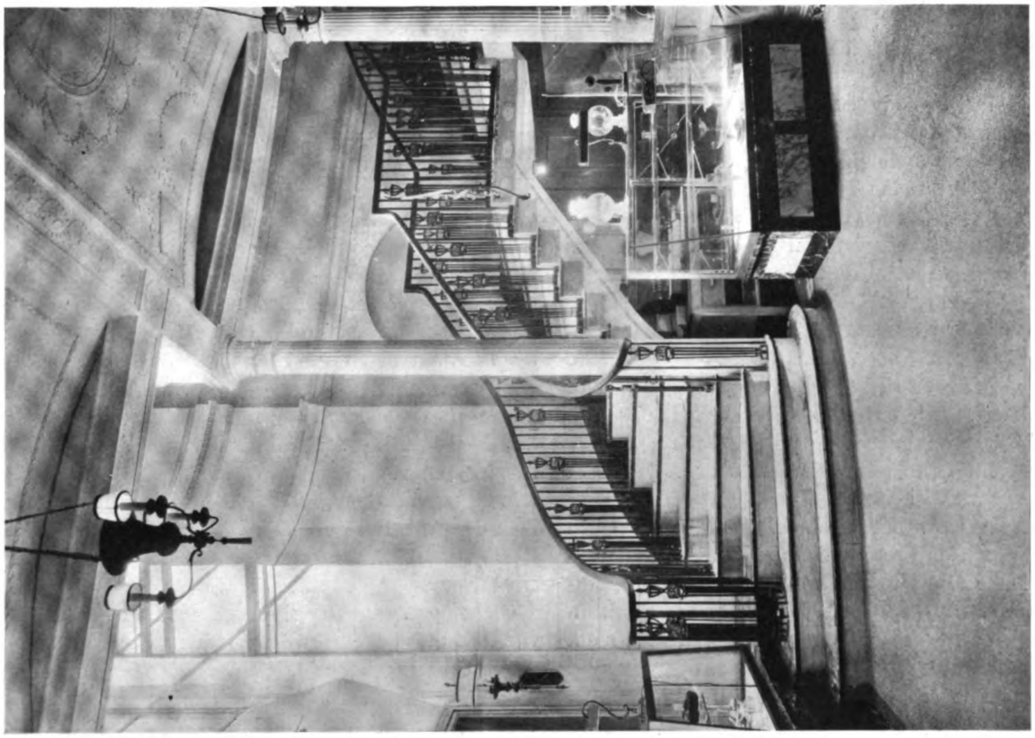
Main Floor Plan and Façade

The second floor beam against the windows is faced with mirrors which avoid a break in the continuity of the fenestration

VIEW TOWARD SERVING ROOM ON MAIN FLOOR



LONGITUDINAL SECTION SHOWING LEFT WALL



STAIRWAY TO SECOND FLOOR RESTAURANT

WEDGWOOD RESTAURANT FOR THE GINTER COMPANY, BOSTON, MASS.

GEORGE F. SHEPARD, ARCHITECT

DEPARTMENT OF ENGINEERING & CONSTRUCTION

CHARLES A. WHITTEMORE, *Associate Editor*

The Automobile and the Private Estate

PART IV. CURVES AND TURNS

By TYLER STEWART ROGERS

THERE are three typical road junctions to consider. The first is shown in Figs. 2 and 3. In Fig. 2 is shown a junction having curbs of very small radius. It may be seen from the dotted lines that a car must swing out into the centers of both roads, or almost across one road, in order to make the turn. This exposes the car to collision with other vehicles moving in the opposite direction, as well as blocking traffic moving in the same direction.

In Fig. 3 is shown the same junction with curbs of liberal radius. Here both cars can negotiate the turn without interference.

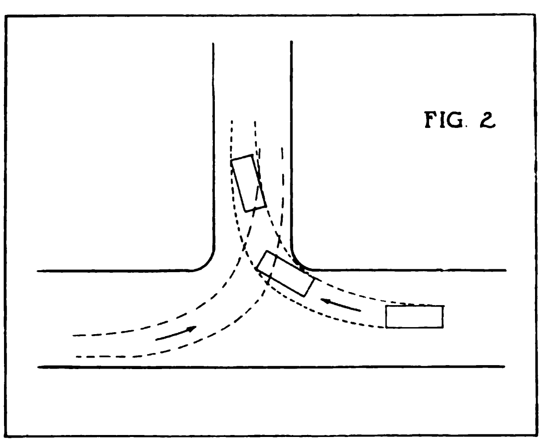
The second type of junction is shown in Fig. 4. In this instance the driveway meets the road at an acute angle. The curb within the acute angle in this case should never be of less radius than 18 ft., for automobiles making a sharp turn of this kind reach their minimum curve and follow it for some distance. When the angle is very acute, it is frequently desirable to fork the entrance drive around a triangular island to reduce the amount of paving otherwise necessary in the delta.

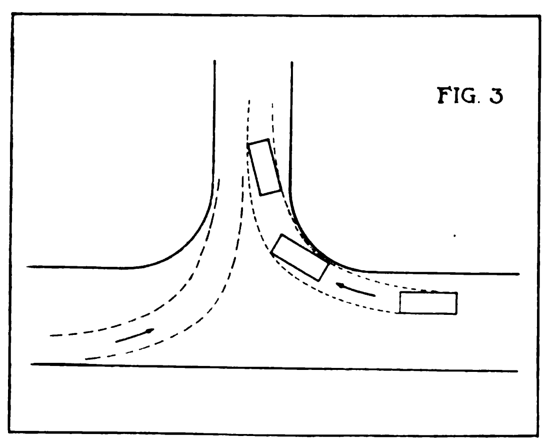
The third type of junction occurs when the two roads diverge in the form of a Y. The difficulty of the problem depends on the acuteness of the angle between the roads. When very acute, the solution generally demands a separate roadway around a triangular island, as in the second type. When the angle between the roads is broad it is merely necessary to cut back the junction sufficiently to provide a radius of not less than 18 ft.

The most difficult problem introduced by the automobile in estate design is the turn at the forecourt or in the service yard. Many costly errors have been made, due to insufficient planning ahead of construction work.

Each problem presents its own difficulties and no two cases are alike. It has occasionally been the practice to determine the final shape and size of turns by means of an automobile actually driven over the ground a number of times, the location of the wheel marks indicating the position of the road. This procedure is satisfactory when properly carried out with several types of cars but, being based on trial and with the possibility of error, is often a very unsatisfactory makeshift. To a considerable extent correct design can be determined in the drafting room, when sufficient consideration is given to the subject.

There are four general classes of turnarounds: (*a*) the simple loop serving only as a means of reversing direction; (*b*) turns having a stopping place opposite the approach; (*c*) turns having a stopping place at one side of the curve, parallel to the direction of approach; and (*d*) turns having more than one approach. Each class has many variations, but with certain similar requirements.





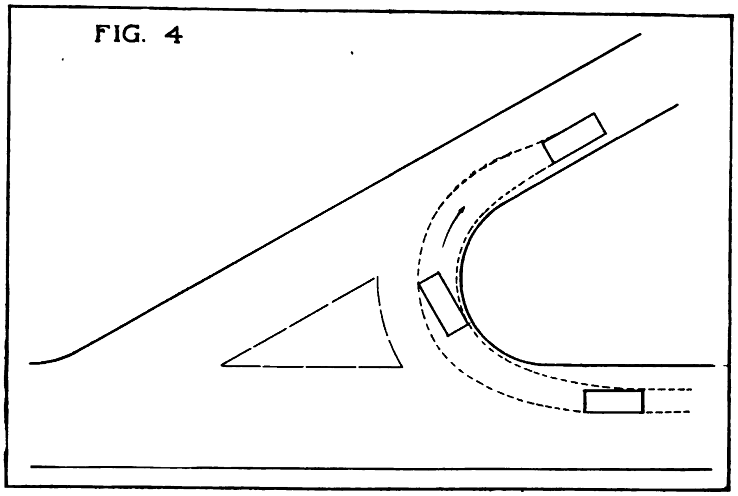


FIG. 4

minimum outside turning radius of the car, and the radius of the head of the inner circle is equal to the turning radius of the inner rear wheel. The minimum outside radius of large passenger automobiles ranges from 23 ft. to 30 ft., and the radius of the circle described by the inner rear wheel is from 10 ft. to 18 ft. If a machine has occasion to complete the circle, it will do so at the same minimum radius as shown by the dotted lines.

An unsymmetrical loop is shown in Fig. 6. All of the reversing of direction is performed on one side at X.

The simple loop is shown in Figs. 5 and 6, which illustrate a symmetrical turn in the first instance and an unsymmetrical turn in the second. In Part I of this article, in which the movement of an automobile was discussed, it was demonstrated that in making reverse turns there must be a point of straight travel between the two different parts of the curve. This condition is met with in the turn shown at A, Fig. 5, at points X and Y. For purposes of illustration these turns are drawn to show the path of a single automobile. When the automobile is actually turning around the loop it reaches its maximum degree of curvature, hence the radius of the head of the loop is equal to the

Before discussing the second and third types of turns, both of which involve the problem of the stopping place within the curve, it should be noted that the body of an automobile is not tangent to the circumference of the curve it is describing. See Figs. 5 and 6, and Part I. Because of this fact an automobile cannot be brought up close to a curb or to a landing block without first straightening out the wheels. Hence, whenever a stopping place is introduced into a turn, it is desirable to provide a straight section approaching and leaving this point.

The second type of turn involves a stopping place at the head of the curve, when the machine

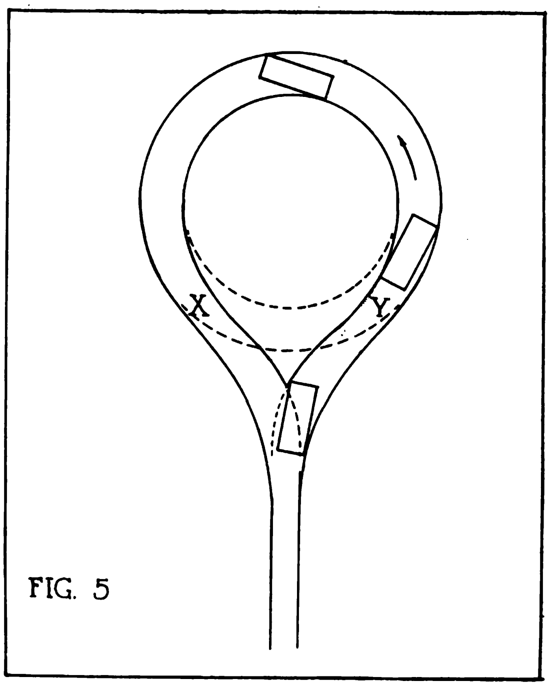


FIG. 5

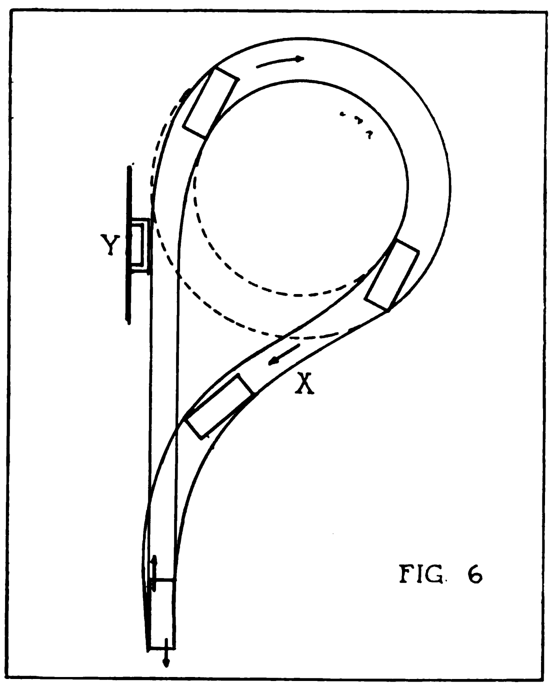


FIG. 6

is at right angles to its direction of approach. In Fig. 7 is shown a simple, formal approach. The curve is made up of two reverse curves separated by a tangent equal to one car length at the stopping point. Even this allowance does not bring close contact at the stopping place. If this curve were simply a circular arc of minimum radius, the car would not be able to stop close to the steps without backing.

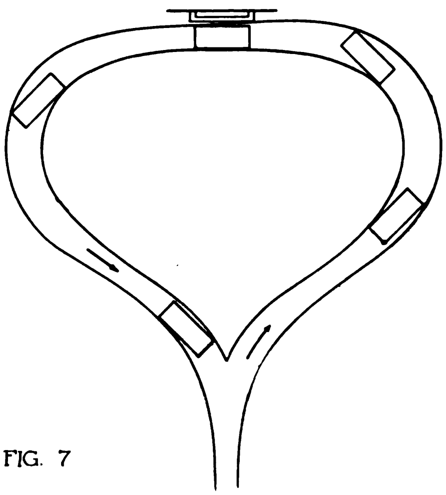


FIG. 7

It should be noted that the introduction of the tangent section not only increases the sharpness of the reverse turns at the throat of the curve but also widens and lengthens the throat as compared with Fig. 5. A case in point may illustrate the importance of this fact. A formal forecourt bounded on three sides by the residence and its two wings had a stopping point at the center of the turn. The designers built a wall around the court, making it of square shape about 75 ft. long on a side. The gateway opposite the entrance to the residence was just the width of the driveway. It was found that large cars could not negotiate this turn if they stopped at the doorway and be close to the step unless they went beyond the step and then backed. Since it was impossible to widen the court to its proper size this intolerable condition was partially remedied by increasing the length of the forecourt, placing the wall and gate some 10 or 15 ft. farther away from the residence. The same result would have been obtained by making a very wide gateway or by omitting the enclosing wall entirely and allowing proper room for the throat of the loop.

The third type of turn, having the stopping place on the side of the loop, presents similar requirements. A straight section must be introduced on one side but, except for the sake of symmetry, need not be introduced on the opposite side. Fig. 8 shows a symmetrical loop and Fig. 6 represents the unsymmetrical type, the stopping place being at point Y.

The fourth type is really a combination of the foregoing types. Having two approaches requires a loop which may be negotiated in either direction. The stopping place again varies the problem by its relative location. A typical example of this type is shown in Fig. 9.

Although many shapes are required other than those shown, all may be worked out on the basis of these four types. Consideration of the following points in each case will assist in obtaining correct design: (*a*) the elemental curve described by an automobile, (*b*) the reverse curve and its point of straight travel, (*c*) the stopping point and its straight section or tangent, (*d*) the increase in the width of the road in proportion to the sharpness of the turn, and (*e*) the minimum turning radii of automobiles. In most instances the drives on country estates can be worked out with ease if taken when the most preliminary drawings are at hand, but at the seacoast or in the mountains the most ingenious application of layouts will often be needed to overcome contour conditions.

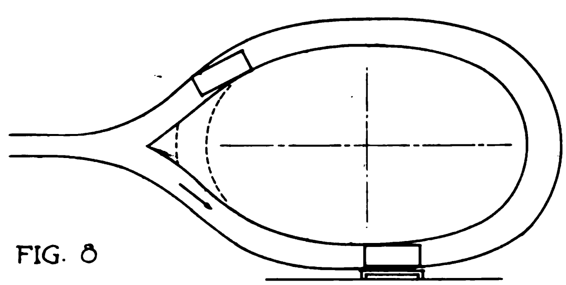


FIG. 8

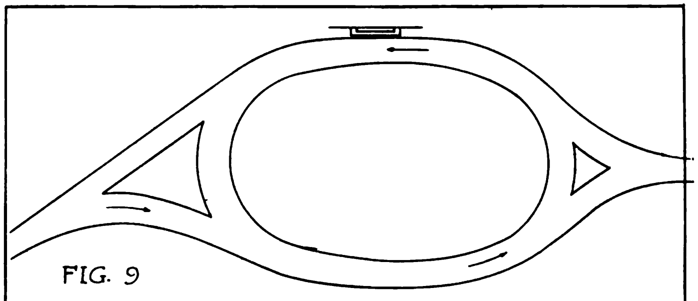


FIG. 9

Sprinkler Installation for Fire Protection

PART I

By W. D. BROWN, C.E.

IN all congested sections of large cities there exists a potential danger of a fire spreading into adjoining buildings. A fire might start under ordinary conditions and, if not discovered in time, get beyond control of the most efficient fire department. Such fires are never controlled by the human element but are extinguished by burning themselves out.

The fact might be emphasized that when there is anything that will burn in a building, no matter how fire resisting or fireproof the building may be, it must be expected that the building will burn out internally if a fire starts; that is, a fireproof building cannot protect its combustible contents.

It is said that ninety-nine out of one hundred fires could be extinguished by a stamp of the foot or a pail of water if discovered in time. This being a fact, it can be readily understood why automatic sprinklers are by far the most important of private fire protection devices.

Automatic sprinklers might be described as mechanical watchmen, located in all portions of an equipped building, the duty of which is to extinguish any and all fires. Unlike the human watchman, automatic sprinklers cannot go to sleep on the job, they do not get excited in an emergency and are not blinded by smoke which means a waste of extinguishing agent and damage to property not affected by fire. Automatic sprinklers are always on the job and a slight rise in temperature causes them to open up, bringing down on the fire a drenching rain, before the small blaze can become a fire of larger proportions.

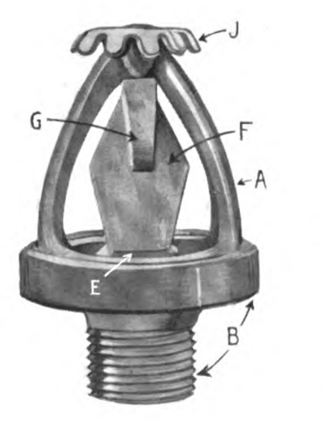
The human element, in case of fire, fails sixty times out of one hundred, while an automatic sprinkler, when properly installed and kept in working condition, has so effectively shown its ability to put out fires that property owners are not now as skeptical as to the value of the investment as formerly when sprinkler systems were first being installed for protection.

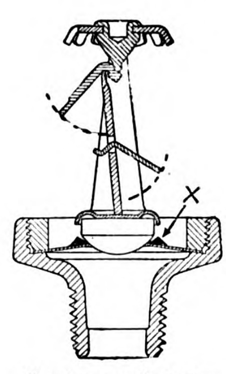
Sprinklers not only prevent interruption of business by fire, which means loss of customers and loss to employees, but their use means a large saving on insurance. One remarkable case may be cited where on an investment of $12,000 for a sprinkler system $4,700 was saved annually.

In general the modern sprinkler head consists of one-half inch orifice, the lower portion connected to sprinkler pipe and "stopped" on top by a disc of some non-corrosive substance, glass, silver or porcelain now being used for this purpose. A few inches from this disc is a deflector or "splash plate." The stopper or disc is secured in place by a series of metal pieces held together by fusible solder and so arranged that they form a strut or brace between stopper and deflector.

Two sprinklers, now being used extensively, are shown. These sprinklers were chosen from the many approved sprinklers as they represent different arrangements of struts and braces. A rise in temperature causes the solder to melt; the struts or braces then spring apart and release the stopper or disc and the water escaping strikes the deflector which breaks it into a shower that effectively extinguishes the fire. (Figs. 1, 2, 3.)

The efficiency and sensitiveness of a sprinkler is illustrated by an occurrence which caused much amusement in a boys' school located in New Hampshire and equipped with automatic sprinklers. A new pupil, having heard about the workings of a sprinkler, decided that he would experiment and discover whether it was a fact that a sprinkler would actually operate in case of a fire. The time of action was chosen to be midnight and the instrument to open the sprinkler was a broom which was set on fire and held at arm's length under the sprinkler. The theory was that after the sprinkler began to operate a hasty retreat would prevent the wetting





Showing struts Springing apart as head goes into action on melting of solder

A Yoke
B — Body
E — Glass Valve
F — Main Strut
G — Hook on Strut
J — Splash Plate

Fig. 1

expected. The silent, mechanical watchman, always on duty, functioned perfectly. It opened up, showering a full 100 square feet with a drenching rain.

It is said that many a well laid plan will go wrong. The truth of this was clearly demonstrated to the boy, who planned to get away without a wetting. He was caught in the first burst of water, which was somewhat dirty as it had remained stagnant in the pipes for a number of years. After the sprinkler opened, a mechanically operated gong on the outside of the building clanged its warning. The boys, trained in fire drill efficiency, filed out of the building to safety. When no fire was discovered an investigation was started. The boy with a pair of white pajamas covered with dirty water was soon found and was glad to confess his part in the deed.

The ordinary or low test sprinkler, used in rooms of normal temperature, has a fusible solder which melts at approximately 160° Fahr.

For rooms which are heated to more than normal temperature a less sensitive solder is used. Sprinkler companies are required to furnish high test sprinklers which will operate at approximately 212°, 286° and 360° Fahr. The importance of getting the right fusible solder in its place can be clearly understood when it is remembered that a high test sprinkler located in a room exposed to normal temperature would require a much greater fire to "open it up." This would allow the fire to get a start and probably open up more sprinklers than necessary, causing an increased water damage.

In case a low test sprinkler were located in a room exposed to a temperature above normal, the sprinkler would fuse without the assistance of a fire and cause water damage. Good engineering requires that an actual test be made of all rooms heated to more than normal temperature to determine which test sprinkler is best suited for its needs.

For the assistance of the inspector, low test sprinklers are not painted. These are used in rooms with a temperature of 100° or less. 212° sprinklers are painted white and used in rooms where the temperature varies from 100° to 150°. 286° sprinklers are painted blue and used for a temperature between 150° and 225°. 360° sprinklers are painted red and are used for temperatures exceeding 225°.

There are places where acid or alkali fumes may corrode sprinklers; among them are plating rooms, stables, bleach rooms, tanneries, paper

Sprinkler Intact

A — Deflector or Splash Plate
B — C — D — E — Struts or Braces
F — Fusible Solder
G — Cup or Stopper
H — Silver Disc under Cap to Prevent Corrosion
I — Part of Frame

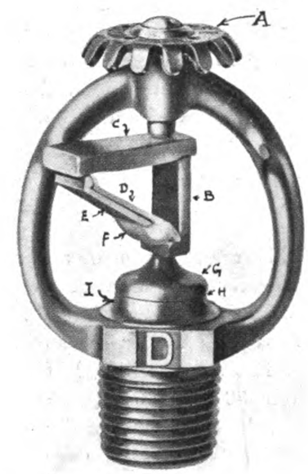


Fig. 2

mills, chemical plants, glucose and starch plants, carbonizing or wool extracting works, dye and galvanizing works and certain rooms in fur dressing or cutting establishments. Moving parts of sprinklers used in such places may get stuck together or the solder may harden until it becomes crystallized and then be easily broken by water.

Various methods have been tried for preventing the corrosion of automatic sprinkler heads, the result being that several prominent sprinkler companies are using, where necessary, wax coated heads which give fair satisfaction. The wax melts at a lower temperature than the solder, so that it should not affect the sensitiveness of the sprinkling apparatus. Glass cups are used by a large sprinkler company with good results, the only disadvantage being a slowing-up action of the sprinkler head. Incrustation of sprinklers often occurs in flour and cement mills, grain elevators, saw mills, sugar refineries and other places where dust is constantly rising. The fine dust soon hardens into a crust about the sprinkler, rendering it inoperative.

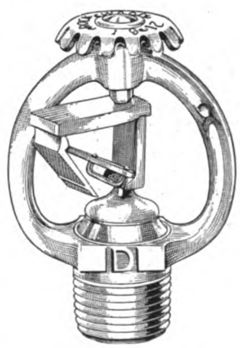


Fig. 3

Above Sprinkler Head going into action. Wire Loop normally embedded in solder prevents it from becoming dislodged except when melted

In rooms where artificial heat is employed for drying purposes, such as oilcloth factories, rubber works, etc., particles of oil and varnish may settle on sprinklers and be baked there by heat, forming a hard coating which impairs the sensitiveness of the sprinklers. Wherever exposed to incrustation, sprinklers should be frequently cleaned or replaced.

Where there is any danger of the efficiency of sprinklers being impaired it is advisable to consider some sort of protection for the sprinkler pipes. Some of the methods used are the painting of pipes and covering them with painted burlap in case of corrosion; painting pipes once a year with red lead and linseed oil or using galvanized pipe which will withstand moisture often affords protection, and graphite paint and rubber tape are used for safety in case of chemical action.

Sprinkler Water Supply

The effectiveness of a sprinkler system depends on water in sufficient volume and with proper pressure, it being understood that a sprinkler has to wet maximum areas (on floors, not ceiling) of from 80 to 100 square feet, depending upon the construction of the ceiling and the hazard of the inside of the building. One pipe supplied from a public main should give a minimum static pressure, day and night, at 25 pounds at highest line of sprinklers.

For a standard equipment, adequate water supply is absolutely necessary; if two supplies are used, one must be automatic and the other must be able to furnish heavy pressure. A public water main is usually used for one supply and in some cities streets are equipped with two pipes, one supplied from high pressure sources and one pipe supplied from low pressure stations. In this case a pipe from each main should be carried into the building, each pipe being equipped with an indicator shut-off valve and a check valve inside the building. The city water departments usually install their own types of valves in the streets. See Fig. 4.

The gate valves are used for shut-off purposes while the check valves are used to prevent the water from high service mains from backing into low service mains, and vice versa when pressure on high service mains is reduced. They are used to prevent stagnant water in sprinkler systems from flowing back into mains, if pressure should be reduced, and then being used for household purposes.

Cities and towns have various rulings relating to fire protection pipes. Some require detector meters on supply pipes, double check valves and limit the sizes of pipes. For example, in Boston the water department rulings require that not larger than 4-inch pipe be brought into a building. Should a larger pipe be necessary additional 4-inch pipes will be carried into a building, providing that they are 40 feet apart.

Fire pumps are frequently used to furnish one water supply to the sprinklers. Good engineering requires that the pump and the pump house should conform to the standard established by the National Fire Protection Association. The pump should draw from a source sufficient to enable it to deliver its full capacity for at least 60 minutes without reducing the level of the water so that the suction lift will not exceed 15 feet.

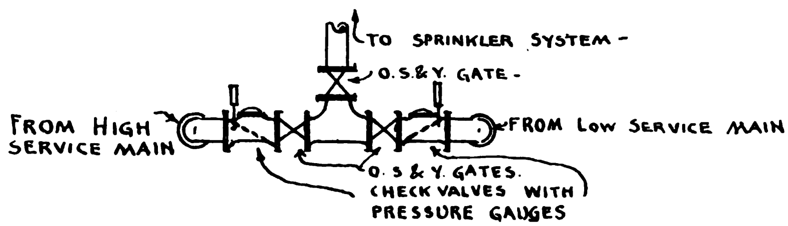


Fig. 4

If the pump supply comes from a body of water which might contain refuse or dirt, a screen or some other protective device should be used to prevent foreign matter entering suction pipes. If suction has a lift of over 15 feet it should be fitted with a foot valve. The only purpose of a foot valve is to shorten the time needed to get the action of the pump under way. A foot valve resembles a check valve, inasmuch as it holds priming water from backing into sources of supply. Gravity tanks are used as sources of water supply where pressure in public mains is low. Tanks are constructed of wood, steel or concrete and are elevated on roofs or trestles so as to give good gravity head where water is to be supplied.

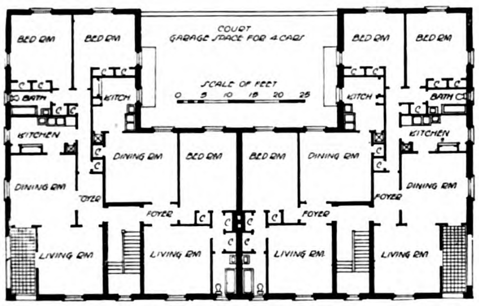
A pressure tank is used as a high pressure water supply. In detail it is a cylindrical steel tank designed to be two-thirds filled with water and the remaining third filled with compressed air. It does not need the heavy construction and the great elevation necessary for a gravity tank, but can be located inside of a building on a floor already constructed, in a penthouse or in any location not exposed to freezing weather.

Apartment Houses at Jackson Heights, N. Y.

AN EXAMPLE OF CO-OPERATIVE FINANCING BY TENANTS

ANDREW J. THOMAS, ARCHITECT

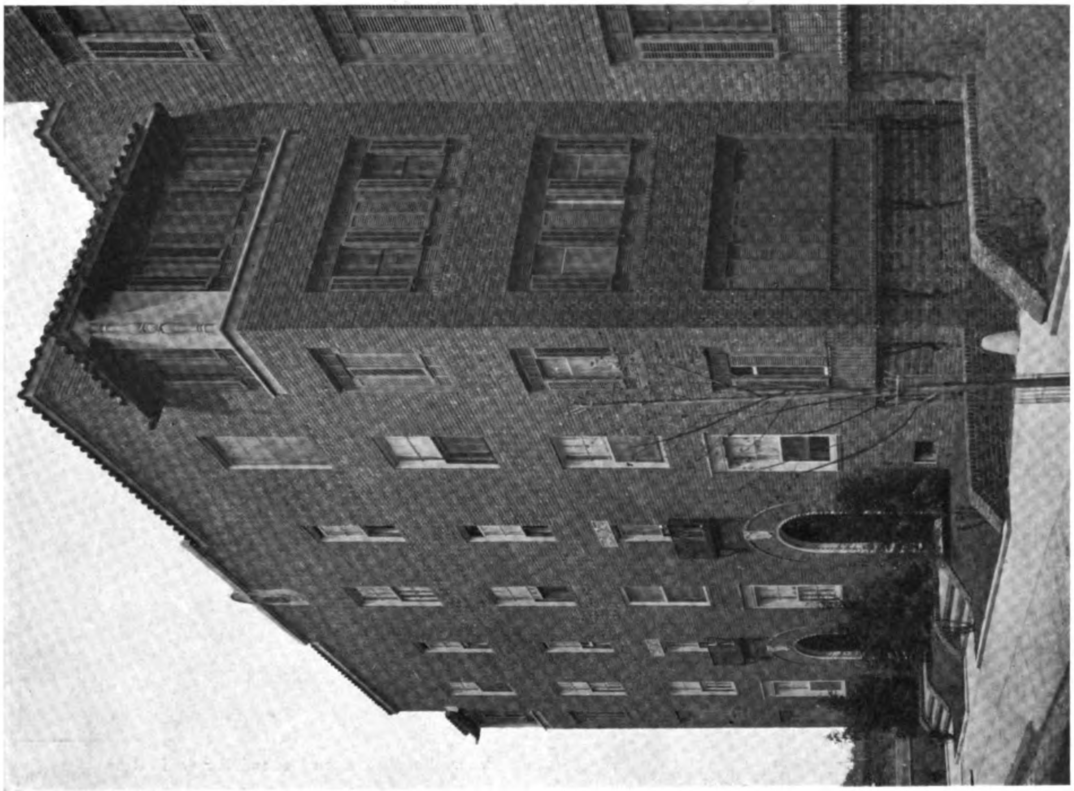
THIS group contains ten buildings, comprising in all 128 apartments. There are three units, with frontages of 83, 107 and 120 feet, respectively. A special point of interest is the openness of the plan; larger courts have been provided, yet the same amount of rental area is obtained as in apartments that cover greater ground area. The buildings have just been completed and the majority of the apartments have already been sold to tenants on a co-operative basis. A detailed discussion of the planning of this group was published in THE FORUM, *June, 1919.*



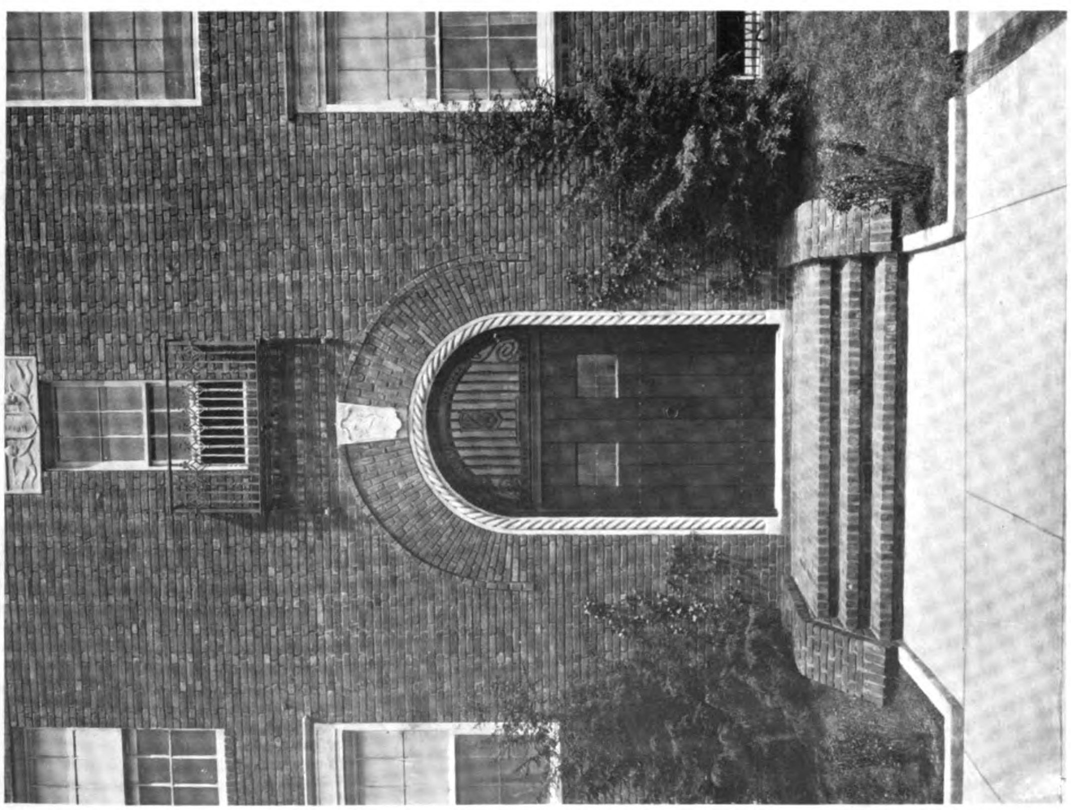
Typical Plan of 107-foot Unit

View Showing Garden Plot and Garages in Rear

Street Façade of 107-foot Unit of Apartment House Group



DETAIL OF FAÇADE AND SUN PORCHES



DETAIL OF ENTRANCE DOORWAY

GROUP OF CO-OPERATIVE APARTMENT HOUSES AT JACKSON HEIGHTS, NEW YORK, N. Y.

ANDREW J. THOMAS, ARCHITECT

ARCHITECTURAL & BUILDING ECONOMICS DEPARTMENT

C. STANLEY TAYLOR, *Associate Editor*

Co-operative Ownership to Meet the Present Shortage of Buildings

II. THE DEVELOPMENT AND FINANCING OF A CO-OPERATIVE BUILDING PROJECT TO-DAY

IN past years the co-operative apartment house project has been developed for reasons other than those which now promise a rapid growth of interest in this method of bringing about the construction of buildings necessary to meet the housing shortage. The reasons in the years before the war for the development of co-operative ownership were especially ascribed to the rapid increase in land values in sections of the city desirable for downtown residential purposes, and the interest of certain individuals, particularly artists, in developing, on a community basis, buildings containing special features designed to meet their requirements.

Thus we find that the average co-operative apartment in the early stages of its development in America consisted of a number of units of the studio type, together with service space and community rooms, such as picture galleries, dining rooms, lounging rooms, open to the use of all tenants and their friends.

Gradually, however, as the servant problem became more troublesome and business buildings began to crowd out the old downtown residential sections, there developed a demand for downtown apartments for the families of business men, and for what might be termed a dilettante class whose interests were chiefly in the artistic and theatrical centers.

Thus we find a second development of co-operative apartments not especially designed as studios but developed more as comfortable living quarters where the maintenance difficulties of the average city dwelling were eliminated, and where better living quarters could be obtained for less money than through ownership of a separate dwelling in the same district.

To-day we have not only these same conditions, all in an aggravated state, but we have also the very practical questions of high building costs, difficulty in obtaining building financing, and a gradual withdrawal of speculative and investment interests from the field of new buildings, all coupled with a constantly increasing housing shortage. One phase of the present-day situation was recently described by a prominent New York real estate expert in a statement that a plan has been worked out for a Fifth avenue apartment house in which a $27,000 a year apartment at the normal rental can be had for a little under $13,000 a year, taking into consideration a saving in income tax through the ownership of an apartment, provided an investment is made on a co-operative basis as follows:

Of the twenty-four apartments in this building, six will be sold at $100,000 each, the remaining eighteen being offered for rent at market prices. The total rentals on these apartments will pay the interest on mortgages, taxes and the operating cost of the building, so that a man would be able to secure an apartment, the rental value of which would be $15,000, at a total annual cost of $6,000.

He draws the conclusion, however, that only persons of wealth can enjoy the advantages accruing from the co-operative method of building ownership, and if this has been the general impression it will be one of the purposes of this article to show not only the practical methods through which the financing of a co-operative project may be developed, but also that the application of this principle is basic, and that it need not be confined entirely to people of wealth but is available to all who may have savings to invest in a home. It is safe to assume that the growing interest in this type of building finance is not entirely due to the conditions of past days, as already described, but is due largely to the possibility of eliminating considerable excess profit and making a dollar buy more housing space directly available for the tenant than is possible through the usual speculative and investment development of buildings.

We are therefore to-day facing these changed conditions in considering this project:

1. That building costs are probably two and one-half times increased over a pre-war period.

2. That land has not increased so greatly in value.

3. That it is more difficult to obtain building loans.

4. That the development of the co-operative project is not to-day so personal a matter as in the past, but is usually carried out by interested individuals who will profit by some phase of the transaction which comes within the scope of their business activity.

5. That an architect, a builder or a landlord may be the active means of developing a co-operative project to a point where benefit may be received by all persons interested.

Assuming that a stock company is formed for the purpose of providing the necessary equity, we find a possibility of admitting to the advantages of co-partnership those who may not have sufficient funds to buy stock outright. A plan has recently been worked out by several building corporations through which the purchasers of stock are required to make a first payment, and allowed several years in which to pay for stock on the installment plan at the same time occupying their apartments. The actual equity financing in such cases is done by the building corporation or by others primarily interested, and their money is returned to them by the installment payments of the actual purchasers of stock who are living in the building.

Thus we find in a recent prospectus for a large project of this nature that the financing and selling have been carried out as follows:

The Cost

In order to facilitate the comprehension of the plan, the cost of the building is made up as follows:

1. The cost of the land, with all street improvements, at a very low price.
2. The estimated cost of the buildings.
3. A profit of 10 per cent on the cost of land and building.

This cost represents about $1,430 per room of which $805 represents a mortgage and $625 is the equity; as an illustration, therefore, a 6-room apartment would cost to acquire $3,750 over and above its proportionate share of the mortgage, which would be about $4,800 additional. The cost of the 4- and 5-room apartments is in proportion. The prevailing fair market rent is paid for the apartment and the saving over the actual expenses of operation is returned in the form of dividends.

Stock

Each building which is sold will be incorporated with a stock capital equivalent to the amount of the equity above the mortgage. As an example, the 83-ft. building would be incorporated for $35,000, the mortgage on this building would be $45,000 and the total cost $80,000. The $35,000 of capital represents $625 for each room in the building. The stock can be paid for in cash or part cash and part installments over a period of six years as shown in detail hereafter. It is conservatively estimated that this stock should earn 8 per cent. Figures which are appended give the schedule of rents and the estimated income and outgo of the various buildings. Each stockholder will be a director sharing in the management.

Installment Payments

Under the installment plan of paying for stock (shown in detail hereafter), 6 per cent is charged on unpaid balances, but the stockholder will receive the full earnings on his stock while he is paying for it, which is estimated at 8 per cent. The stock is held or retained by the holding company as collateral security until paid for. Interest on unpaid balances is payable quarterly, installments monthly and dividends semi-annually.

Amortization of Mortgage

In addition to the 8 per cent dividend on the stock an allowance of 2 per cent of the amount of the mortgage is set aside out of the earnings to gradually pay off the mortgage on the property.

Management

The corporation is to act as agent and manager for the houses for a period of seven years, rendering semi-annually an itemized statement to the tenant-owners of the cost of maintenance and performing clerical work in connection with the holding corporation, charging for this service 5 per cent of the gross rent during that period.

Share in Building Separate from Tenancy

At the time of vacating the premises the shareholder may either retain his share in the building or sell it, which, of course, he is at liberty to do at any time. The assignment of the share in the building, however, does not carry with it the right, to the new buyer, of leasing the apartment; all prospective lessees are to invariably be passed upon by the holding corporation or its agent.

Leases

Each shareholder will receive a lease in the form used by the corporation which will insure him of permanent occupancy of his apartment at present rent so long as he wishes to occupy it, — with a provision that by giving notice on the 1st of July in any year he may vacate the lease the following October 1st, in which event the apartment will be let to a new tenant for the benefit of all the stockholders at the then prevailing schedule of rent.

Choice of Apartments and Selection of Owners

Choice of apartments will be given in the order of receipt of application. The corporation will exercise the utmost care in selecting the prospective owners of apartments.

Payments

A deposit of $200 will be required with each application for an apartment and 6 per cent interest will be allowed on each deposit from the date of its receipt. The balance of the cash payment is to be made at the time of passing of title.

This plan shows how co-operative interest-carrying tenancy of an apartment may be purchased on an easy-payment plan with a small first cash investment. That this plan has proved a success is shown by the fact that on the operation just described all of the apartments provided were sold, and this method of selling direct from builder to tenant at cost plus a moderate profit is evidently to be one of the successful methods used during the next few years.

As just outlined, it is not only possible to develop a co-operative project but it is possible to place the stock interest in this project with owner-tenants who have not the entire amount necessary available in cash, but who are willing to pay a rental comprising cost of operation and interest plus a sufficient amount of cash monthly to complete the installment purchase of their stock. This method places the co-operative plan in the hands of the masses and at the same time gives the speculative builder who is willing to take a normal profit an excellent opportunity to sell his buildings piecemeal rather than to be forced to depend upon the luck of the market to find an investor at today's high costs.

Returning to the general phases of the situation we find that coupled with high building cost is the condition of extreme necessity for housing and the increased ability of the average person to pay for his house. While it is true that there is a definite shortage of money for building loans, it is also true that the co-operative project developed along proper lines is more interesting to the building financier than the average straight building loan,—partly because there is greater responsibility to be found in a group of owners under this plan, and also because it is possible under this plan to make mortgage loans, a portion of which will be amortized annually.

This question of high cost also brings up the point of a sinking fund, not only to pay off a proportion of the mortgage, but to definitely counteract a possible shrinkage in replacement values. Thus in planning a co-operative venture the financing and general administration should be worked out somewhat along these lines:

1. A complete prospectus of the project should be worked out with floor plans and elevations of the building, together with a careful estimate of cost and of rentable values.

2. The project should be taken up for financing:

(*a*) With a loaning institution or individual; or, if money is not obtainable, through ordinary sources,

(*b*) With an underwriter of realty mortgage bonds; there are many companies which will underwrite a good mortgage and through their selling channels will place bonds with investors.

3. When the general plans and mortgage arrangements have been worked out the actual prospectus can be taken up with stock investors who are to be tenants. In this manner a percentage of the space in the building will be set aside for investors, usually allowing a certain number of square feet or cubic feet in the building in proportion to amount of stock purchased, the capitalization of the company being based on the necessary equity.

COST OF EACH APARTMENT AND INSTALLMENT PAYMENT

Sizes of Suites	Approximate Share Mortgage Each Apartment	Value of Equity at $625.00 per Room	Cost of Apartment	Minimum Cash Payment	Balance Payable by Installments in 6 Years	Annual Payments for 6 Years	Monthly Payments for 6 Years
6 Rooms.	$4,800.00	$3,750.00	$8,550.00	$1,500.00	$2,250.00	$375.00	$31.25
5 ,,	4,000.00	3,125.00	7,125.00	1,250.00	1,875.00	312.50	26.04
4 ,,	3,200.00	2,500.00	5,700.00	1,000.00	1,500.00	250.00	20.83

RENTAL OF EACH APARTMENT

Location	6-Room	6-Room	5-Room	5-Room	4-Room 120-Ft. Building		4-Room 83-Ft. and 107-Ft. Buildings	
	Month	Year	Month	Year	Month	Year	Month	Year
1st Floor........	$92.00	$1,104.00	$77.50	$930.00	$64.00	$768.00	$58.00	$696.00
2d ,, ...	98.00	1,176.00	82.50	990.00	68.00	816.00	62.00	744.00
3d ,, ...	98.00	1,176.00	82.50	990.00	68.00	816.00	62.00	744.00
4th ,, ...	92.00	1,104.00	77.50	930.00	64.00	768.00	58.00	696.00

COST TO PURCHASE AND RENT EACH APARTMENT
(Minimum Cash Payment 6-Year Installment Plan)

	6-Room Apartment		5-Room Apartment		4-Room 120-Ft. Building		4-Room 83-Ft. and 107-Ft. Buildings	
	1st and 4th Floors	2d and 3d Floors	1st and 4th Floors	2d and 3d Floors	1st and 4th Floors	2d and 3d Floors	1st and 4th Floors	2d and 3d Floors
Annual Rent....	$1,104.00	$1,176.00	$930.00	$990.00	$768.00	$816.00	$696.00	$744.00
Installment	375.00	375.00	312.00	312.00	250.00	250.00	250.00	250.00
Average Int. on Unpaid Balance	66.00	66.00	56.00	56.00	45.00	45.00	45.00	45.00
Gross Cost......	1,545.00	1,617.00	1,298.50	1,358.50	1,063.00	1,111.00	991.00	1,039.00
Est. Dividend, 8 Per Cent......	300.00	300.00	250.00	250.00	200.00	200.00	200.00	200.00
Net Cost	1,245.00	1,317.00	1,048.50	1,108.50	863.00	911.00	791.00	839.00
Gross Cost per Month.........	128.75	134.75	108.20	113.20	88.58	92.59	82.58	86.58
Net Cost per Month........	103.75	109.75	87.37	92.33	71.91	75.91	65.91	69.91

In figuring rental income from the space which is to be rented directly, not only maintenance cost should be liberally figured, together with vacancy loss and other contingencies, but a definite sinking fund of 2 or 3 per cent of the cost of the building should be set aside as part of maintenance cost; this fund is to accrue to the benefit of the stockholders in the building and is to be used to offset any shrinkage in replacement value which may come when the cost of building is lower.

In view of the demand for good rentable space to-day it is not difficult to obtain rents sufficiently high to meet all costs of maintenance, together with a necessary sinking fund for replacement value.

4. As stock subscriptions are taken, preliminary payments should be obtained which will be sufficient to bring to completion all working drawings and specifications for the building which should then be placed for final detailed estimate with the builder.

At this point the unusual conditions of to-day's market present a problem, and that is to ascertain the definite cost of the building. Stockholders who enter into a co-operative building project to-day must realize that the definite cost of the building cannot be ascertained until construction is complete. The promoters of the operation will find it almost impossible to get a reputable contractor to give a definite contract figure, and it will, therefore, be necessary in most cases to retain the services of an expert builder of structures of this type on a fixed fee basis, with penalty and bonus clause affecting his fee in proportion to the saving or excess in cost of the building as related to final detailed estimate.

This is a point which, to a certain extent, has hampered the development of new co-operative buildings; but, on the other hand, the obvious saving features of this method, as opposed to renting space in new buildings, are such that those who are facing a pressing demand for living or business quarters will not hesitate to risk any reasonable excess cost.

5. The project at this time will have reached a point where actual building commences and stock payments are required from stock purchasers at various stages in the progress of the building operations.

There are many points which come up for discussion in relation to a project of this nature, and on which the minds of interested persons are not clear. It is difficult in an article of this nature to discuss all the points which may arise in this connection. There are, however, some questions which will naturally be asked, together with replies which form the consensus of opinion of persons experienced in this type of building development and such replies may be helpful in removing misunderstandings.

Who Handles Finances and Assumes Business Responsibility?

The most successful method is to place the entire handling of the project in the hands of a real estate management company experienced in such work. They will be responsible for all rental collections, maintenance and disbursements, and will make statements to a committee of the owners. This committee, in turn, makes a statement to the individual owners as to gross income, expenses, dividends, amortization payments and sinking fund allotments.

Must an Owner Occupy His Apartment?

No. The owner under to-day's conditions will probably gain the greatest benefit by occupying the apartment. He should, however, be in a position to sub-let the apartment at any rental equal to or above the average rental imposed throughout the building. The tenant must be acceptable to the owners' committee, however. Similarly, if an original owner sells, the buyer must be acceptable to the committee. For instance, in the case of one co-operative apartment building erected some years ago in New York, the owner of an apartment having gone abroad rented the apartment on a basis which pays him an annual cash return of about 15 per cent on his investment. Incidentally, the value of land and building has increased to the point where he could sell his apartment to-day at 100 per cent over what it cost.

Is Stock in This Type of Investment Negotiable Collateral?

Stock in this type of investment, which carries with it a perpetual lease to a definite space in the building, is certainly negotiable collateral under the conditions imposed by the agreement. It is in no way different from the ownership in an individual property. Thus if it is shown that there is a definite equity in this holding, and that this investment is paying a good return, either in market rentable value, or in actual rental if the owner is not occupying the apartment, this constitutes sound collateral in exactly the same manner that a mortgaged dwelling is collateral. It has the same collateral security value and the same transferable market value as a dwelling subject to occupancy restrictions. An owner should experience no difficulty in selling his stock holdings at any time there is a reasonable demand for space. During the next few years stock ownership should prove a valuable asset because of the definite advantages it entails.

What Are the Advantages to be Gained —

(*a*) *As opposed to the ownership of an individual dwelling?*

1. Co-operative ownership is wholesale buying of building space, eliminating land and building increment profit, speculative profit and financing profit.

2. If the owner lives in the apartment, he has none of the responsibilities of property management or the difficulties of maintenance necessary in an individual dwelling.

3. He has the advantage of living in a community where land cost would be prohibitive for an individual dwelling.

4. He has the privilege of selecting the type of his neighbors.

5. He has none of the disadvantages of a tenant subject to the whims or profiteering tendencies of a landlord.

6. He is, in fact, a landlord receiving benefits from space rented out by him at market values, the profits on which go to reduce his own rental.

(*b*) *As opposed to renting an individual apartment?*

1. He pays none of the excess cost due to speculation, financing, income tax, property charges, profiteering, etc.

2. He is not subject to eviction.

3. He can deliberately choose his neighbors.

4. He enjoys a definite financial saving due to the conditions here described and consequently can occupy at the same actual annual cost a much larger and more desirable space than his income would permit on a straight rental basis under today's conditions.

A Definite Example of Co-operative Apartment Purchase

IN connection with co-operative apartment financing it will be interesting to cite as an example the experience of an architect who purchased, as a personal investment, stock in a co-operative apartment house.

The apartment house in question was a 7-story building, 90 by 100 feet, located in New York and containing 14 apartments of 7 rooms and 3 baths each, and 14 apartments of 4 rooms and 3 baths each. This building was developed by a promoting company receiving a promoter's fee which was added to the cost of the building. A stock company was formed representing the ownership of the equity in the building and stock was sold carrying permanent leases to half the apartments in the building.

Thus stockholders held the leases of 14 apartments, leaving 14 apartments to be rented at prevailing rentals in order to cover carrying charges. The equity in this building worked out so that the large apartments were sold for $8,500 and the small apartments $4,500. Of this amount 10 per cent was payable before the construction of the building, and upon the signing of the stock application, while the balance was payable in the same manner as a building loan, 20 per cent at each of various periods during construction until the final payment was made when the building was completed.

The architect in question purchased stock entitling him to a permanent lease on one of the larger apartments. His investment was $8,500 and to this he added $1,500 to be expended for unusually good decorations and electric refrigerator and other additional improvements. As he did not wish to occupy the apartment, he exercised the privilege accorded to all purchasers in co-operative ventures of leasing his apartment for a considerable number of years to a tenant acceptable to the owners' committee.

At the time of purchase the established rental of an apartment of this type in the neighborhood in question was $1,700 a year. The owner's rental, when the building was completed, was estimated at 40 per cent of this amount, or about $700, which was subsequently increased to $1,020 annually in order to effect the retirement of part of the mortgage. At present the owner of this apartment is paying an owner's rent of $1,020, but is receiving from his tenant a rental of $2,800 on his lease which still has about two years to run. It is interesting to note that the apartment on a lower floor in the same building, being exactly similar in design, is now renting for $4,500 a year.

This has proved an excellent investment, as the profit to the owner of the apartment is over $1,700 a year on an investment of $10,000. If rented at prevailing figures, the profit would represent 30 per cent of the investment. Consequently the actual value of this apartment has increased with the increased value of the building to a point where it is easily salable at twice the amount invested.

This building has operated smoothly over a period of years. Directly in charge of its operation and maintenance is a committee of owners who, in turn, have placed the management of the building and the collection of rentals in charge of an established agency which reports monthly and renders a financial statement every three months.

Elements of Increased Building Cost

ONE of the difficult features in dealing with clients in architects' offices to-day is the almost incredulous amazement with which they receive information as to the actual increase in the cost of building. In answering the resulting questions the architect is called upon to have ready reference as to increased cost in various types of materials and in labor.

A special report recently submitted by Mr. Charles A. Chase, a member of the sub-committee on building of the Mayor's Housing Conference Committee of New York, is of particular interest in that it carefully itemizes the actual increase in cost of various items. It is presented herewith:

Table Showing Schedule of Wages and Percentage of Increase in Building Trades, 1914-1920

	Amount per Hour 1914	1920	Per Cent of Increase
Auto truck drivers	$0.46⅞	$0.75	60
Bricklayers	.75	1.25	66⅔
Bricklayers' laborers	.37½	.87½	133⅓
Bluestone cutters	.56¼	1.12½	100
Bluestone laborers	.37½	.78⅛	108⅓
Bluestone yardmen	.28½	.78½	177¾
Carpenters	.62½	1.12½	80
Carpenters' laborers	.25	.62½	150
Common laborers	.18¾	.75	300
Cement finishers	.62½	1.12½	80
Cement laborers	.37½	.75	100
Engineers in stone yards (per week)	25.00	42.00	68
Electricians	.60	1.12½	87½
Electricians' helpers	.27½	.68¾	150
Elevator constructors	.80	1.12½	40⅝
Elevator constructors' helpers	.62½	.87½	40
Freestone cutters	.68¾	1.12½	63⅝
Freestone planermen	.56¼	1.00	77⅘
Freestone sawmen	.40⅝	.78⅛	92⅓
Freestone laborers	.37½	.78⅛	108⅓
Freestone setters	.75	1.25	66⅔
Freestone derrickmen	.50	1.00	100
Freestone carvers	.81¼	1.25	54
Granite cutters	.56¼	1.12½	100
Granite laborers	.37½	.78⅛	108⅓
Iron workers	.62½	1.12½	80
Iron workers' helpers	.43¾	1.00	128½
Marble cutters and setters	.68¾	1.12½	63⅔
Marble carvers	.75	1.25	66⅔
Marble polishers	.56¼	1.66¼	89
Marble cutters' helpers	.43¾	.87½	100
Mosaic and terrazzo workers	.56¼	1.00	77⅘
Mosaic and terrazzo helpers	.34⅜	.81¼	136⅓
Metal lathers	.68¾	1.25	82⅘
Plasterers	.75	1.25	66⅔
Plasterers' laborers	.37½	.87½	133⅓
Painters	.62½	1.12½	80
Plumbers	.62½	1.12½	00
Plumbers' helpers	.25	.50	100
Plumbers' laborers	.25	1.00	300
Roofers	.62½	1.12½	80
Roofers' helpers	$0.25	$0.62½	150
Stone masons	.62½	1.25	100
Steam fitters	.68¾	1.12½	63⅔
Steam fitters' helpers	.37½	.87½	133⅓
Sheet metal workers	.62½	1.12½	80
Tile setters	.75	1.12½	60
Tile setters' helpers	.37½	.75	100
Team drivers	.37½	.62½	66⅔

Table of Increased Percentages in Cost of Principal Building Materials, 1914-1920

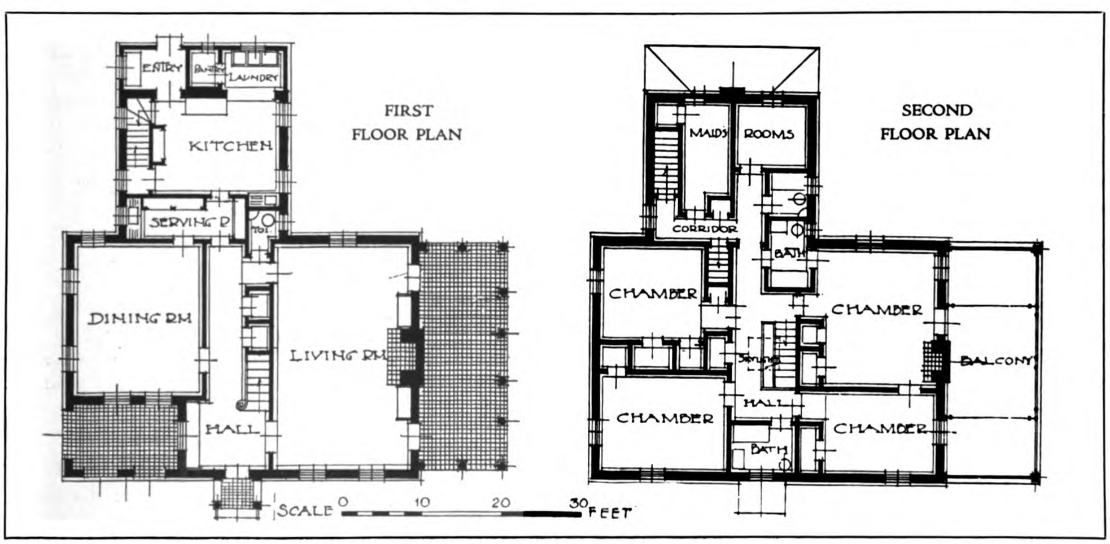
Material	Per Cent	Material	Per Cent
Dressed chestnut	366⅔	N. C. roofers	226
Dressed plain oak	366⅔	N. C. underfloor	237½
Dressed hazel	361⅛	Clear quartered oak floor	263⅔
Dressed whitewood	350	Y. P. steps	200
Dressed cypress	330	Plain oak flooring	266⅔
Dressed white pine	300	Maple oak flooring	380
Maple oak flooring	380	Electric lighting fixtures	125
Plate glass	300	Electric wiring	125
4-inch C. I. fitting	351	Trim hardwood	150
28-gauge galvanized	319	Trim softwood	100 to 120
Clear maple flooring	353⅘	Birch doors	110
Y. P. flooring	312½	Fir and cypress door	100
Clear plain oak floor	314	Sash	100
Tiles	200	Sheet glass	100
Hardware	200	Wire glass	150
Granite	250	Boilers	160
Steel	200	Pipe	140
Parquet floors	200	Excavation	100
Radiators	250	Enamel sink	187½
Fittings	225	Enamel bath	193
Lead bends	237	Enamel basin	194
Lead traps	255	Soapstone wash trays	147
Galvanized boilers	254	Lead	138½
Washdown W. C.	255	Oil	153⅓
Turpentine	300	Varnish	114²⁄₇
Vermont marble	200	Soft sheet copper	100
Tennessee marble	175	Wire glass sized	191¾
Italian marble	125	Ribbed glass	181
Cold rolled copper	100		
Slate	200		

The general increase in percentage of cost of building materials since 1914 is as follows, based on prices at that time:

June, 1915	3 per cent
June, 1916	10 per cent
June, 1917	23 per cent
June, 1918	55 per cent
March, 1919	66 per cent
July, 1919	57 per cent
August, 1919	82 per cent
September, 1919	83 per cent
October, 1919	90 per cent
November, 1919	92 per cent
December, 1919	114 per cent
January, 1920	120 per cent
February, 1920	126 per cent
March, 1920	130 per cent
April, 1920	140 per cent

The House of Pierre Jay Wurts, Esq., Englewood, N. J.

HAYS & HOADLEY, ARCHITECTS



EDITORIAL COMMENT

THE SITUATION CONFRONTING BUILDING

THE first four months of this year exhibited abnormal activity in building construction which was particularly evident in the field of industrial work. A reaction has now set in which is quite general throughout the country and there appears a definite intention to curtail building. At first thought it may seem detrimental to the building industry that any lessening of activities should occur but, upon analysis, there appear certain definite advantages in such a policy.

There have in the past few months been absolutely no standards that would serve to govern the price or speed with which construction work might be carried on. Large building contracts were put under way in the face of a great shortage of material and serious difficulties in transportation, with the result that prices of materials, already high, climbed to new heights under the pressure of demand. Building labor, depleted in a large measure by the employment of many building mechanics in other industries, and strongly organized, was given the opportunity of breaking contracts and enforcing the payment of outrageously high wages due to the general demand for their services. The combination of these three cost increasing elements gradually developed a situation in building which was not looked upon as desirable by financial institutions, and with the Federal Reserve Board's insistence on the curtailment of credit expansion, financial support for building has been largely withdrawn in many centers.

These are the factors that have brought about the difficulty; and while diminished activity is not usually looked upon as a happy prospect, there is promise that out of the present situation will come several adjustments that will mean better and more stable conditions. The very great demand for buildings has in no measure been met by the construction now under way. In the face of a general demand it is not reasonable to suppose that activity will long be withheld if conditions are in any way favorable for construction.

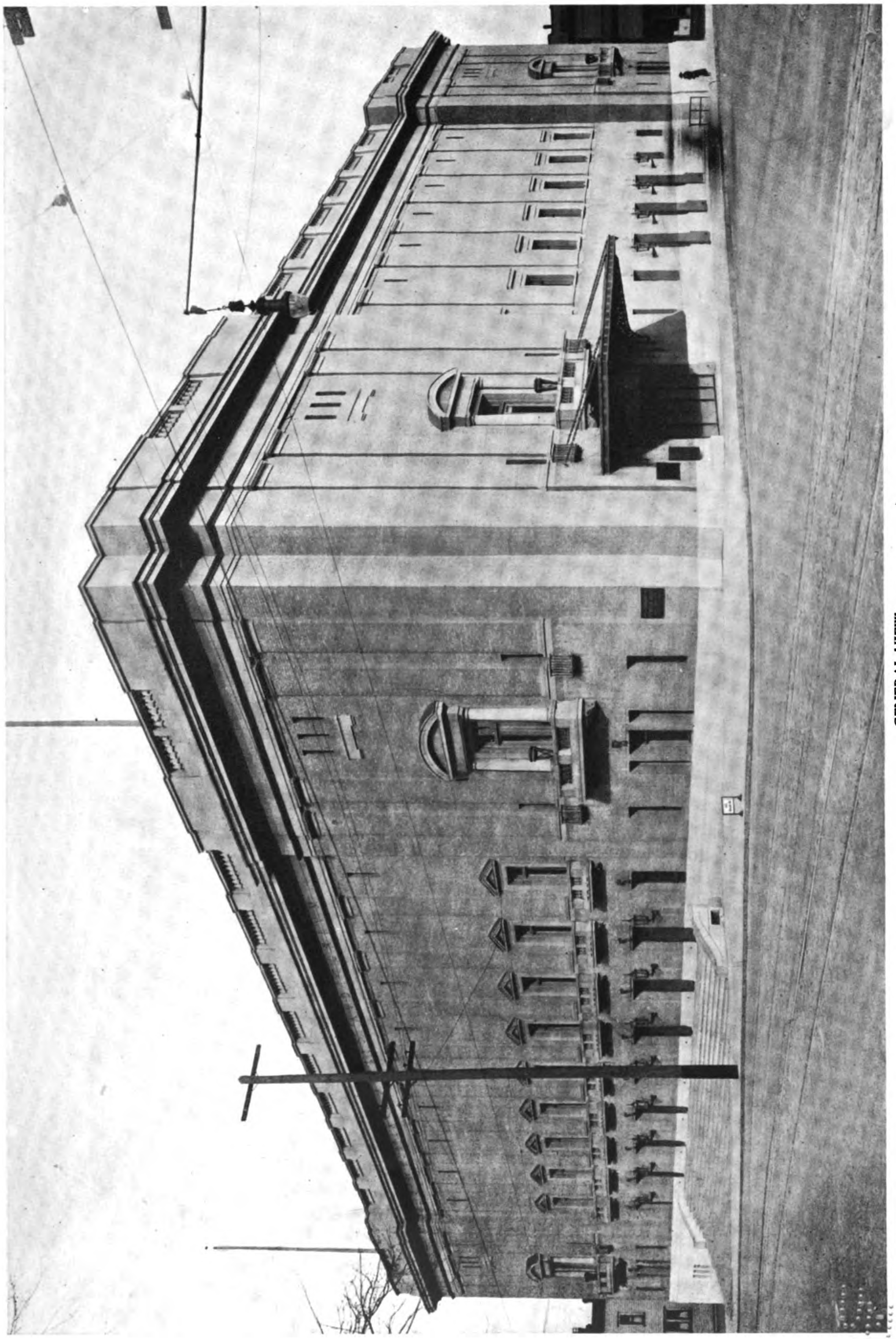
In the material manufacturing field the biggest element of distress is the inadequacy of transportation. It matters little how much is done in the way of increasing production if distribution cannot be had, and at the time of this writing the building material interests are suffering under what amounts to an embargo against building materials by the priority ruling of the Interstate Commerce Commission which assigns to the use of coal producers all of the open top freight cars for a period of two months ending August 21. These are the cars that are needed also to ship materials that are wanted for necessary highway and building construction. With this preferential ruling to the coal producers the distribution of building supplies is practically brought to a full stop. There is undeniably a shortage of coal in many sections of the country and it is important that the deficiency be made up; but while the domestic shortage continues, even under the present favorable shipping arrangements, the tonnage figures of coal exported steadily increase. The building material people can very rightfully consider that they are being discriminated against and in their efforts to have the ruling rescinded they should be given the vigorous support of every one interested in the welfare of the building industry. During the war every citizen was willing to make sacrifices for the common good and priority rulings and other orders were accepted as necessary, but to-day the need for autocratic measures does not exist and one industry should not receive preference from the government at the expense of others no less essential.

The process of deflation which is slowly developing through the curtailment of credit is, of course, being felt in lines other than building. The extravagant demand of the public for all types of merchandise rather suddenly came to an end, with the result that dealers were caught with large, high priced stocks, orders for future deliveries were canceled and requests from the banks for reduction of loans brought about sharp cuts in prices in order to liquidate stocks. The activities in such basic commodities as wool, cotton and leather have been greatly reduced and manufacturing plants using these raw materials are running on short time or closed down entirely. This is releasing many workers who formerly were engaged in the building trades and the effect is that the extreme shortage of help in the building industry is gradually being changed to a reasonable surplus. This will have a steadying effect on building labor because, irrespective of the great value the workers place upon their strongly organized position, their success in gouging high wages in return for minimum production has not been due essentially to their organization but to the natural law of supply and demand. With demand decreasing and supply increasing we may expect to see gradually come about an enforced change in their attitude. There is already in evidence a strong movement among employers in the building trades to bring about open shop conditions in centers that have been union ridden, and if the present slack in building is responsible for nothing else than bringing labor down to earth, any resultant sacrifice will have been wisely made.

DETAIL OF ENTRANCES ON MAIN FACADE

PORTLAND PUBLIC AUDITORIUM, PORTLAND, OR

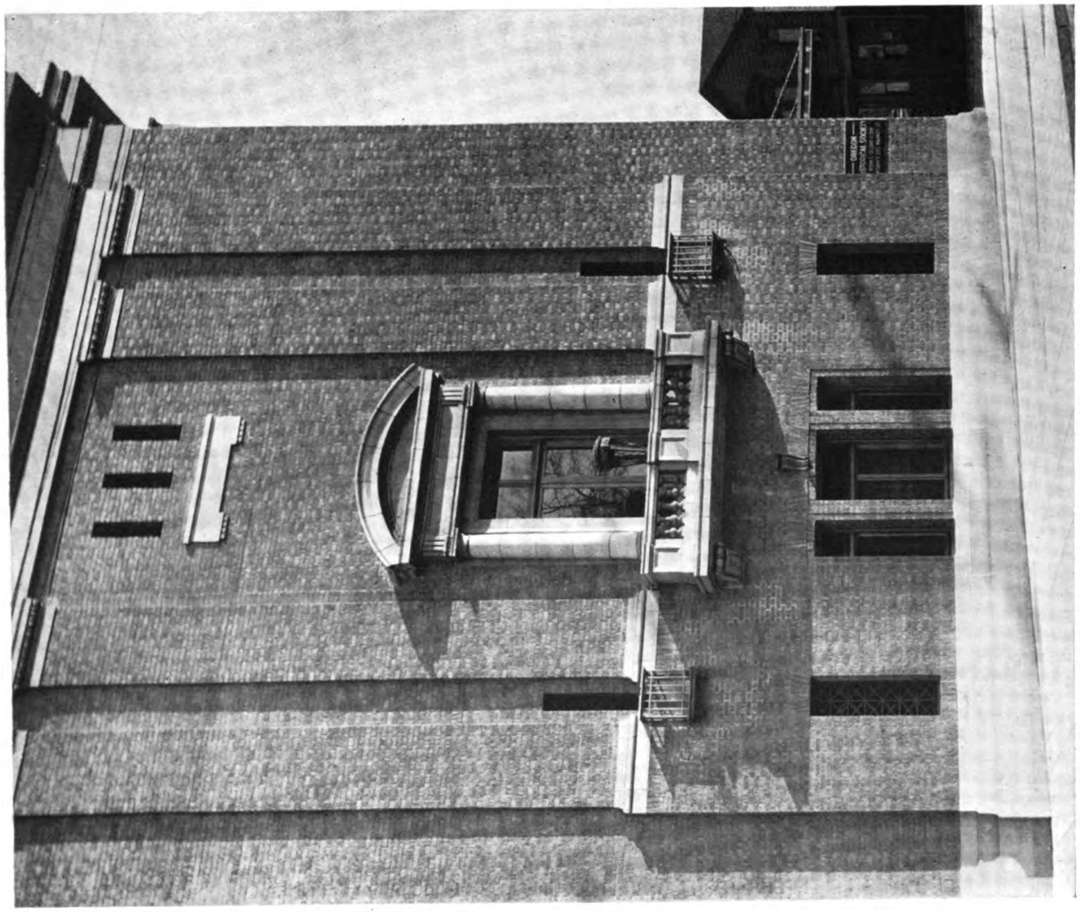
J. H. FREEDLANDER, A. D. SEYMOUR, JR., ASSOCIATE ARCHITECTS



GENERAL VIEW

PORTLAND PUBLIC AUDITORIUM, PORTLAND, ORE.

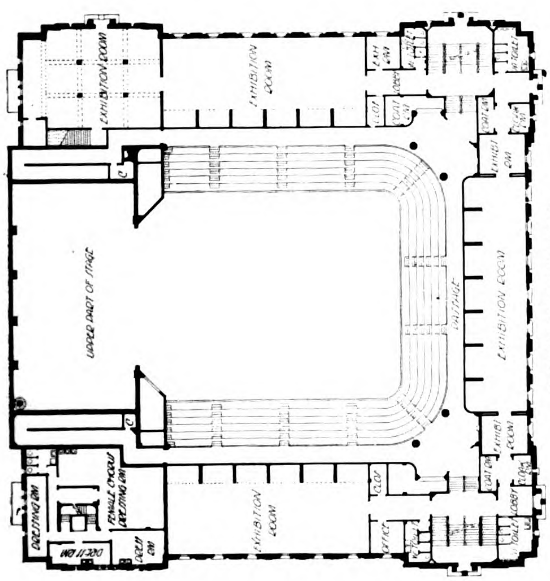
J. H. FREEDLANDER, A. D. SEYMOUR, JR., ASSOCIATE ARCHITECTS



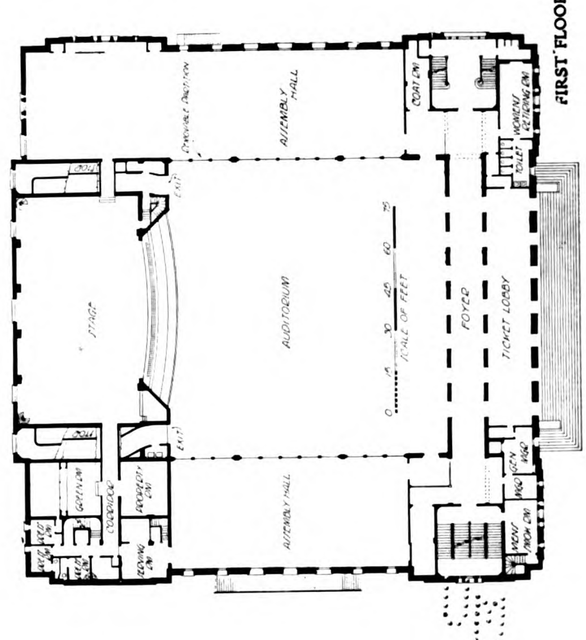
DETAIL AT END OF MAIN FACADE

PORTLAND PUBLIC AUDITORIUM, PORTLAND, ORE.

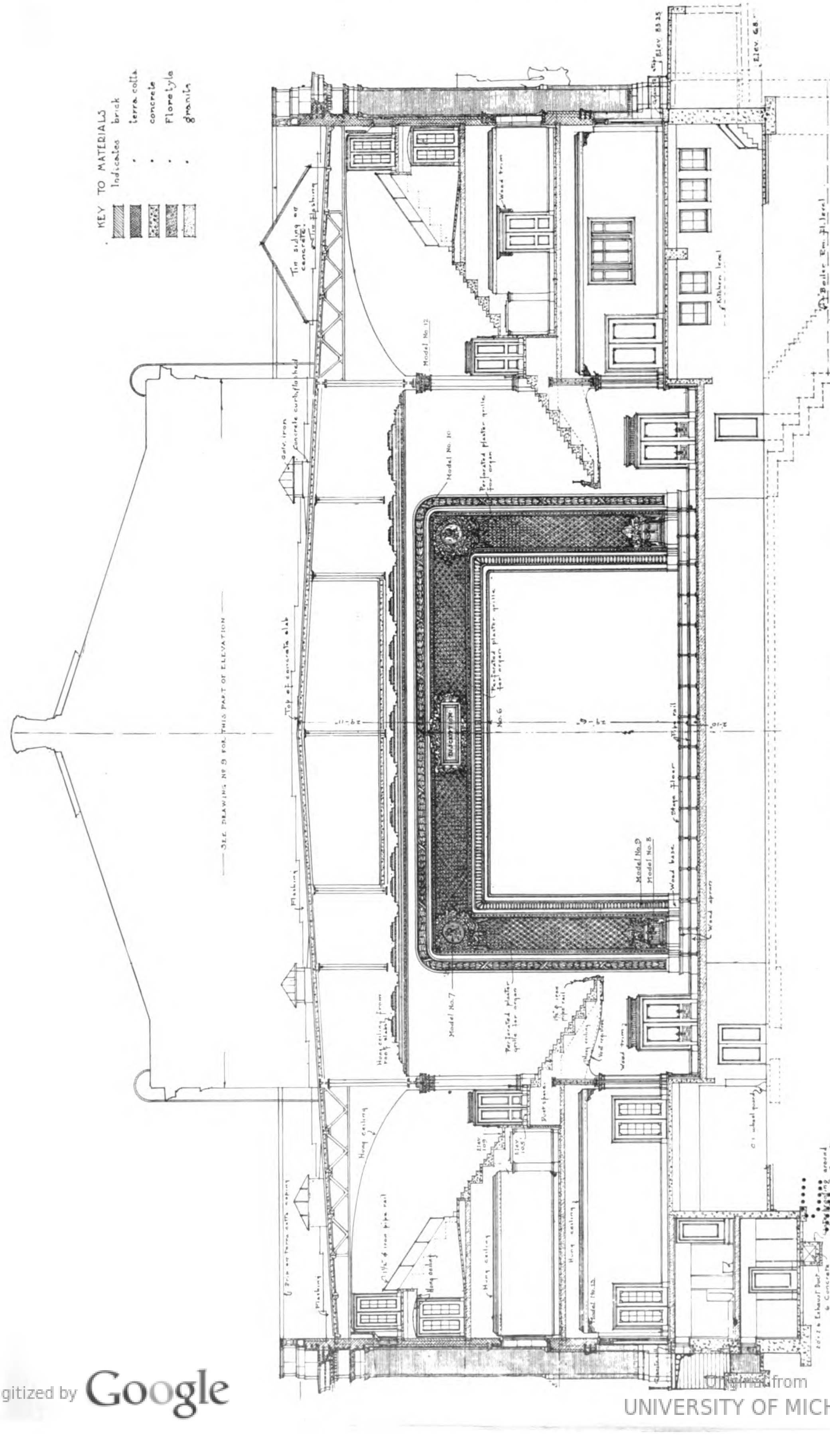
J. H. FREEDLANDER, A. D. SEYMOUR, JR., ASSOCIATE ARCHITECTS



SECOND FLOOR PLAN



FIRST FLOOR PLAN



TRANSVERSE SECTION

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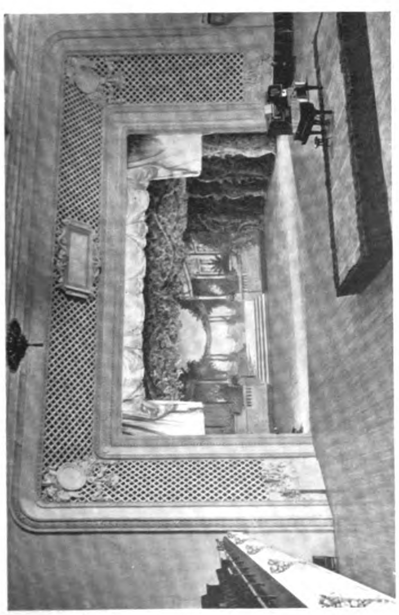
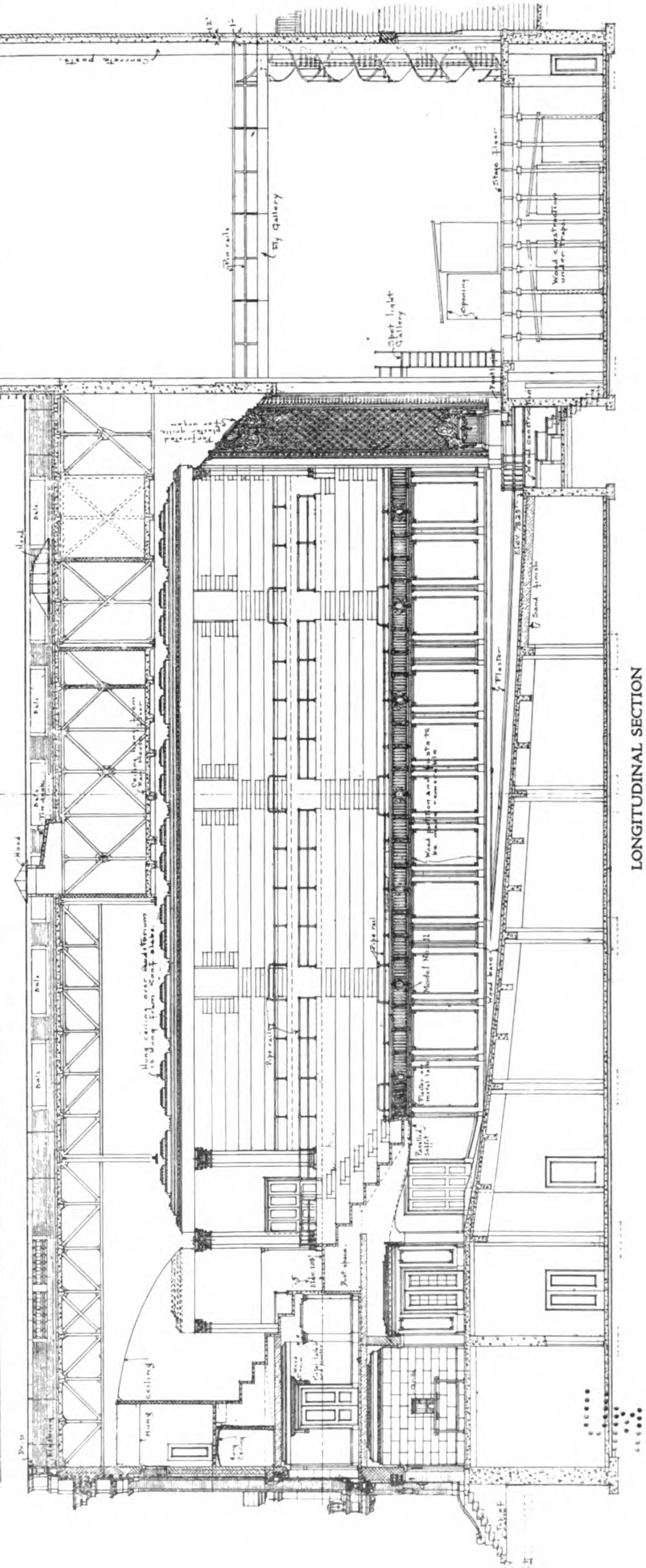


INTERIOR ARRANGED FOR EXHIBITIONS



LONGITUDINAL SECTION

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PROSCENIUM FROM THE AUDITORIUM

BALCONY AND PARQUET FROM THE STAGE

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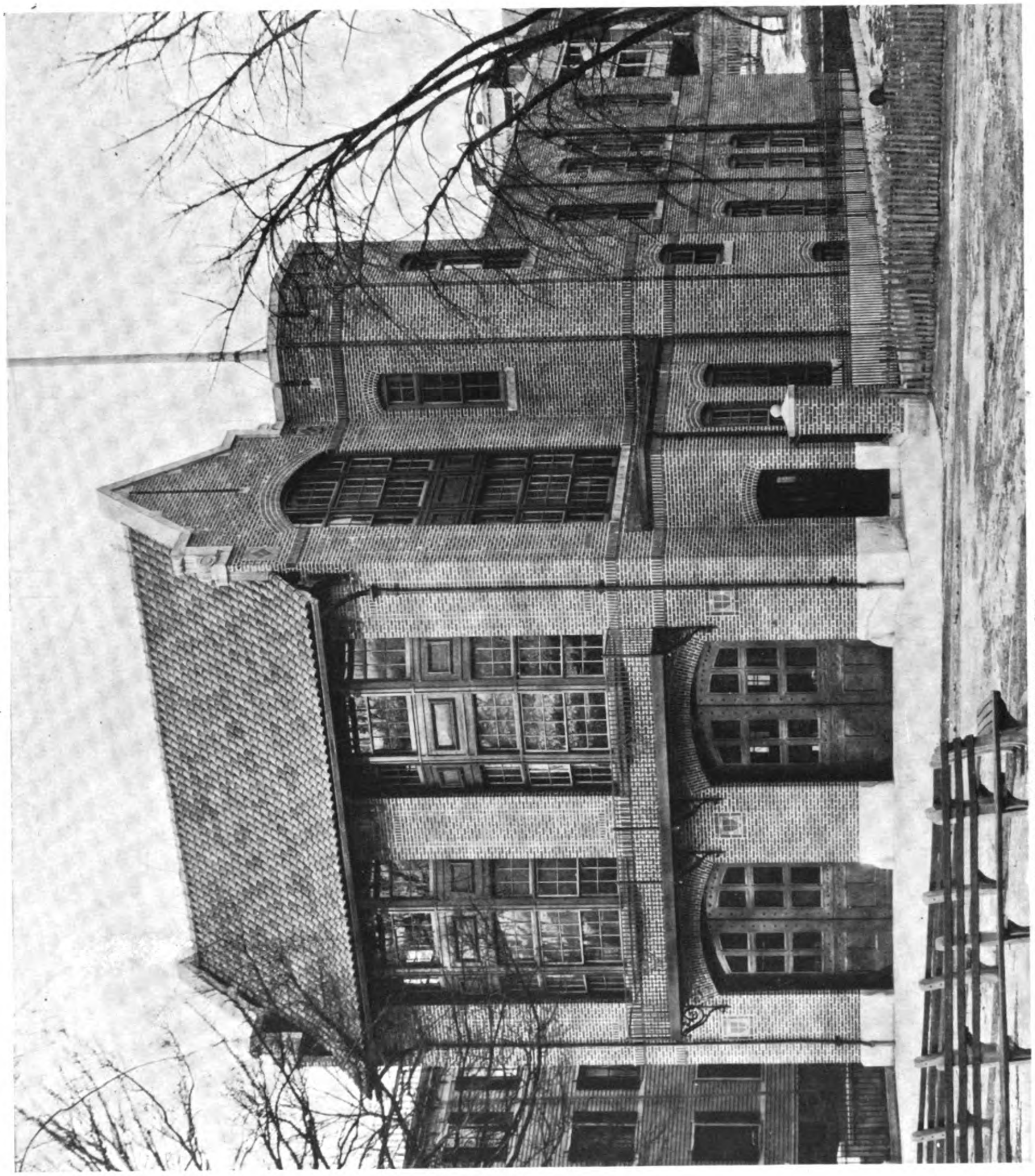
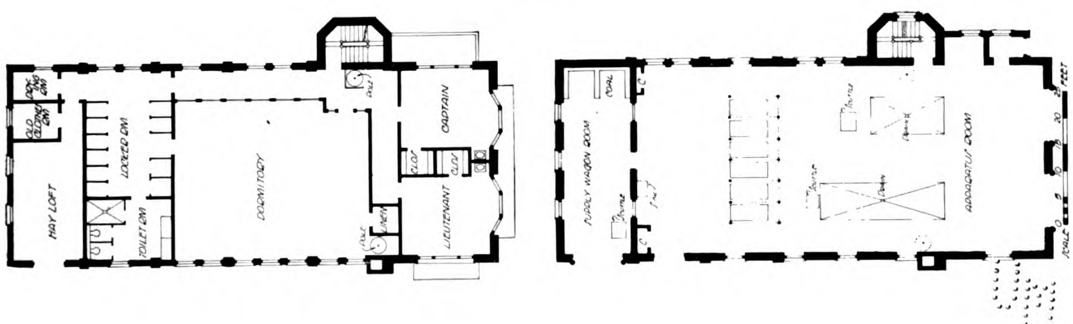
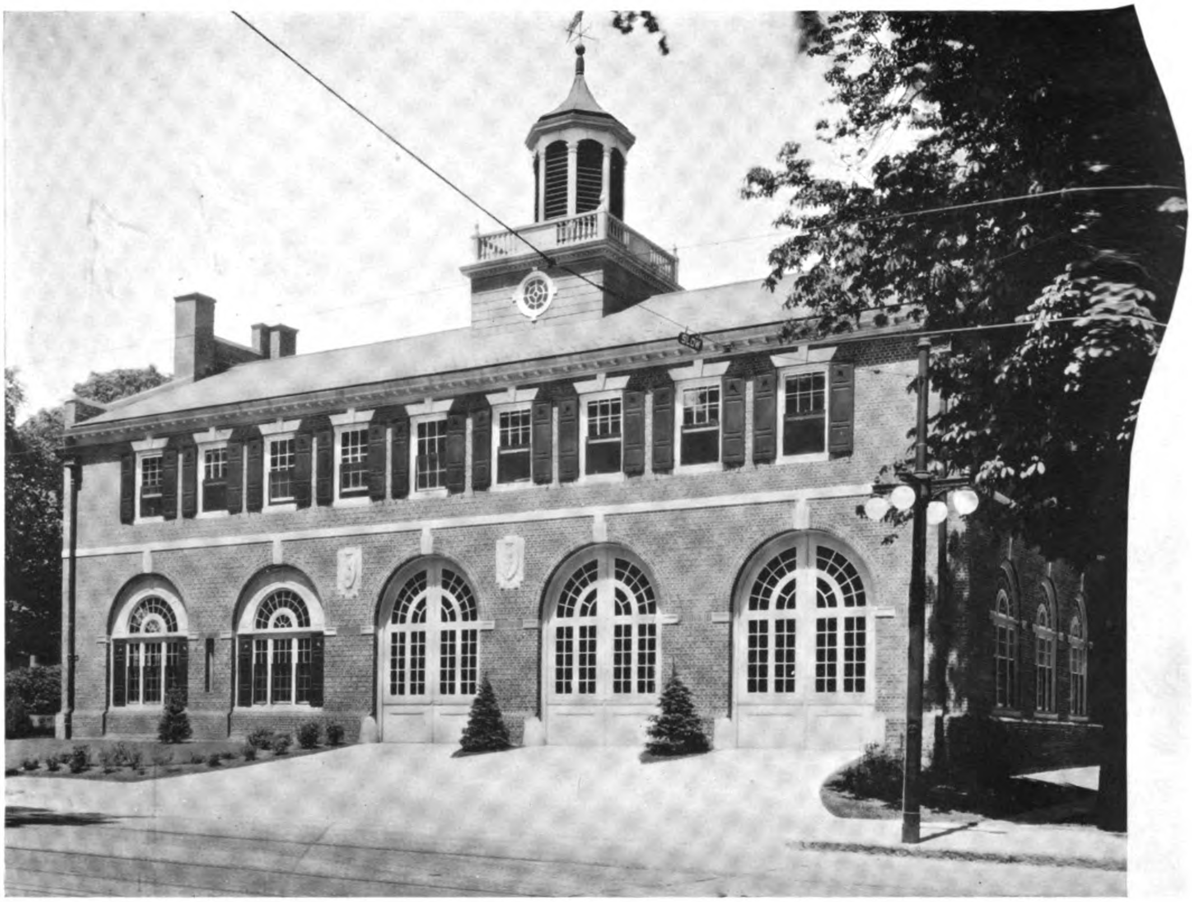




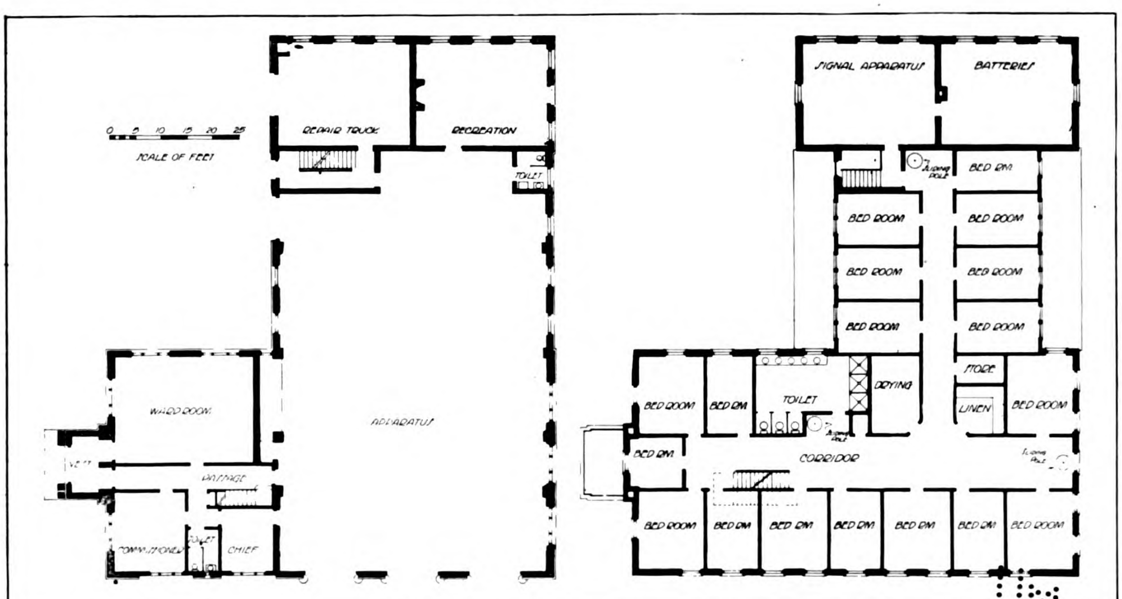
FLOOR PLANS AND MAIN FACADE

FIRE STATION FOR THE CITY OF BOSTON, BRIGHTON, MASS

MAGINNIS & WALSH, ARCHITECTS



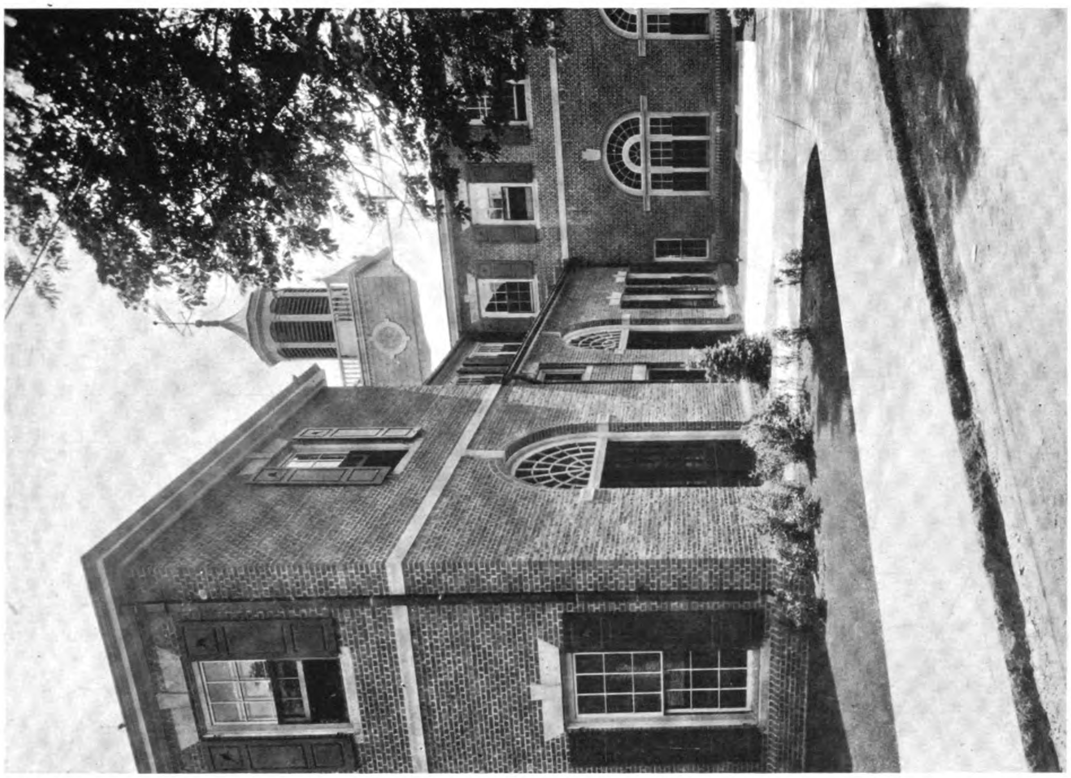
GENERAL VIEW

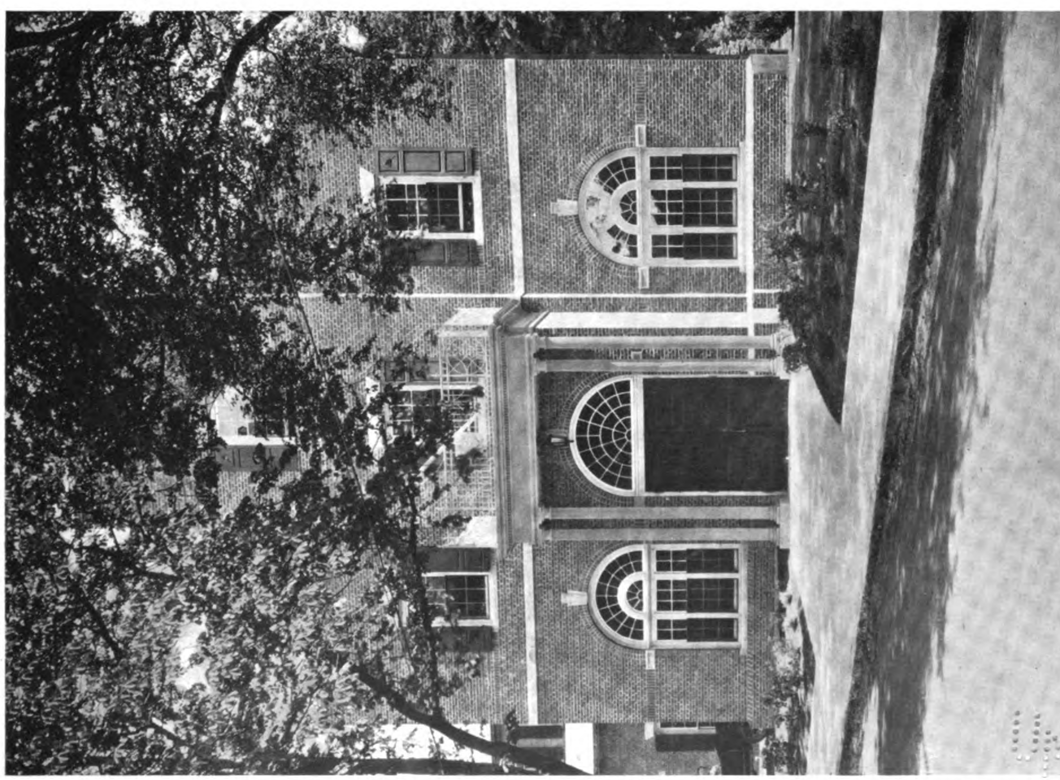


FIRST AND SECOND FLOOR PLANS

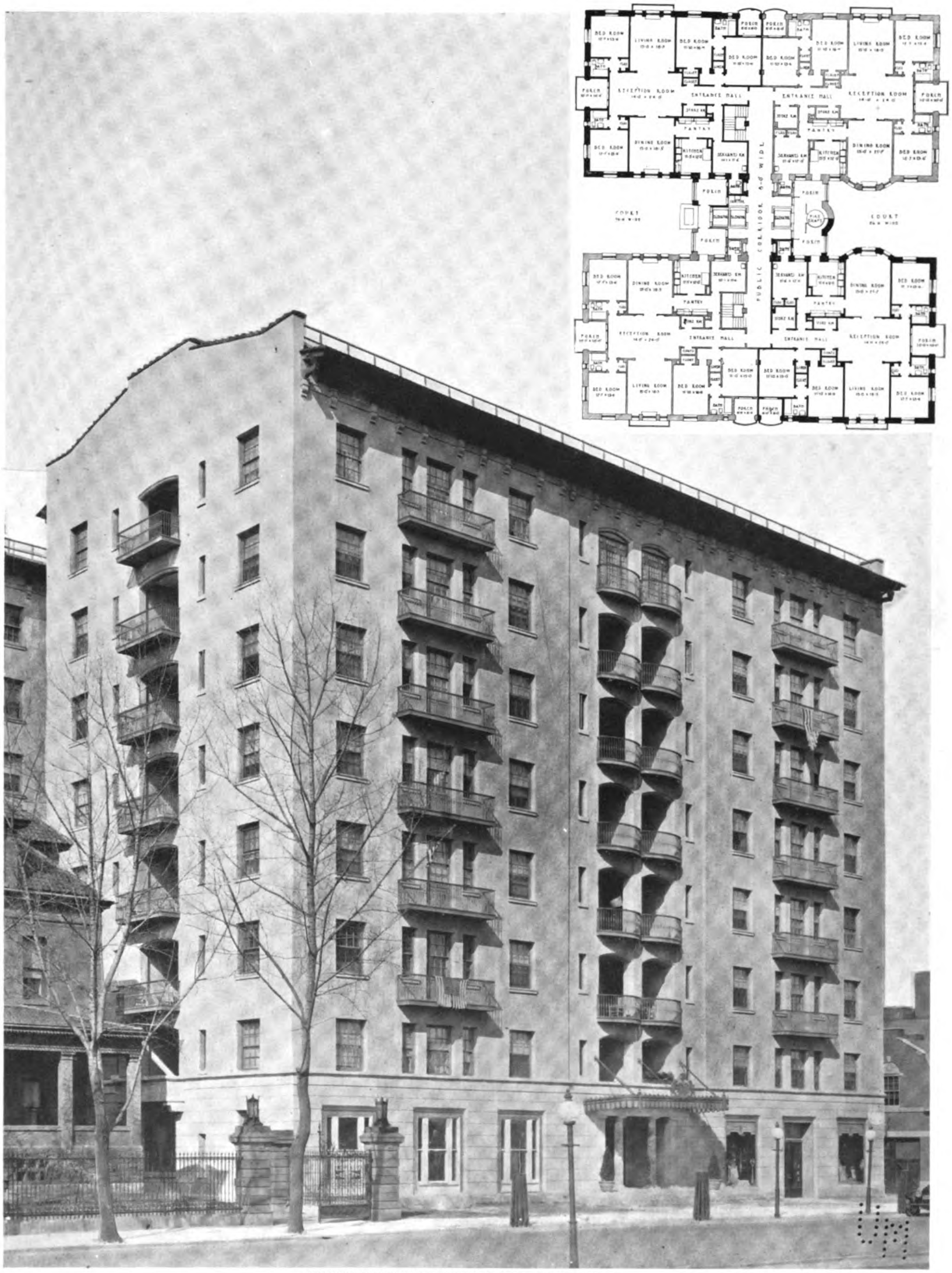
CENTRAL FIRE STATION, MALDEN, MASS.

CHARLES R. GRECO, ARCHITECT





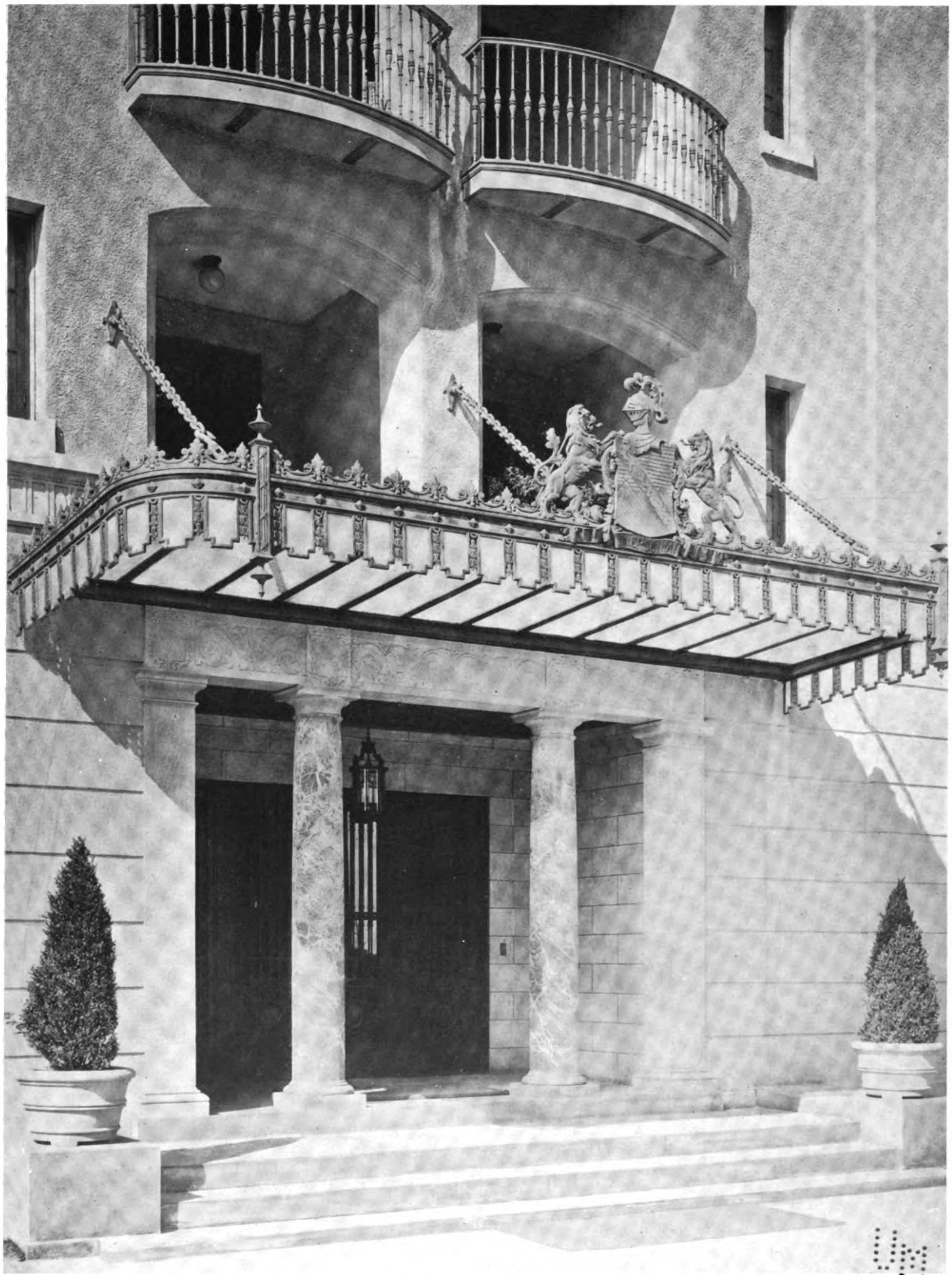
DETAILS OF REAR AND END
CENTRAL FIRE STATION, MALDEN, MASS.
CHARLES R. GRECO, ARCHITECT



GENERAL VIEW AND TYPICAL FLOOR PLAN

EMERSONIAN APARTMENTS, BALTIMORE, MD.

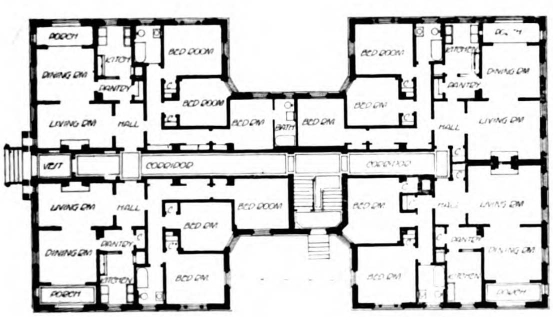
JOSEPH EVANS SPERRY, ARCHITECT



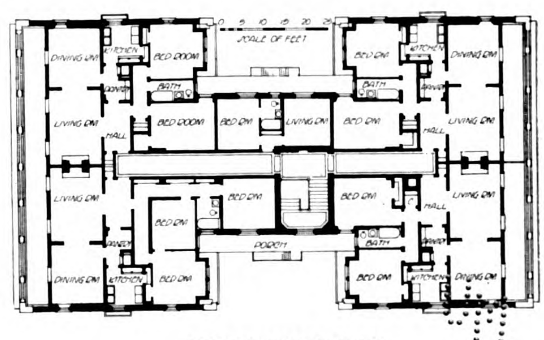
DETAIL OF ENTRANCE

EMERSONIAN APARTMENTS, BALTIMORE, MD.

JOSEPH EVANS SPERRY, ARCHITECT



FIRST FLOOR PLAN



FOURTH FLOOR PLAN

CARLTON APARTMENTS, BALTIMORE, MD.

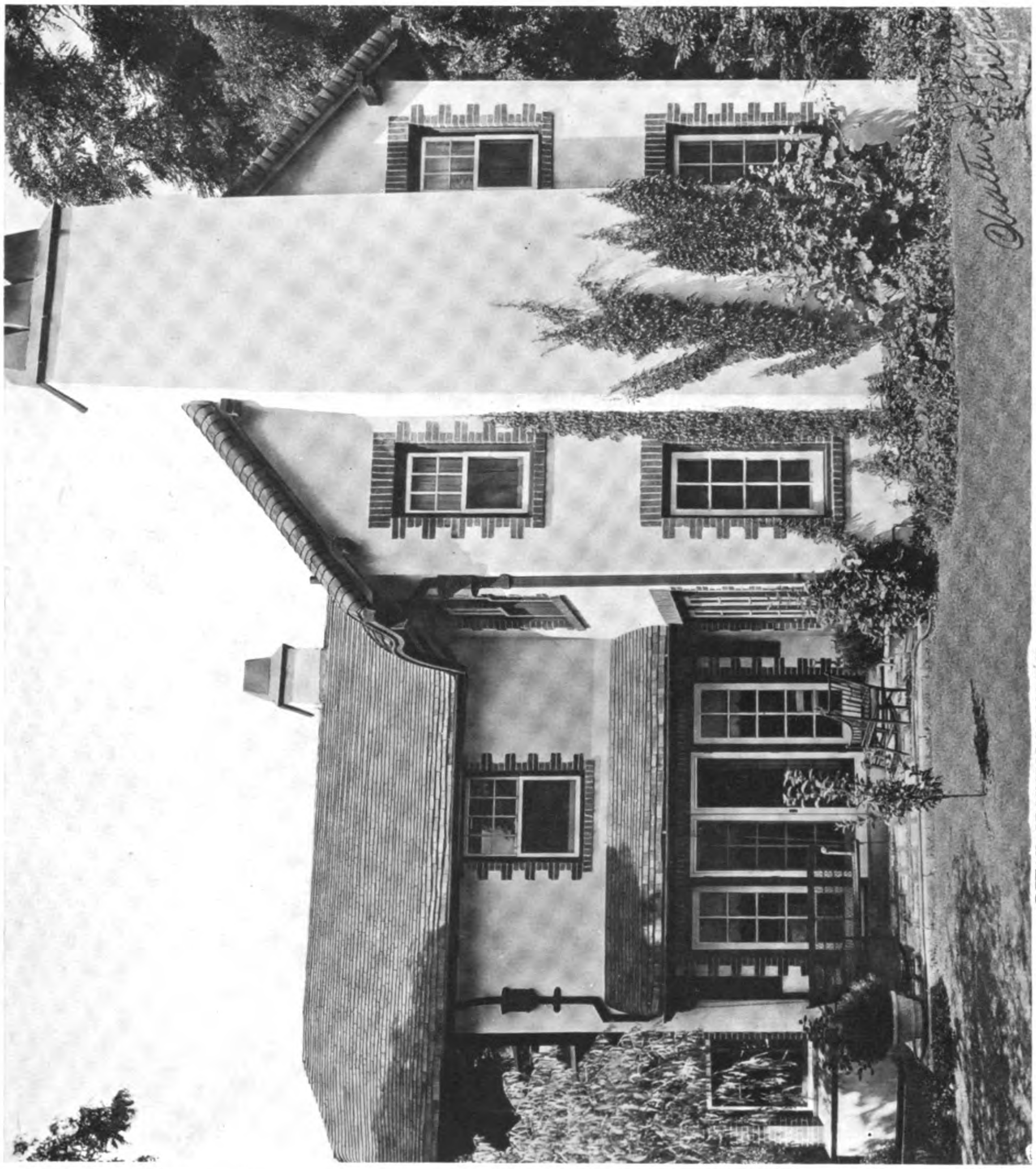
PARKER, THOMAS & RICE, ARCHITECTS

VIEW OF ENTRANCE FRONT

VIEW OF HOUSE AND GARAGE

HOUSE AT ROCKFORD, ILL.

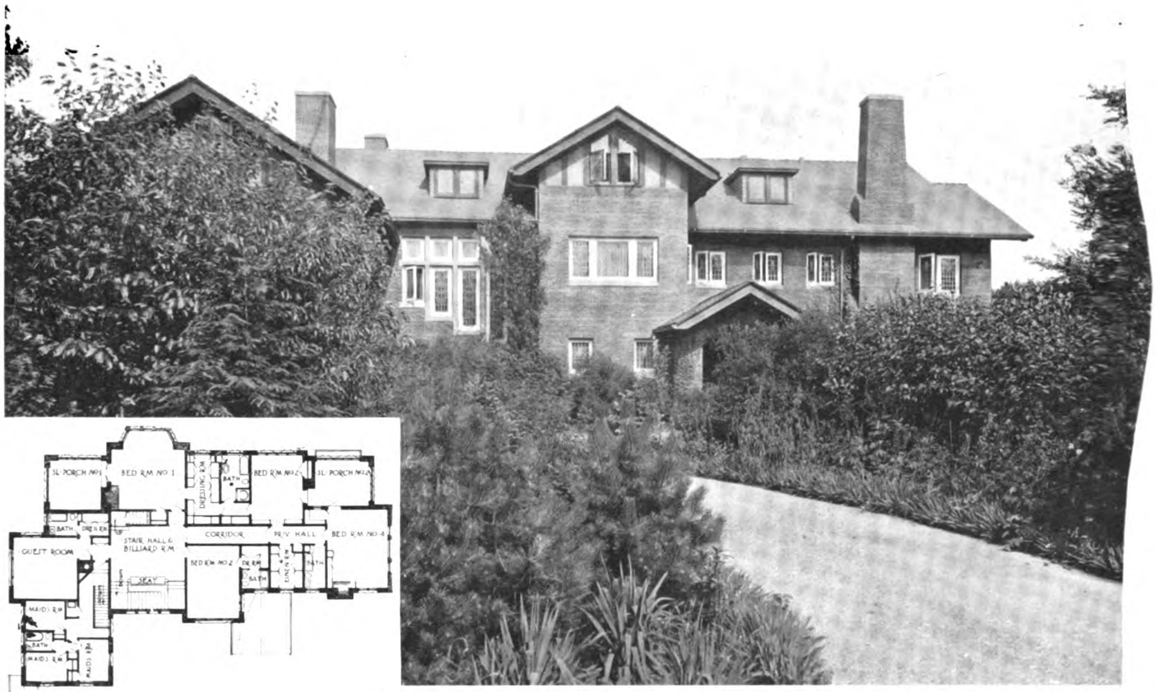
CHATTEN & HAMMOND, ARCHITECTS



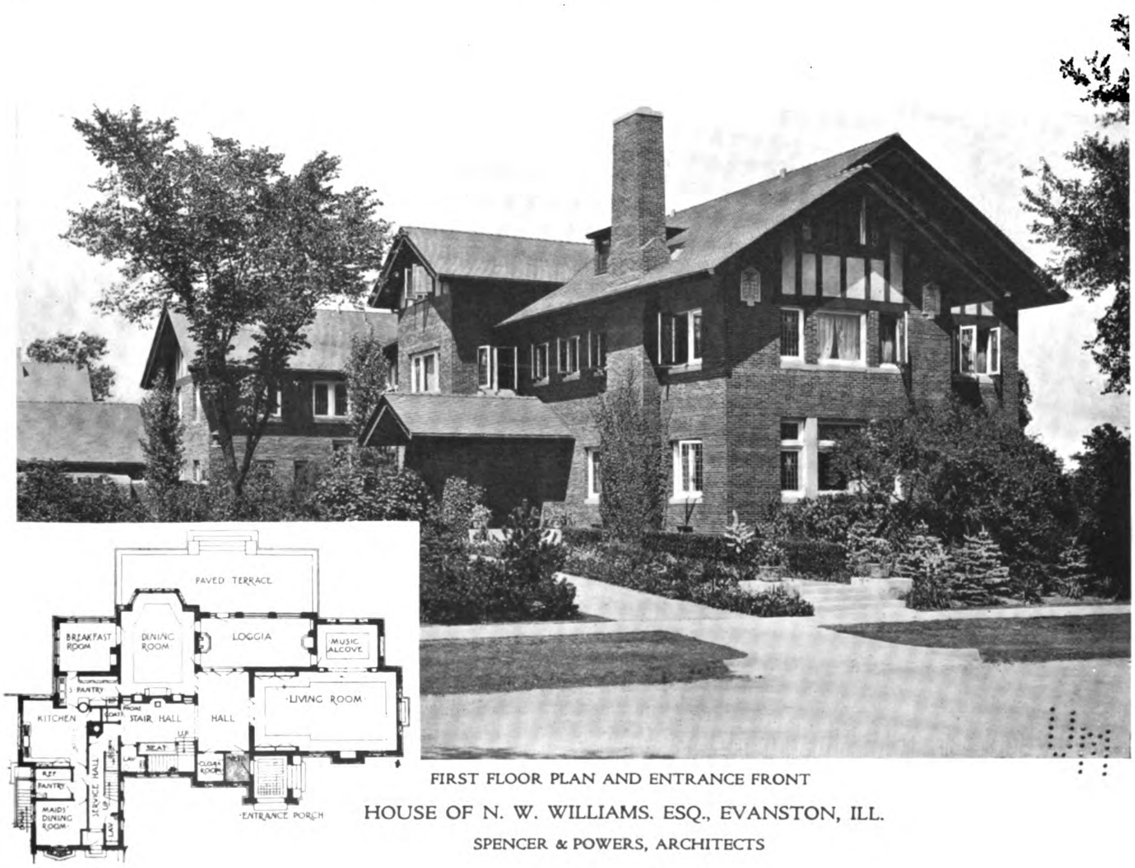
DETAIL OF LIVING ROOM END

HOUSE AT ROCKFORD, ILL.

CHATTEN & HAMMOND, ARCHITECTS



SECOND FLOOR PLAN AND VIEW FROM APPROACH

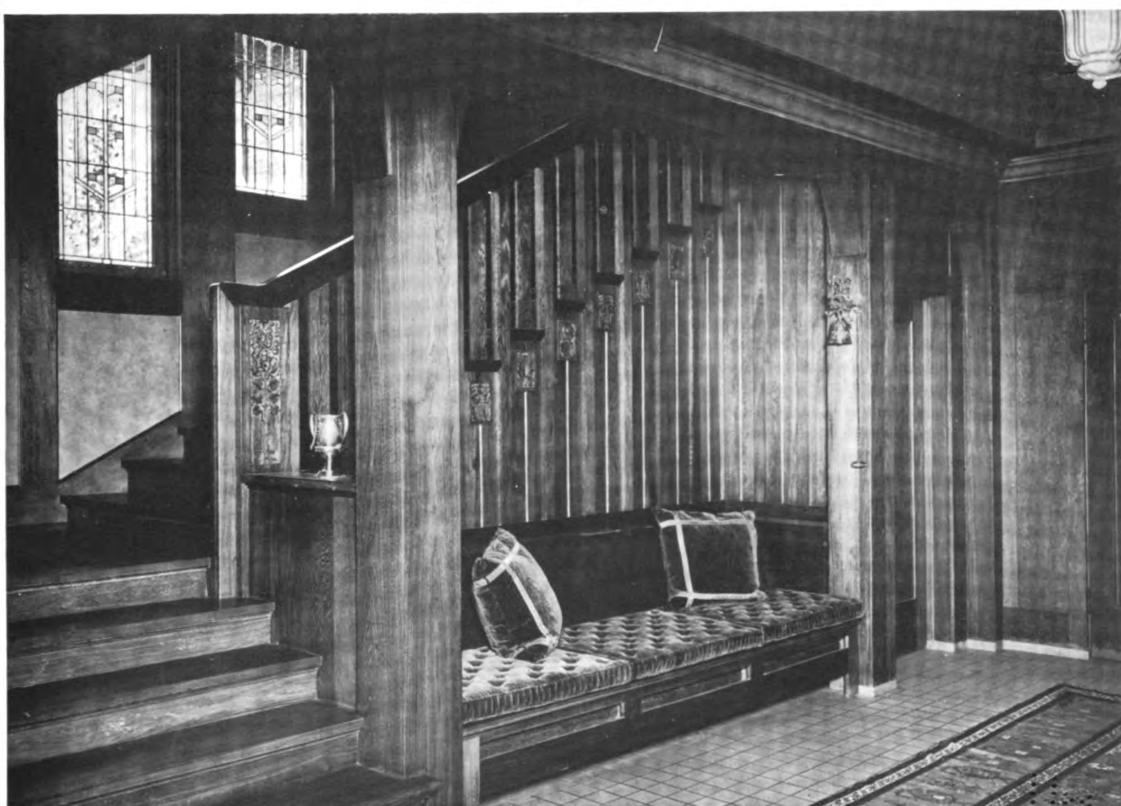


FIRST FLOOR PLAN AND ENTRANCE FRONT

HOUSE OF N. W. WILLIAMS. ESQ., EVANSTON, ILL.

SPENCER & POWERS, ARCHITECTS

VIEW OF GARDEN FRONT



STAIR HALL

HOUSE OF N. W. WILLIAMS, ESQ., EVANSTON, ILL.

SPENCER & POWERS, ARCHITECTS

THE ARCHITECTURAL FORUM

AUGUST 1920

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The
ARCHITECTURAL FORUM

VOLUME XXXIII | AUGUST 1920 | NUMBER 2

The Planning of Automobile Sales and Service Buildings

By F. A. FAIRBROTHER
Of the Office of Albert Kahn, Architect Detroit

THE planning of automobile sales and service buildings offers what might be called a changeable problem.

The history of the automobile industry from its early beginnings has been marked by great change and development. Unlike older industries, such as the making of cloth or farming implements, the automobile industry has had what seems to be a meteoric and spectacular growth and its constant development has been reflected in the changes necessary in the planning of buildings for use in connection with the ever growing business.

Naturally, in such a rapid development, processes and even principles have been made obsolete almost over night by the introduction of some new idea. This is well illustrated by citing the revolution in the process of assembling certain makes of cars which was put into effect in one large factory a few years ago. This was the change from assembling stations, to which materials were brought as the car was being put together, to the moving conveyor system whereby the car was assembled progressively as it moved along through the assembly building.

The widespread use of automobiles and the unceasing demand for service of all kinds in connection with them have made it necessary for manufacturers to provide stations in different parts of the country as distributing centers and also to serve as stations where cars could be taken care of and replacement parts provided.

It is our purpose to consider the requirements which usually affect the planning of sales and service buildings and to describe the considerations which have entered into the arrangement of the various structures illustrated. The different departments of the buildings will be described in detail and if the suggestions made seem to be too much in the manner of a text-book it should be remembered that they are intended to set forth a somewhat ideal condition. If, however, any suggestions which may be made are found to be of assistance to any one struggling with the problem of planning a sales and service building, we shall feel repaid.

Automobile sales and service buildings, as a distinctive type, have developed within the last seven or eight years. These buildings are distinctive in that they are a link in the process of making and marketing a product which has been developed on a large scale within two decades and, as seen in the automobile rows of our cities, are as easily recognized as power houses, apartment houses or churches. The developing of this type of building has been one of the marked examples of the improvement in the character of structures devoted to commercial uses and has progressed hand in hand with the vast improvement in the character of the buildings devoted to purely manufacturing purposes.

Garages we have had since we first commenced to drive cars, and stores where automobiles have been displayed have been seen along our Broadways and Michigan avenues since "horseless carriages" ceased to be curiosities and their manufacture was placed on a strong commercial basis.

The first places devoted to the sale and care of automobiles were naturally existing buildings, altered and adapted to the purposes of show rooms for cars and the necessary offices and garage spaces. But as the production of cars increased, and as the automobile became something more than the plaything of the well-to-do, the need for buildings designed especially for the display of cars and serving the needs of purchasers, in the making of repairs and adjustments, together with the attendant advantage of having these made by skilled workmen, became very apparent to the manufacturer. The modern sales and service building was the logical result.

The application of the word "service" to buildings devoted to the wants of automobile owners was doubtless the well chosen catch word of some advertising man, but it was a good word, well fitted to describe the uses of the building, and it surely is not the fault of its originator that we now speak of "service" as applied to almost everything from

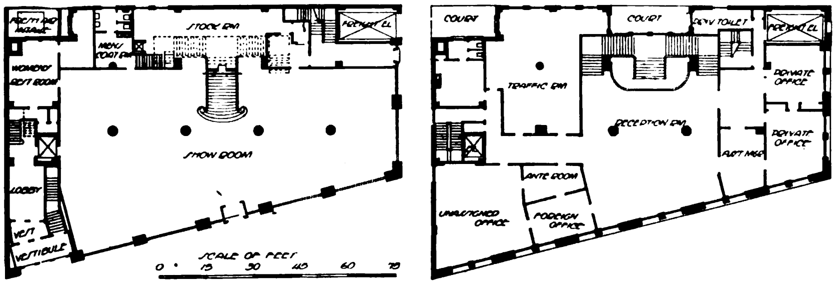


Fig. 1. Floor Plans, Sales Building for Ford Motor Company, New York
Albert Kahn, Architect

shining shoes to the altruistic work of the Red Cross.

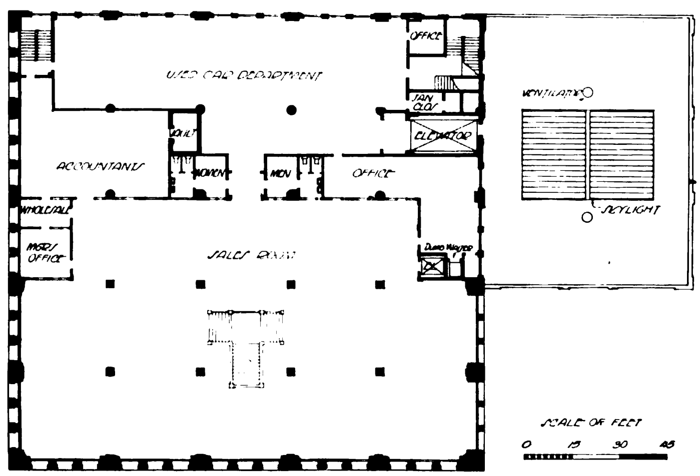
A few of the large automobile manufacturers are the direct owners of their sales and service buildings. Still other service buildings are controlled entirely by the local agents, and in one case, at least, the manufacturer, while not owning the buildings or having little, if any, financial interest in them, yet exercises, by virtue of contracts with his agents, a measure of control over the exterior design of the buildings and over some of the chief characteristics of their interior arrangements.

There is a very real value in having a chain of buildings scattered about the country all of which have a definite and unmistakable common character in design and arrangement so that any one who tours about from place to place may have a feeling of confidence and satisfaction when coming upon a familiar looking building where he can have his little wants attended to. Then, of course, the advertising value of such service buildings is great.

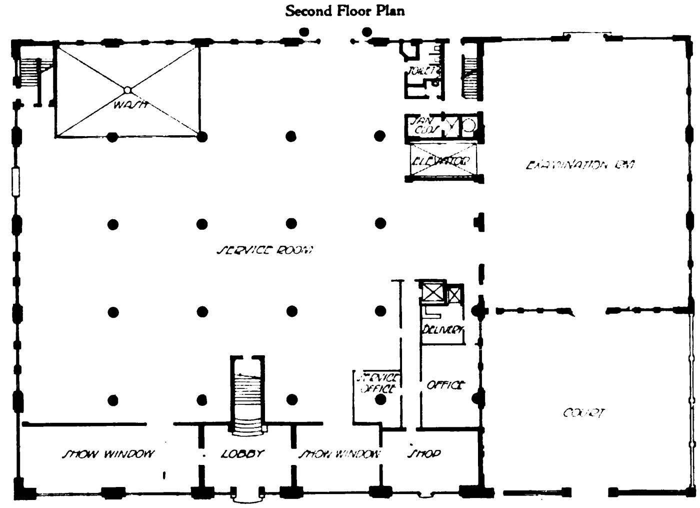
We find, upon analyzing the various kinds of sales and service buildings, that there are four chief classes into which they may be divided. First, we find the class of sales and service buildings where cars are assembled. These are often spoken of as assembly buildings and are usually larger than those where no arrangements for assembling cars are provided.

This type of building would naturally be situated in the center of a considerable territory and would serve as a distribution point to the smaller stations in that territory. It would serve as a distribution point for stock or replacement parts as well as for cars. Features such as sales rooms and headquarters for local sales forces would not constitute an important part of such a building.

The second class of sales and service buildings which we cite is that comprising the headquarters of a large district or state agent. Such a station will be found, in some cases, to serve more than one state and, on the other hand, in a thickly settled part of the country, or in a large state, might take care of only a portion of the territory in the state. In this type of building excellent show room space, also space for sales forces, is necessary. In common with the first class of stations mentioned, the bulk of the business done here will consist of the receiving of cars and parts and the reshipping or otherwise delivering them to subdealers and agents in other cities. Very little space for repair work or service, in the ordinary usage of the term, will be



Second Floor Plan



First Floor Plan

Fig. 2. Building for Cadillac Motor Car Company, Detroit
Albert Kahn, Architect

required. In this class of building considerable office space will be necessary to provide for taking care of visiting sub-agents and others from out of town.

The third class which suggests itself is the metropolitan or central sales and service station, probably being also the main office or headquarters for a large city territory. A building of this class will require admirable show room facilities as well as large office space, although it is quite likely, on account of the fact that such a building will be located on comparatively expensive property, that the service features may be lacking or at least of minor importance. If a building of this class is located in a sea coast city such as New York, it may, if it is the property of the manufacturer, house some at least of the foreign departments of the company.

The fourth and last class which will come under the heading of sales and service buildings is the local sub-agent's quarters or the small branch establishment of some larger dealer. This kind of a station will have show rooms, some office space and probably a large floor area devoted to garage and service departments. The small building of this class is the place where the greater part of the repair and other trouble work is taken care of.

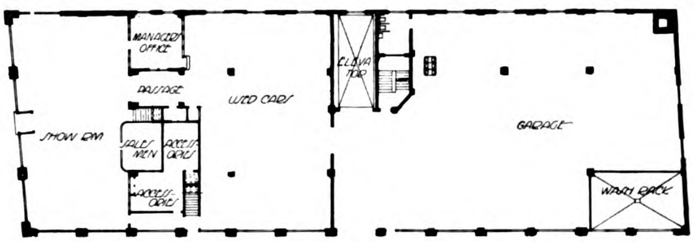
Other kinds of service buildings are common, such as those taking care of batteries or supplying gasolene and also service stations for taking care of tires, but these buildings are not automobile sales buildings nor are they automobile service buildings, although many automobile service buildings have departments devoted to the care of batteries and tires.

In the case of the larger buildings, especially those where cars are assembled, or where large quantities of stock or replacement parts are handled, a railroad siding is an important requirement. On the other hand, for a building serving more as a retail sales center or perhaps located in a city not too far from the factory or for a manufacturer with a separate receiving warehouse, the railroad siding is not important and such a building will, in all probability, be found on one of the main automobile thoroughfares and on more valuable land. The smaller branch or local service stations, of course, do not require railroad sidings.

Corner properties are, naturally, the most desirable, as they offer much better means of access to the service portions of the buildings and as the show room spaces may be arranged with less interruption by driveways and doors. Increased window space for display purposes also makes a corner location particularly desirable.

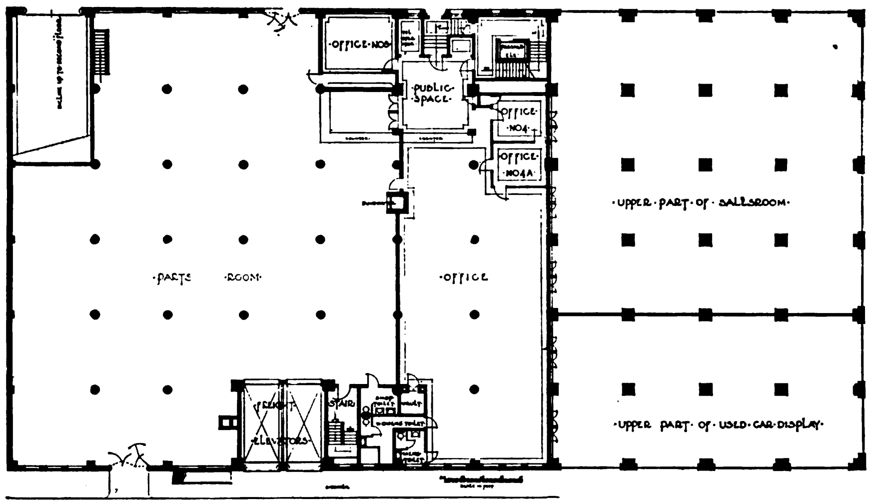
The building of the first chain of sales and service buildings devoted to the marketing and care of automobiles was commenced in 1912 by the Ford Motor Company. These buildings may be said to have paved the way for the similar buildings scattered over the country from coast to coast. The structures built by this company differed largely from the majority of the buildings erected since in that most of them were arranged for the assembling of cars as well as for display and service. The special features of the assembly of cars will be taken up separately in a later portion of this article.

As the ultimate object of all the processes of manufacture is the selling of the product manufactured, the part of the building devoted to the

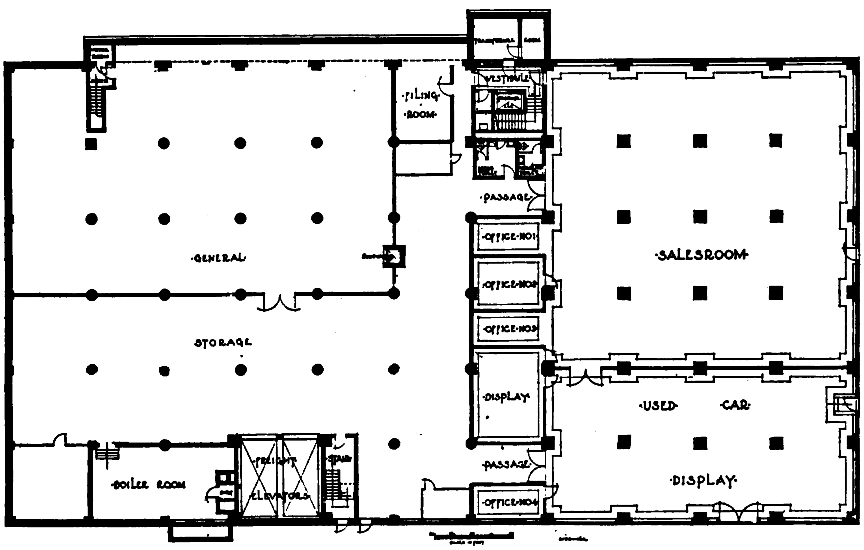


Main Floor Plan

Fig. 3. Building for Packard Motor Car Company, Hartford
Albert Kahn, Architect



Magazine Floor Plan



First Floor Plan

Fig. 4. Building for Willys-Overland Company, San Francisco

allow a mezzanine floor to be inserted back of the sales room where offices for the sales department, rooms for purchasers or stock offices may be located.

The position of cars while being displayed will, of course, depend upon the ideas of the sales manager, but it is evident that the room should be so arranged, whenever possible, that windows will be sufficient in width to allow a car to stand reasonably close to them and for the whole car to be seen when one is standing directly in front of the building or when riding by in the street.

The sills of the windows should be low. It has been the custom in many sales rooms to arrange a trough below the sills to receive a line of light reflectors for night display of cars, but this method has been done away with in many recent cases and provision has been made for display lighting by means of spot lights or other suitable fixtures arranged at the sides

making of sales may be considered the most important and will be considered first.

The sales room or show room will be found to vary in size and appointments with every building. The considerations affecting its location and size will vary with the property to be developed. Consideration must be given to the type of car it is proposed to display as well as to the number of models requiring space on the floor. The best display can be made when the room is large and high. The automobile, being an outdoor vehicle, will not look its best when shown in a low or otherwise cramped room. The need for height in the sales room part of the building is a requirement which sometimes makes it desirable to adopt a story height for the entire main floor somewhat in excess of actual needs and this height may easily

of show windows or on the transom bars. Lights placed in this way are well adapted to display cars to advantage and are less liable to throw a strong light into the eyes of people who may be on the sales room floor. General illumination of the sales room is likewise important, but is less difficult to arrange than the special display lighting, for the essential features of the general illumination are not greatly different from those in any large room.

Certain features are essential in the arrangement of a satisfactory sales room. Among them we might mention the need of a large door from the garage or service portion of the building for bringing cars into the sales room. This door will also provide means of communication for customers going to or coming from the garage. Access should also be planned to the parts and accessories sales departments from the sales room. An attractive display case for accessories will always be desirable.

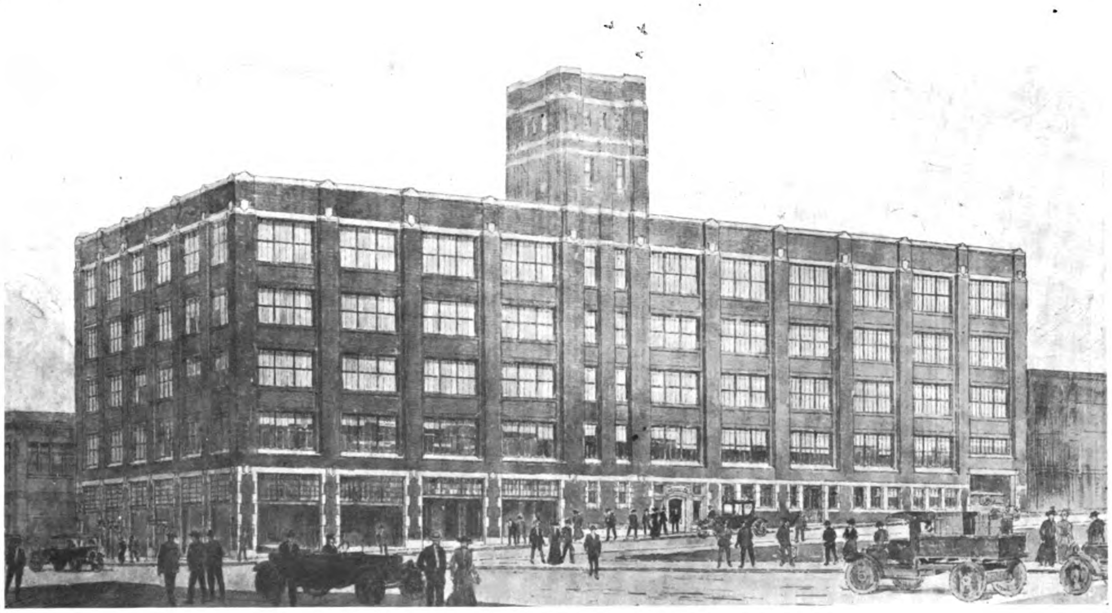
Here also should be arranged a space for salesmen's desks as well as some central position for an information desk. In some cases the best position for a salesmen's space is in a recess or other somewhat retired place where they may look up prospects and use the telephone freely. In such cases it might be found convenient to provide some sort of a private office off the sales room to which a salesman can withdraw with his prospect and where the process of signing on the dotted line may be carried out in quiet. If there are only one or two salesmen's desks on the floor, the private office may not be required. The information desk may also be the position of the telephone operator and a place where advertising folders, catalogs and other literature may be kept for distribution. It will be found desirable to have a customers' room and perhaps a retiring room for women in some convenient location adjacent to the sales room.

The sales room illustrated in the plan of the Ford Motor Company's building in New York, Fig. No. 1, presents an attractive arrangement where the cars are all displayed on one floor and where sufficient space is provided for a number of cars without crowding.

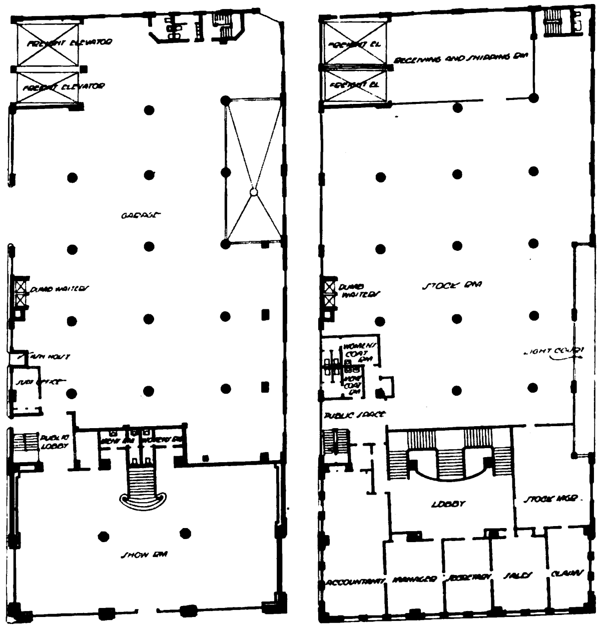
The arrangement for the display of cars provided in the plan of the sales and service building of the Cadillac Motor Car Company's building in Detroit, Fig. No. 2, differs considerably from the example just mentioned in that the show space for cars intended to be seen from the street is arranged in separate show windows sufficient in depth for one car only, while the larger display room is located on the second floor. This arrangement saves considerable ground floor space for service uses which would otherwise be taken up with the customers, first floor sales room and office spaces.

The sales room devoted to the display of used cars is, of course, less important than the room for display of new cars. Some such room is desirable, however, and in some cases is absolutely necessary. The used car problem confronts nearly all dealers and is dealt with in various ways. In some cases the show rooms are placed on the ground floor, perhaps back of the new car salesroom, and in other cases it will be placed in the second story. In the case of the Packard Motor Car Company's building in Hartford, Fig. No. 3, the used car sales room is located back of the main sales room and faces a side street, affording display windows which are good but less desirable than those on the front. The room itself is finished somewhat more simply than the sales room for new cars. The Willys-Overland Company's building in San Francisco, Fig. No. 4, shows an example of a used car display room occupying a corner room of nearly equal importance with the new car sales room.

A special place in almost every sales and service station will be required for the sale of parts and accessories. This department must be accessible to the public and should be so placed as to be easily reached both from the sales room and from the



Sales and Service Building for Willys-Overland Company, San Francisco
Mills, Rhines, Bellman & Nordhoff, Architects



First and Second Floor Plans

Fig. 5. Building for C. C. Coddington, Charlotte, N. C.
Albert Kahn, Architect

garage and repair parts of the building. It should also be provided with convenient access from outside the building, making it possible for customers to reach it without having to pass through the sales room. It is usually found desirable, where things can be comfortably arranged, to have a public space, with a counter, opening into the stock room, and also a cashier's office or cage adjacent to the public space and connected with the accounting offices. An arrangement which would embody such features would, unless the ground floor area were very large, suggest the placing of the parts sales department on the second floor of the building. This has usually worked out well and is not too remote for customers to reach.

The arrangement shown in the plan of the building for the Willys-Overland Company in San Francisco, Fig. No. 4, works out very well, as advantage is taken of the natural rise of the ground to locate the parts department above the level of the sales room and yet reached from the side street by a very few steps.

In the building for Mr. C. C. Coddington, in Charlotte, N. C., Fig. No. 5, the parts sales department is located on the second floor and the public space is placed near the general offices. This works out well here as the stock office, adjacent to the parts department, has convenient connection with the office lobby at the head of the main stairs. It is through this office that orders from local dealers throughout the territory are received and cared for.

A stock room, of course, is essential. It will be found to vary considerably in size. If the building is the headquarters, say, of a state agent or even the direct branch of the manufacturer and supplies the needs of various agents in smaller nearby towns, the stock room is apt to be very large.

It should be possible to close off the stock room from other parts of the building in order to make it more difficult to "lift" small and valuable parts which can be easily concealed and carried away. In some cases where the stock room occupies the whole or greater part of a floor and the elevator opens directly into it, it is desirable to have a separate receiving room where goods may be uncrated. Such an arrangement is shown in Fig. No. 5.

The stock room should have convenient communication with the repair department and machine shops as it is necessary for these departments to get parts from stock in making adjustments and repairs. A dumb waiter is often used for this purpose and will make it possible, when located properly, to serve various departments on a number of floors.

The stock parts themselves are kept in various ways. Some rooms may be fitted up with a fine array of steel shelves or bins and again others may be arranged with plain wood shelves and boxes. The weight of materials in this room is apt to be such that it is wise to figure floors for a somewhat heavier load than some other parts of the building, allowing perhaps two hundred pounds live load per square foot.

Further requirements affecting the planning of sales and service stations will be described in a succeeding number of THE ARCHITECTURAL FORUM.

"Lugger's Hill," Broadway in Worcestershire

ANDREW N. PRENTICE, ARCHITECT

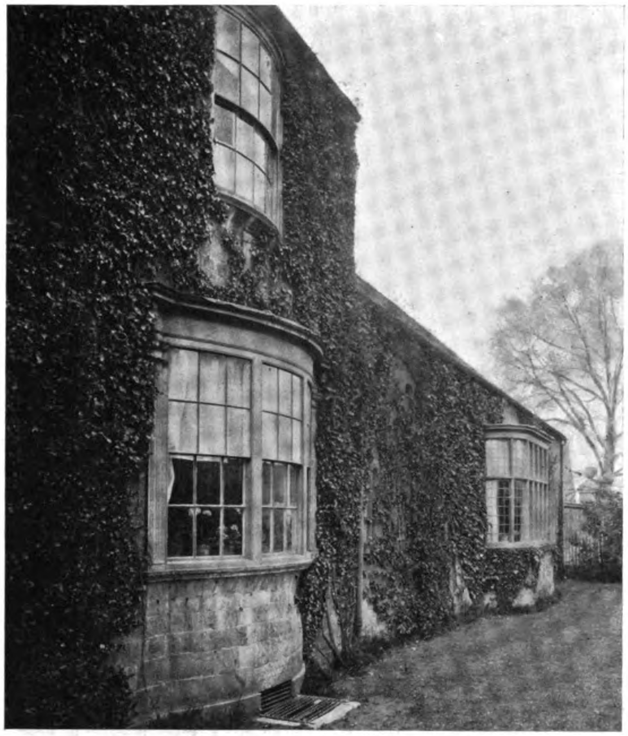
By HAROLD DONALDSON EBERLEIN

Garden Tea House

AT Broadway, in Worcestershire, is a very modern expression of the Cotswold architectural tradition which is significant to the student of domestic architecture, partly because of its intrinsic qualities as an individual house, and still more because of the general exposition it affords us of a certain principle involved. That principle affects the whole question of the propriety of adherence to or departure from tradition, and the measure in which such adherence or departure may be either justifiable or desirable. Before entering upon a discussion of the principle, however, it is well to scan closely the physical properties of the fabric; the preparatory scrutiny will clear the way for deductions.

In its dominant characteristics "Lugger's Hill" conforms to Cotswold tradition, that is to say, in the particulars of (*1*) the materials employed, (*2*) the manner in which they are used, and (*3*) the general lines into which the composition has been cast. The walls are of the local tawny limestone, with occasional variations in color ranging from cream to dull orange and weathering to a warm gray. For the roof the customary Cotswold stone tiles, obtained from the neighboring quarries, were employed. The walls show a face of roughly hewn rectangular stones, of wide diversity in size and dimensions but so laid as to preserve the effect of more or less regular courses. Chimney stacks, lintels and corners are of carefully dressed ashlar work in the same stone, as are also coping slabs, the ball finials at the gable peaks, and columns wherever they occur. The elements of the whole mass agree with traditional Cotswold usage;

View of "Lugger's Hill" from the Approach



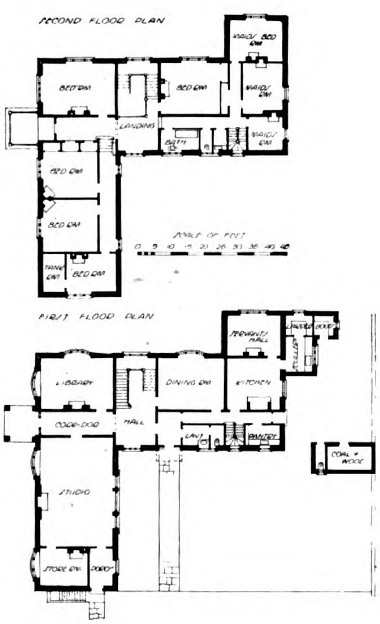
Window at "Russell House," Prototype for "Lugger's Hill"

—a combination of two or more long ridged and gabled units, joined together at right angles.

The house is unmistakably a Cotswold structure; even if quite removed from its surroundings and set down in the middle of Sahara, one could not err regarding its origin. But, notwithstanding this unequivocal assertion of Cotswold character, any examination closer than a mere glance will reveal particulars that serve to differentiate "Lugger's Hill" from what is popularly conceived to be the norm of Cotswold practice.

The scale is somewhat broader and larger than is customary in the older houses of the Cotswold district; the units are wider or deeper than the old Cotswold builders usually employed. This difference necessitates a much greater spread of the roof and is met by flattening out the pitch of the roof considerably more than is customary in the typical Cotswold house of earlier date. The fenestration is different, both in the matter of placement and in the treatment accorded the individual windows; on the east front the veranda sheltering the garden door, and the balcony above the veranda, are somewhat reminiscent of Georgian inspiration. All these items of departure from what is usually considered as the traditional Cotswold precedent are sufficient to account for a substantial difference of appearance from that of the ancient type. While permitting himself no small freedom of interpretation, and precluding any possible charge of blind following of precedent, the architect has nevertheless very happily contrived to preserve the essential Cotswold spirit.

Each and every divergence from strict traditional usage had a reason either in meeting some very practical and modern physical requirement or else in the expression of a justifiable preference. The larger scale and the greater width or depth of the several divisions of the structure are obviously made necessary by the dimensions and arrangement of the rooms to be provided for in the plan. As for the fenestration and the motifs

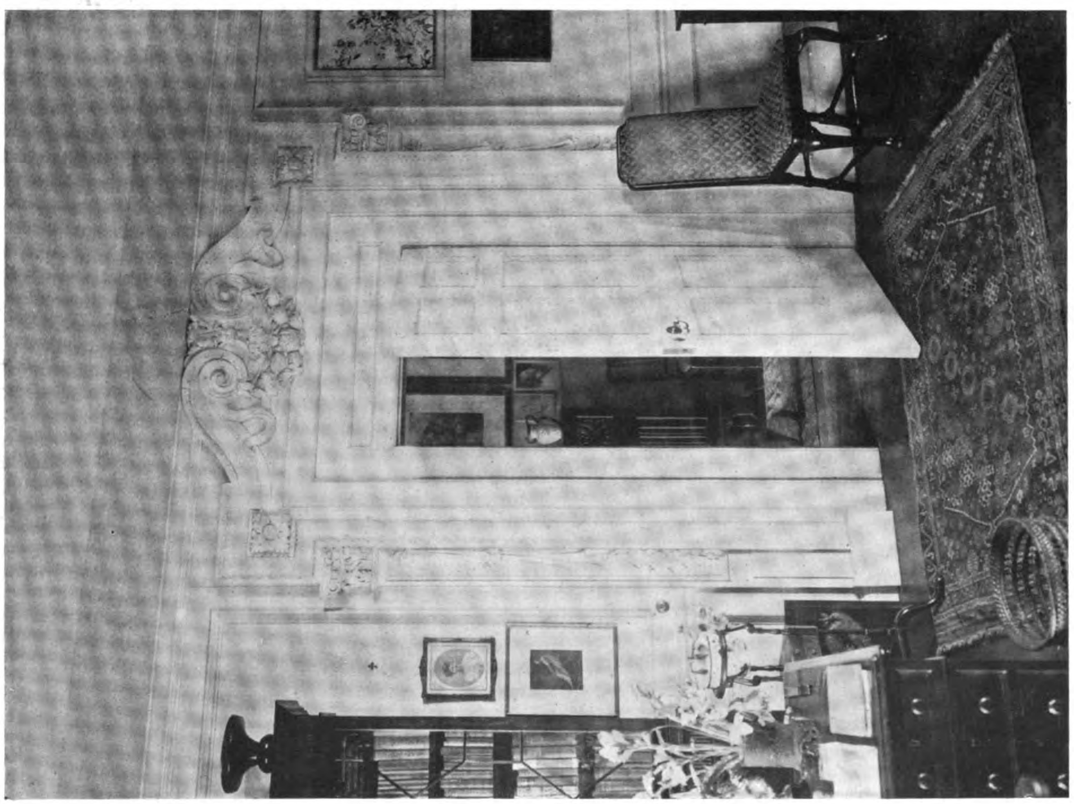


Façade Showing Use of Bow Windows at "Lugger's Hill"

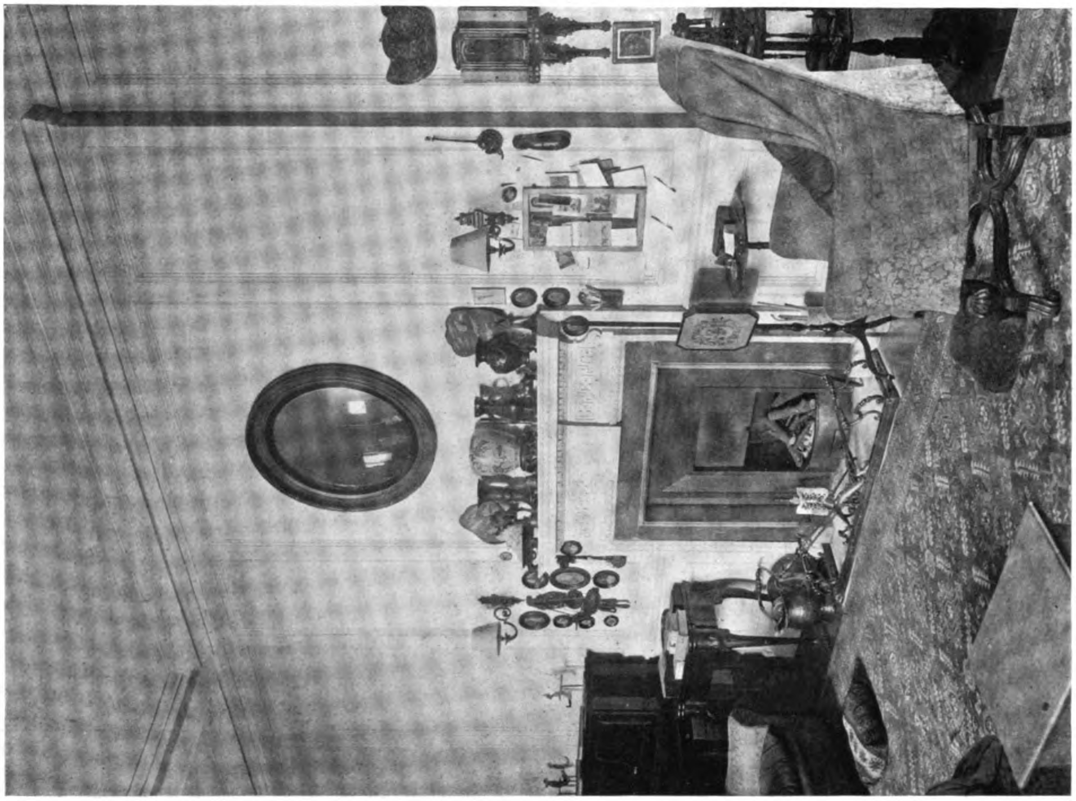
VIEW OF FORECOURT FAÇADES

VIEW FROM THE GARDEN, "LUGGER'S HILL," BROADWAY, WORCESTERSHIRE

ANDREW N. PRENTICE, ARCHITECT



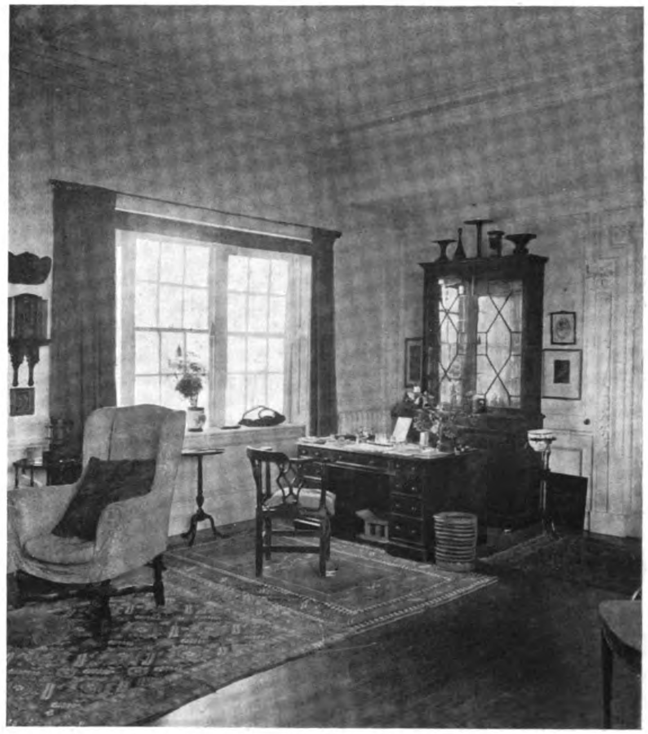
DOORWAY EXECUTED FOR INIGO JONES



DETAIL OF FIREPLACE IN STUDIO

"LUGGER'S HILL," BROADWAY, WORCESTERSHIRE. ANDREW N. PRENTICE, ARCHITECT adopted for windows, doors and verandas there is not so radical a divergence from local precedent as might at first be imagined;—a fact that will be more explicitly pointed out later on.

The interior treatment of "Lugger's Hill" is distinctly of the period of Queen Anne with certain later details;—early Georgian for the most part, while there is one doorway which is the work of Inigo Jones. This was taken from the master's former studio in London and incorporated in the new house. The detail of the woodwork everywhere else, and especially the carving of the fireplace in the library, will speak for itself. The paint in the library is a light green, in the dining room a darker green, and in the other rooms white.



A Corner of the Studio

"Cotswold architecture," be it noted, is a somewhat comprehensive term and needs, perhaps, some explanation for those not fully familiar with it on its own native hills and in all its phases. There is, to be sure, a general Cotswold type or style that possesses a singular unity and, at the same time, exhibits a peculiar detachment from all other regional manifestations so that it is not to be confounded with any of them. This style possesses a unity and a detachment determined by the characteristics of available building materials, by a unique combination of conditions, and by strongly pronounced habits and methods of craftsmanship that persisted with exceptional tenacity, notwithstanding the assimilation, from time to time, of influences from the outside world. And yet, within that unity are to be found such manifold diversities that the student of Cotswold architecture is rewarded with the delights of ever recurrent novelty. There is a Tudor phase, a Stuart phase, a Queen Anne, an early Georgian and a late Georgian phase, and each is distinct in its expression from kindred and contemporary phases elsewhere.

Bow Window in the Library

Broadway is an epitome of Cotswold architecture. Within the limits of the village one may find every one of the phases just mentioned, and one item in this visible record of the genesis of a tradition is "Russell House," which supplied the prototype for the fenestration of "Lugger's Hill." Late in the eighteenth century "Russell House" was converted from a Tudor hostelry into a private dwelling and the new owners, with the appreciative judgment so often displayed in that period, devised a window treatment that successfully expressed the current taste in a Cotswold medium without doing violence to the spirit of the existing building;—an ingenious grafting of a new shoot on the stock of mellow Cotswold tradition.

To have thrust into this village of homogeneous though diversified composition a new house of unrelated or exotic type would have been an affront. Even though the house in itself might have been of excellent design and might have afforded the architect a free and more alluring scope for the exercise of invention, the impropriety would have been none the less real. It would have introduced a jarring note into surroundings of complete harmony. The building of any new house in a place of Broadway's narrow limits carries with it a measure of architectural responsibility far greater than would be the case in a more extended community, for here each individual structure has a relatively greater prominence and an anachronism would have no chance of being hidden away.

There was one course, and only one, open to the architect:—to accept the local tradition and to make such adaptations or modifications as common sense and the manifest needs of the occasion indicated. In so doing he not only complied successfully with the physical requirements imposed by the task, but he also showed his faith in the value of a vital local tradition, very much alive because it has satisfied, and still satisfies, all the plainly evident demands of the situation, and has always been flexible enough to incorporate new elements of approved worth without impairing its own architectural integrity.

Detail of Entrance Front

Some Recent California Architecture

THE WORK OF LOUIS CHRISTIAN MULLGARDT, ARCHITECT

WHILE various architectural styles are identified in the popular mind with the early history of many of the older sections of the country, there is possibly no part of the United States to which any particular kind of building belongs in quite the same degree as that to which southern California and the surrounding district may lay claim to the Spanish styles. The circumstances surrounding the early use of Spanish methods of building suggest a page from mediæval history or a leaf from a forgotten romance. The earliest builders of structures which yet remain in this region were the early Franciscan missionaries,—at once discoverers, pioneers and soldiers of the cross,—who dotted the hillsides and valleys of southern California with their missions and monasteries. These old structures are built in the effectively simple Spanish style which has ever since seemed to belong, in a sense, to the region which was the scene of their apostolic labors.

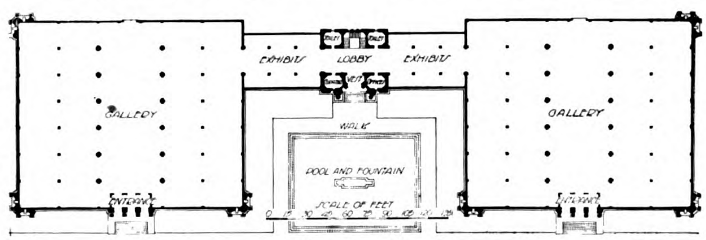
Of late years architects of the far West have turned in an ever increasing degree to the use of this form of architecture. Visitors to the Exposition at San Diego brought back marvelous tales of the glory of Spanish architecture as there exemplified.

The success of these exposition buildings established a precedent which has had a powerful influence in the determining of architectural styles in southern California and particularly in the case of large buildings of a public or semi-public character.

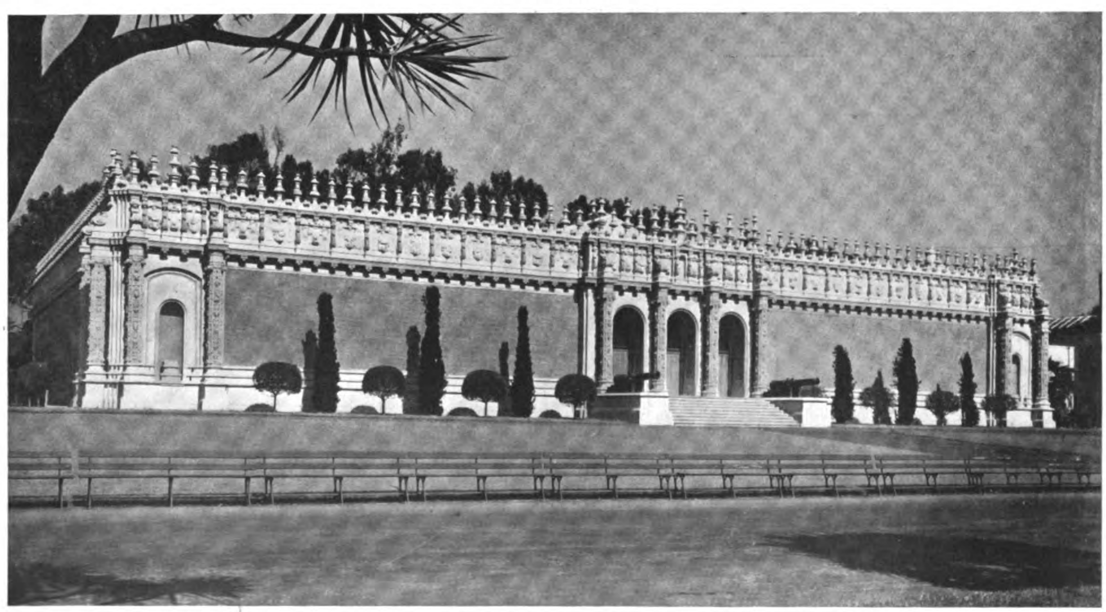
This style abounds in opportunity for the effective use of space; it affords adequate scope for the successful treatment of large areas of floors or ceilings or of broad expanses of wall, and the most successful results are often found to follow the skilful use of comparatively simple materials.

Two recent examples of the use of these Spanish traditions in building are the work of Mr. Louis Christian Mullgardt, architect, of San Francisco. The more important of the two buildings is the new structure for the Memorial Museum in Golden Gate Park, San Francisco, which came into being largely as a result of the keen interest taken by San Francisco's journalist, Mr. M. H. DeYoung, in the original museum, a relic of the Mid-Winter Fair of 1893. There existed a rare collection of valuable exhibits, the result largely of individual gifts, and the obvious necessity of a permanent museum building has resulted in the structure under discussion.

Like most of the world's great institutions the



Main Floor Plan

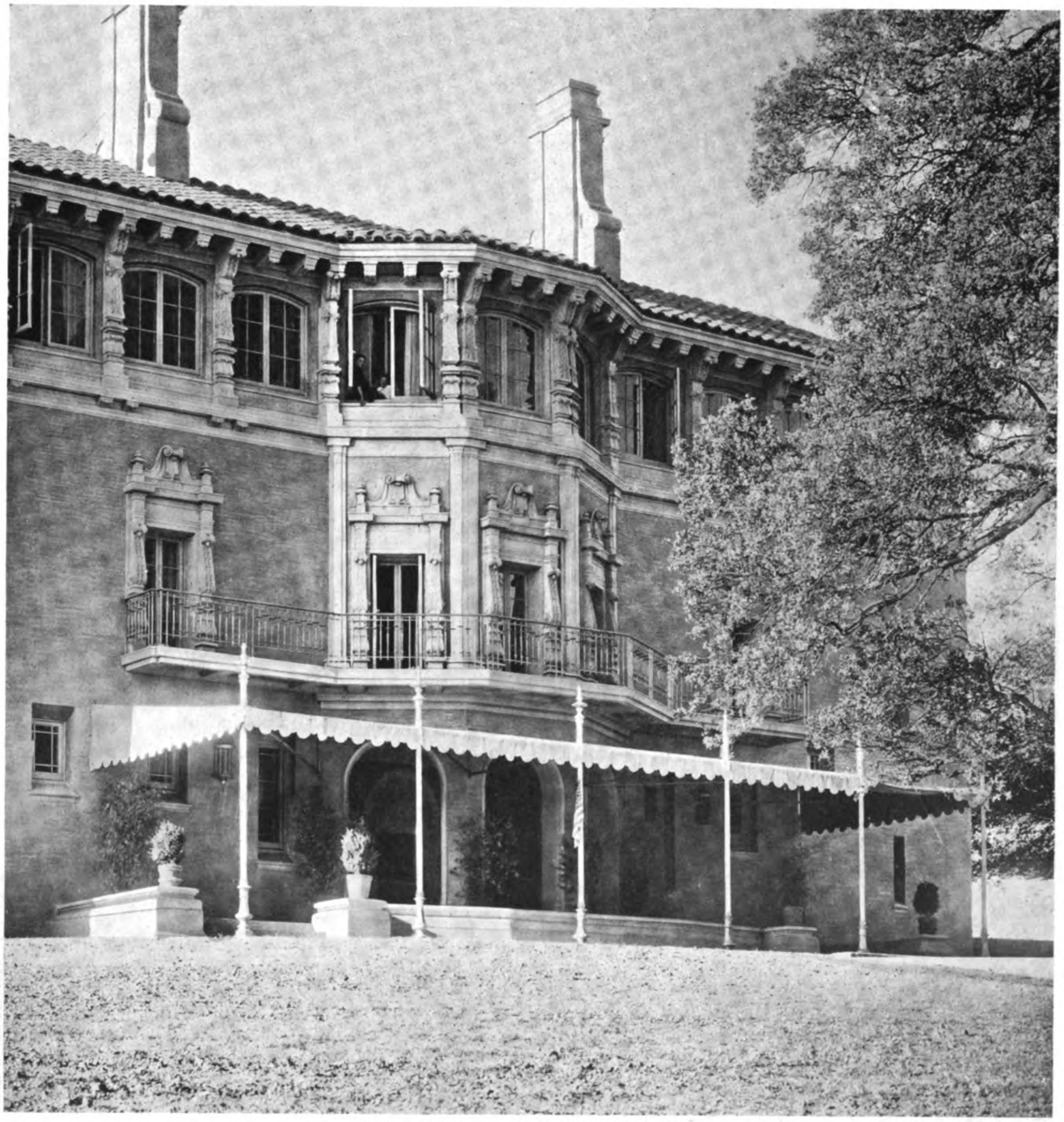


General View of Memorial Museum, Golden Gate Park, San Francisco

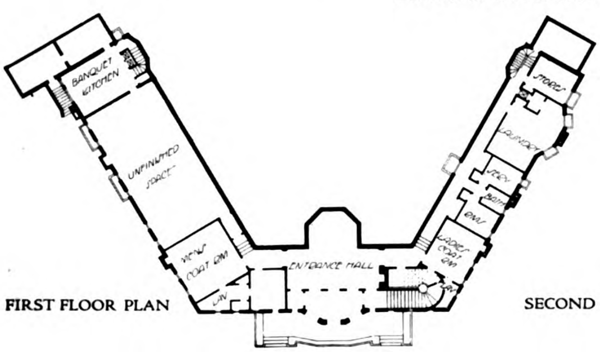
Memorial Museum is to be the result of gradual development and continuous growth. The architect has very wisely planned, therefore, for a building which may be developed gradually and yet which will at no stage of its development appear to be anything but a structure which is finished and complete. The museum, as it is shown in the accompanying pictures, is but one of the two parts which will form the completed building. Midway between the two pavilions, which will be connected by a smaller gallery, is to be a square tower, which will dominate the group and upon which will be lavished the wealth of ornament and symbolism which is already used upon the part of the museum which is already built. The structure is of reinforced concrete with hollow tile walls. Cement plaster of a texture which somewhat resembles Travertine marble is used for outside walls and the lavish ornament of the exterior is of cast stone. The tone quality of the building is a delicate buff pink which might be said to be in harmony with the colorful landscape of California.

Detai of Main Entrance Doorways

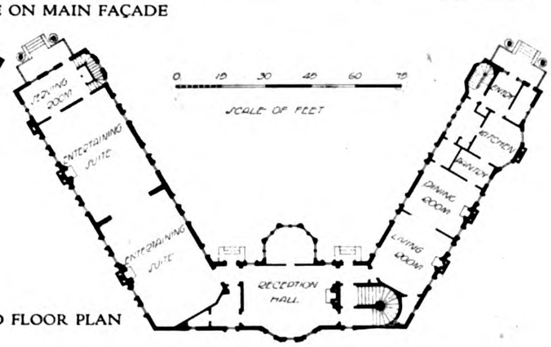
Memorial Museum, Golden Gate Park, San Francisco



DETAIL OF ENTRANCE ON MAIN FAÇADE



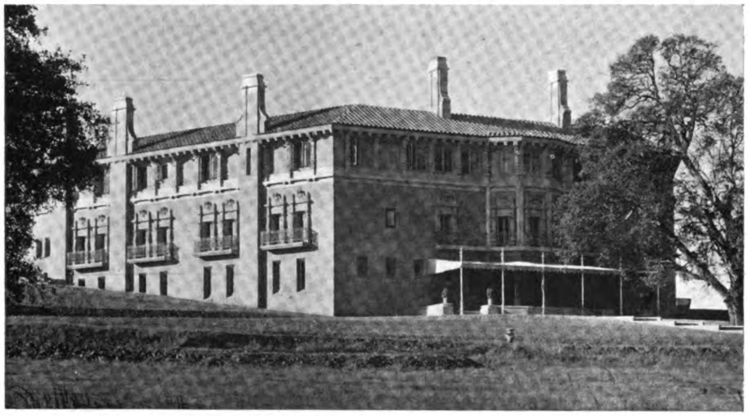
FIRST FLOOR PLAN



SECOND FLOOR PLAN

PRESIDENT'S HOUSE, LELAND STANFORD JUNIOR UNIVERSITY, PALO ALTO, CALIFORNIA

LOUIS CHRISTIAN MULLGARDT, ARCHITECT



View of Left Wing and Main Façade

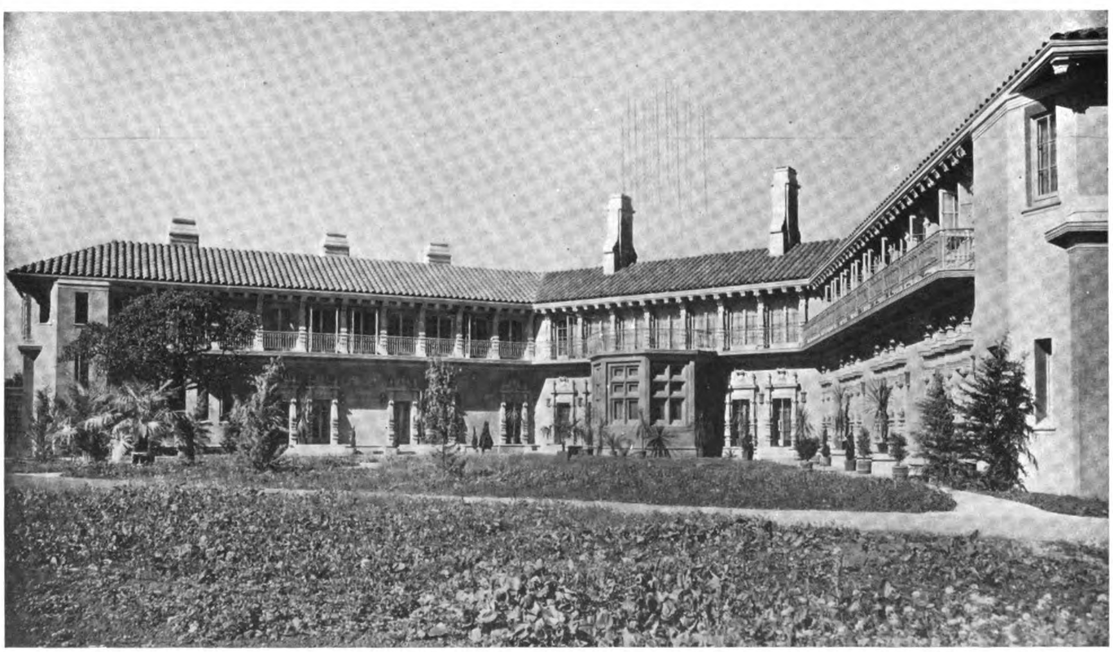
the early explorers and the Spanish friars, then the pioneers of '49 who came with pick and gun for gold but who stayed to build the basis of the commonwealth. All this sequence of symbolism leads up to its culminating architectural expression in a figure of Superior Intelligence, type of the justice and progress of the world. The upper part of the tower will have a chime of bells.

Of a somewhat different Spanish type is the president's house at Leland Stanford Jr. University. Here the problem was to adapt the Spanish style

The unusual appearance of the exterior is due in a large measure to the striking use of symbolism very effectively displayed. The purpose for which the building exists makes necessary large wall surfaces which form a most effective contrast for decoration massed about doorways, at the corners of the building and in the broad frieze or cornice which extends around the four sides. The high symbolism which is worked out in the frieze and about entrance portals portrays the development of California and the progress of civilization and the arts. This history in symbol begins with the depiction of plant and animal life, then deals with the early aborigine with his spear and string of fish. In the later development of the symbolism appear

to the use of a structure which is not a public building in the usual sense of the term but primarily a residence which must be also of sufficient size and character to serve the official needs for which the home of a university executive must often be used.

In plan the structure is U shaped with the sides of the U extended at obtuse angles, the wings forming a court and gardens which have been planned to afford a view of distant mountain ranges. The house, a three story structure, presents a very bold interpretation of the Spanish style; ornament, while used with becoming profusion, is not permitted to dominate the exterior but is confined to use at the traditional centers,—about doorways and windows and about chimneys.



Detail of Court Façades

President's House, Leland Stanford Junior University

ARCHITECTURAL & BUILDING ECONOMICS DEPARTMENT

C. STANLEY TAYLOR, *Associate Editor*

Interesting Points from Official Investigation of the Co-operative Plan of Apartment Ownership

THAT the co-operative method of apartment house ownership and promotion holds continually increasing interest not only in larger cities, but in smaller towns throughout the country, is demonstrated by real estate reports of transfers of buildings and the filing of plans for new buildings to be sold on this basis. In the past few issues of THE FORUM many points relative to co-operative ownership and development have been indicated, but a recent official investigation of this general plan of buying apartments brings out added points and strengthens those already outlined.

A few months ago in New York City, where the greatest activity in co-operative purchasing is to be found, Alderman William F. Quinn introduced in the Board of Aldermen a resolution requesting an investigation of the co-operative plan of buying apartments to be made by Tenement House Commissioner Frank Mann. The results of this investigation were outlined in Mr. Mann's report to the Chairman of the Sub-Committee on Buildings of the Mayor's Housing Conference Committee of New York. Mr. Mann in this report has outlined frankly and definitely the requirements which, after investigation, he would demand if he were purchasing an apartment on the co-operative plan, and the various important points in this report will be brought up in following paragraphs with some editorial comment.

Mr. Mann's general comments were as follows:

"As Chairman of the Mayor's Housing Conference Committee I deprecate any attempt to discourage home ownership. I have called attention to the fact that out of 6,000,000 people in New York more than 5,700,000 have no interest in homes. This is lamentable and the principle of home owning should be encouraged.

"There is nothing inherently wrong in selling multi-family houses on the co-operative plan. There is no defect or disadvantage in purchasing on the same plan. There are no more dangers in the pathway of co-operative ownership than in individual ownership of one- and two-family houses. The danger of a purchaser losing his equity by reason of inability to comply with the terms is just as manifest. As a matter of fact, there is less danger of losing one's equity in purchasing on the co-operative plan if proper care is exercised in examining into the character of the sellers and the character of the financing of their operation.

"Were I to purchase an apartment on the co-operative plan I would demand the following requirements:

"*Full Co-operation*—The plan should be surely co-operative—every tenant in the building should participate in the plan."

Two Types of Ownership

As has been explained in other issues of THE ARCHITECTURAL FORUM there are basically two types of co-operative ownership. The first, which is approved by Mr. Mann as above, is that in which each owner is a tenant of an apartment. The second plan is that which involves tenancy of 40 or 50 per cent of the apartments by owners, the balance of the apartments being leased at market rentals in order that the income may offset the cost of maintenance of the building and consequently reduce the owner's rental.

There is no doubt that Mr. Mann's approval of the first plan is well founded in that it is a simple arrangement where all tenants are co-operative owners and consequently there is little room for the management problems involved where part of the space is leased; which means that the operation is not so intricate nor has it as many possibilities of failure as the partial owners' tenancy plan. On the other hand, it must be realized that the plan through which a proportion of the apartments are rented offers strong inducements to the purchasing of stock in the co-operative company, as it is quite possible to reduce the owners' rental to practically nothing if the building is divided and operated on the proper basis.

The latter method of ownership has opened up possibilities of stock promotion and sales at inflated values involving an exorbitant profit to promoters, and this is probably the reason why Mr. Mann does not look favorably on the second plan. On the other hand, there have been a number of successful co-operative projects developed in New York City during past years in which a building was only partially occupied by the owners among whom the equity of a building was divided.

These plans properly developed, and with a reasonable profit for the owner which was charged originally as part of the building cost, have been very successful. In most cases the owners' rent has been approximately 30 per cent of a normal rental established for the neighborhood, and investors in this class of property have received a return averaging from 14 to 18 per cent on money invested.

Mr. Mann's statement should, therefore, be qualified as shown by experience. The first plan of ownership is the best in simple form for dividing equally the cost of maintenance in the building.

On the other hand the second plan offers the best business proposition as it opens up a definite channel for the reduction of maintenance cost as it affects the owner who occupies an apartment in the building, or the investor who has purchased stock in the co-operative company.

The Importance of Location

"*Location*—As co-operative housing is for residence uses, the utmost care must be observed to purchase only buildings in firmly established residential neighborhoods, with a careful selection of the co-operators."

Not only is careful selection of location for a building of this type important, but care must be taken to anticipate the class of residential occupancy. There are many people who would not be interested in purchasing an apartment in a co-operative apartment house if they had any reason to believe that the neighborhood would tend to lose any of the unusual qualifications which call for location at a given point.

It is well known that in the average city certain neighborhoods are definitely classified by the type of people who may be developing homes in the vicinity. Consequently in locating a building of this nature the advice of real estate experts should be sought in order to analyze the trend of development, not only to avoid commercial or industrial development in a city or town not protected by a zoning plan, but to determine as closely as possible the character of residential occupancy which may be expected for years to come. This is often indicated by the price of land, which though high may be desirable because of its value as a determining factor in the class of construction and occupancy which may be expected.

"*Price*—The price at which the building is to be purchased should be its fair marketable value. If it is a new building the value of the land should be ascertained and the cost of construction added, plus a reasonable profit. If it is an old building the value of the land, plus the present replacement value of the building, less a liberal allowance for depreciation, depending upon the length of time the building has existed."

In buying land for buildings of this nature it has proven better to buy land in already well established residential neighborhoods, even though the original cost is much higher than in partially developed sections. The neighborhood which already bears the stamp of high class residential development, particularly if the land is protected against commercial and industrial encroachment through the medium of long term restrictions, offers the best location for a building of this nature.

In general, the building should be located within easy transportation distance of business and amusement centers, and in planning the building a definite class of occupancy should be determined upon and catered to, both in plan and location.

"*Title*—Care should be taken as to the examination of title by the employment of a title company or a reputable lawyer to see that the title offered is marketable, or that it is free and clear from all incumbrances, excepting such as shall be definitely agreed upon."

"*Mortgage*—If the property is purchased subject to a mortgage, the mortgage should be either for a long term with an amortization plan or a savings bank mortgage, which is reasonably certain of permanency, and in no case should the mortgage be for more than 60 per cent of the market value of the property. The plan should include the setting aside of a certain amount annually for the retirement of the mortgage."

As indicated in this paragraph the co-operative ownership method offers particularly good inducements to institutions or individuals having money for loan on real estate. As nearly as can be determined, there is no record of a co-operative apartment house having undergone a foreclosure of mortgage.

In the usual co-operative plan, as Mr. Mann says, a sinking fund is established which will gradually retire the mortgage. Each owner in paying an established owner's rental pays an amount toward this sinking fund. Naturally, as the mortgage is reduced the equity ownership is increased, so that this sinking fund is in effect a savings account to the owner's credit.

Details of Management

"*Incorporation*—Title to the land and building should be conveyed to and held by a corporation made up of the tenant-owners, the charter of which should limit the corporation to the ownership and operation of the building, in order to provide against possible speculation in other enterprises by action of a majority of directors and to insure the proper distribution of the proceeds of the sale of the building should a sale be effected."

The points just outlined should be given careful consideration by the purchaser of a co-operative apartment. He should know definitely what he is buying, and in a restricted corporation as outlined above he does know. Inversely, from the viewpoint of those interested in developing co-operative apartment housing schemes, it is well to realize that this form of incorporation safeguards the investment of the individual stockholder, and is the best and easiest form for successful promotion.

The operation of the building, such as management and negotiation of mortgages and similar business, is usually carried on by a committee of owners appointed often in a ratio of three committee members representing ten individual owners.

"*Management*—It is not practical or desirable for a group of tenants to manage the details of the property. This should be delegated to a reputable and competent individual or firm in that line of business."

The committee of owners, as outlined in the foregoing editorial comment, usually takes charge of the general management of the property. As members of this committee, however, are not expert in this work it is customary and wise for the committee to appoint a professional real estate management company or individual in charge of the details of this work. He in turn usually renders a monthly report to the committee, who approve the report and at stated periods report in turn to a stockholders' meeting, usually every six months or every year, in the form of treasurer's report and general reports.

"*Leases and Tenancy*—The share of the ownership in the building should be separated from the tenancy; a schedule of rents adopted for each apartment which, in total, would provide an income sufficient to pay the expenses of operation and fixed charges, including taxes, etc., a fixed amount to be set aside for the amortization of the mortgage and a balance sufficient to pay a reasonable return on the investment in the form of dividends. Leases should be entered into between the tenant-owners and their corporation, providing for annually renewable leases, containing proper restrictions and the provision that they cannot be terminated except for failure to perform or upon notice from the tenant to the landlord on the first day of July, terminating the lease on the first day of October following, in which event the apartment can be re-let for the benefit of the tenant-ownership corporation. Or a plan should be adopted which should include in the rentals paid by the tenant-owners an income sufficient to meet all fixed charges and amortization, and in addition a sum to meet contingencies.

"Collective or co-operative ownership has many advantages in these days of high living cost, because it reduces the rent of each apartment to its share of the actual cost of maintenance and operation of the building.

"I agree that collective or co-operative ownership as it is particularly applied to the ownership of a home in the City of New York, where the majority of our population must for economic and other practical reasons reside in apartments instead of individual homes, in addition to securing a home from which one will not have to move, brings down the rent and affords a safe and profitable investment, when the plan of ownership requires the payment by the tenant-owners of a sufficient income to meet all fixed charges and amortization, and an additional sum to meet contingencies.

"I emphasize this particular feature for the reason that the average family are not certain as to how long they may be able or desire to remain in one location, and they should be free under the terms of their purchase to vacate the premises and, if they so desire, retain their investment.

"Under the tenant-ownership plan the tenant is protected against increase of rents and is assured a permanent home, and is afforded a safe and profitable investment. There is no better asset to a community than for its citizens to be interested in home ownership."

Practical Methods of Financing Home Building Projects

THE acuteness of the housing situation still continues, and the most difficult problem involved is that of obtaining financing. In a number of cities and towns where the pressure of industrial need is added to the general housing shortage, various methods of solving the financial question have been developed, and as this subject is of general interest and of application to the business of the clients of many architects, we will from time to time present brief analyses of successful methods of financing which have been developed.

In Detroit, where an acute housing shortage exists, probably the most successful plan of financial aid has been developed by the House Financing Corporation of which Mr. Eugene W. Lewis is President and General Manager. This Corporation has been organized and financed by a number of large employers in Detroit and it has as its purpose the financing of home building on a basis which offers a fair interest return on money invested.

The House Financing Corporation was organized about one year ago to carry out its activities under three plans. These plans are known as:

1. Banking Plan
2. Operation Plan
3. Contractor's Financing Plan

The plans are described as follows:

1. *Banking Plan*—Under this plan any one owning a building lot may have a house erected thereon by the Corporation, either after his own plans and specifications, which the Corporation must approve, or from the plans and specifications furnished by the Corporation. The result of the investigation of an application and investigation department indicates the maximum amount of money that should be loaned to the applicant, stating the sum that the investigation shows the applicant may carry without particular handicap to his other domestic requirements. The Corporation loans up to a maximum of 80 per cent on its appraisal figure of the house and lot.

2. *Operation Plan*—Under this plan the Corporation employs its capital direct by purchasing lots *en bloc* in various parts of the city, erects its own houses thereon and makes the sale of them after completion. At this time it owns about three hundred such lots on which it is conducting building operations, erecting from six to twenty on each property. As will be noted, this plan will add a great number of houses, but it will not produce quickly enough the large number of homes necessary for the proper relief of the situation. Careful

study of conditions and reports from those in best position to have full and accurate knowledge of the facts, indicate that something over two-thirds of the houses erected during the last year in Detroit have been built by independent contractors, either as individuals or as building firms. In other words, this large number of houses has been produced by men who use their capital in purchasing lots and building houses thereon for sale. It is quite obvious that any plan which would keep this great factor from slowing down, in fact, could stabilize and increase this effort, would be of great benefit to the city and further conserve the purposes for which this Corporation was formed.

3. *Contractor's Financing Plan*—This seems to provide what is necessary to further stimulate building and assist in securing the results so much desired for relief of the city's housing proposition. Under this plan the Corporation cannot only keep its capital in more liquid condition, but it secures the distinct advantage of having, literally, hundreds of contractors working for it and the city on a stabilized and assured basis to the contractor. The Corporation has supervision over the type and character of house that is to be built, the price at which it is to be sold to the customer, and can indicate the localities in which these houses should be built, thus securing building operations in the localities where they are most needed. Contractors engaged in independent building operations during the last year have, for the most part, tied up their capital, the income or turnover from it not being sufficient to enable the contractor to continue to do building work on anything but a small scale, if at all. This Corporation finances temporary loans on collateral notes, if necessary, in order to get the contractor started on a new operation. It then finances the building operation from time to time as it progresses under its plan in detail, by taking the contractor's three-year collateral note.

The above is a short résumé of the three general plans under which the Corporation is operating at this time, and as indicated, it will be noted, they are different in character and would seem to cover comprehensively — though in different ways — a practical solution for the quick and stable relief of the situation. The organization is complete in its various departments for proper operation and conduct under these plans, its effort and the result being limited only by the amount of capital available.

As the requirements of the situation call for a large and extensive building program, it is essential that a large amount of fixed capital be available and employed. As soon as this fixed capital is practically all invested, a plan for revolving it will be instituted. This revolving of funds will, of course, be based upon the securities of the several kinds that have been developed in the conduct of the business. These securities form the safest kind of diversified collateral and will make a most attractive investment.

Some of the Results

Some interesting details of the working out of this plan were brought out in a discussion with Mr. Lewis. The types of houses which are constructed or financed are developed at the lowest possible cost to meet the need of the industrial classes. Any individual applying for assistance in home building must be an American citizen and no house is financed in which the cost of maintenance and ownership will exceed 25 per cent of the owner's income.

It has been the experience of the House Financing Corporation that there have been few applications under Plan No. 1 for individual home construction owing to the fact that much of the real estate purchased in Detroit has been on a speculative basis and that individual home building has proven so expensive as to discourage this method of solving the housing problem.

Under Plan No. 2 as outlined, the Corporation has already built a large number of houses. These houses are designed in the offices of the Corporation and contracts are let to contractors experienced in this line of work, who are allowed approximately 12½ per cent profit on the operation, which carries also the overhead of the Corporation amounting to about 5 per cent more. These houses are sold to individuals on easy terms.

Under Plan No. 3 many builders have been assisted. This plan contemplates the creation of liquid capital for the builder who otherwise must wait for the use of his capital until his houses are sold. The introduction of this plan found many contractors in Detroit entirely stopped in the production of homes because they had tied up all their capital and were forced to wait for sales.

In selecting the contractors to be benefited through Plan No. 3 Mr. Lewis stated the Corporation's attitude as follows:

"The best builder for this class of construction is not the big builder or the builder of houses costing $15,000 or $20,000. He is the man who has been active in the construction and sale of low cost dwellings."

In assisting builders under Plan No. 3 the House Financing Corporation controls the sale price of the houses in order that there will be no exorbitant profit. A profit of about 15 per cent is allowed to the builder, together with a fair profit on the lot determined by appraisal.

Export Trade and the Building Situation

IN the June issue of this Department of THE ARCHITECTURAL FORUM there was presented an article, "General Business Conditions as They Reflect on the Building Situation," which has resulted in some interesting comment. Among the letters received was one which brought out several definitely interesting points. This letter, together with the editor's reply, is printed as of general interest to those who are giving thought to future conditions which influence the building situation.

The following letter was received from a New York architect:

"First of all, there seems to be some doubt in business circles as to whether the crest of the wave of business actually has been reached, and it is pointed out that we now depend to quite some extent on world conditions. The world at large seems to have empty shelves and is only now and very slowly getting into condition to replenish.

"In the market for building materials and appliances we must recognize the fact that a great many new consumers have appeared and their number is increasing. The house famine is universal and severe, indeed practically no relief is in sight while the financing is becoming increasingly difficult.

"Before the war England and Germany enjoyed an enormous foreign trade in such materials. Both are now suffering from a severe house famine and material prices easily three or four times those of 1913. Scarcity of labor, high wages and impossible conditions of transportation also exist. In fact our labor troubles are a mere nothing compared with conditions in Europe. On the other hand, Europe lacks the organization and labor saving machinery which has been built up in this country during the last forty or fifty years through the competitive system in an effort to meet the steady rise in the prices of labor and materials. How will Europe meet the new conditions?

"Is it not reasonable to assume that there will be a heavy drain on our building material market, at least for many years, while a new system is being built up elsewhere? There will be an end to wildcat war conditions without a doubt.

"If I might make a suggestion it would be on the desirability of studying the approximate requirements and economic strength of our foreign customers for the next few years. A good many of our manufacturers of building materials are increasing their facilities even to the tune of 200, 300 and 400 per cent, at least in some departments. That is a good indication of their view of the coming market. Altogether it certainly is a puzzling condition, and one very difficult to survey."

Following will be found the reply to this letter:

"We have for some time been puzzled, as many others undoubtedly are, regarding the influence of European business in its effect on the stability of material prices in this country. It is very difficult indeed to measure this effect. As nearly as we can determine from contact with building material manufacturers, particularly those who have had recent experience in selling abroad, it would seem that the increase in their production facilities as referred to in your letter is largely in view of a steady volume of domestic business which the shortage in buildings of every type would seem to call for.

"We do not think the average building material manufacturer places much confidence in a volume of foreign business. Primarily we believe this is true because the general experience of those who have attempted to sell in foreign countries has been somewhat discouraging. The cause for discouragement is, to a certain extent, a strong tendency on the part of foreign buyers to procrastinate. Behind this procrastination, however, there seems to be a tacit organization against any dissipation of economic expenditure. By this we mean that in France, for instance, the tendency seems to be that, as expenditure on forms of material involving labor must be made within the country, the general tendency is to encourage local production in every possible way; and secondarily to purchase from war weakened powers which have received national credit from France.

"The same condition is met to a greater or less extent in other European countries. We believe that the production of building materials in Europe will be increased to an extent never before known in order to meet the need in the reconstruction program of European countries.

"After all, is it not logical that this should be the case? The war drained European countries have very little credit to exchange with this country for necessary materials of reconstruction. Their credit has already been overstrained in purchasing the necessary materials of war, and they are following, perhaps far more than we realize, the trend which always comes when the credit of a nation is expended, outside its national boundaries. In other words, the flow of money has been steadily outward —not from the government to its people, which in a sense is a passing of money from the left hand to the right—but from the government to the people of another state.

"This money—or credit, if you will—has been expended, as already stated, largely for materials of war. If it had been expended for materials of industry it might ultimately be returned in the form of production. But the expenditure for war material is an unfortunate expenditure, in that the volume of credit so used is almost totally destroyed and is possessed of no investment feature. By this we mean that in purchasing munitions from this country and in the use of this war material in destructive form, the value of the amount of national credit so used is gone forever.

"On the other hand, where machinery for industrial production is purchased, this machinery is used for local production and consequently returns the investment with profit."

Constructive Analysis of the Building Situation

SENATE COMMITTEE ON RECONSTRUCTION AND PRODUCTION GIVES SPECIAL ATTENTION TO BUILDING

THROUGH the efforts of Senator William M. Calder a Special Committee of the Senate on Reconstruction and Production has been created. The purpose of this Committee, of which Senator Calder is Chairman and Senators Kenyon (Iowa), Edge (New Jersey), Wolcott (Delaware) and Gay (Louisiana) are members, is to investigate building and all forms of housing throughout the country and all industries upon which the construction industry is directly and indirectly dependent. Senator Calder in a speech in the Senate of the United States has commented in regard to this Committee as follows:

"In my opinion the adoption of this resolution by the Senate is a timely act, recognizing as it does that structural development is necessary for the fuller utilization of the nation's resources, for the production of its essentials, and for the amelioration of its housing conditions, and that construction was curtailed by the war and is now hampered by an unprecedented demand for consumables.

"The scope of the Committee's work is necessarily extended because of the interdependence of the various factors, it being evident that construction cannot proceed without transportation, labor, and capital, and that construction of all kinds is necessary for increased production.

"The time allotted to the Committee is comparatively short. Accurate and detailed information is essential. In order to amplify and verify data otherwise obtained, it is the desire of the Committee that it may receive from the senators and congressmen their personal knowledge as to home conditions, together with their suggestions as to means to relieve these conditions."

The construction industry to-day is in great need of a constructive investigation of this nature. It can confidently be expected that in this investigation information will be developed which will tend to show more clearly than ever before the position of the construction industry in our economic structure and the actual hampering conditions which are to-day holding back the great volume of active and beneficial production in this line.

The fundamental problems of the construction industry would seem to be in order of importance as follows:

(*a*) Finance
(*b*) Transportation
(*c*) Labor

Building to meet the acute shortage of homes and the general shortage in other lines of construction is definitely discouraged through the lack of financial support in the form of building loans and mortgages. As a reason, or an excuse, for this attitude on the part of loaning interests, the unstabilized condition of building material prices and labor cost is advanced. Actually, however, it would seem that investment funds are being directed to other lines which offer greater interest or profit returns. If mortgage money were made available a great volume of construction would proceed; and with better transportation conditions it is felt that the building material producers in this country would meet the demand on a fairly stabilized cost basis.

Government housing is a fallacy for many reasons, particularly its effect in stifling competitive or speculative building. On the other hand it would seem entirely feasible that federal credit might be properly used to encourage the availability of building loan and mortgage money for those types of construction most necessary to aid in the increase of industrial production.

Manufacturers everywhere are hampered by a lack of housing for their human machinery. Consequently the volume of production which might be expected from them as individual units is often in exact ratio to the quality and proportion of employees limited by lack of housing and proper community facilities. It is common experience in practically any industrial center today to find employers making statements that they could use 200 to 300 more men if they had places for their families to live. In many plants which are fully manned the quality of labor is low because turnover is high owing, to an extent not realized by the average manufacturer, to a shortage not only of housing facilities but of proper community facilities.

The Committee on Reconstruction and Production has sent out to architects a letter asking for information as follows:

"It is possible that through your practical and everyday familiarity with the situation as an architect, you can supply the committee with information as to the shortage of housing and industrial construction in your locality, whether such shortage is increasing or decreasing, and the effect of such shortage upon public welfare and industrial development. The Committee would be pleased to learn your views as to the factors contributing to the shortage and also to be informed as to any remedial measures which have been undertaken to relieve the situation."

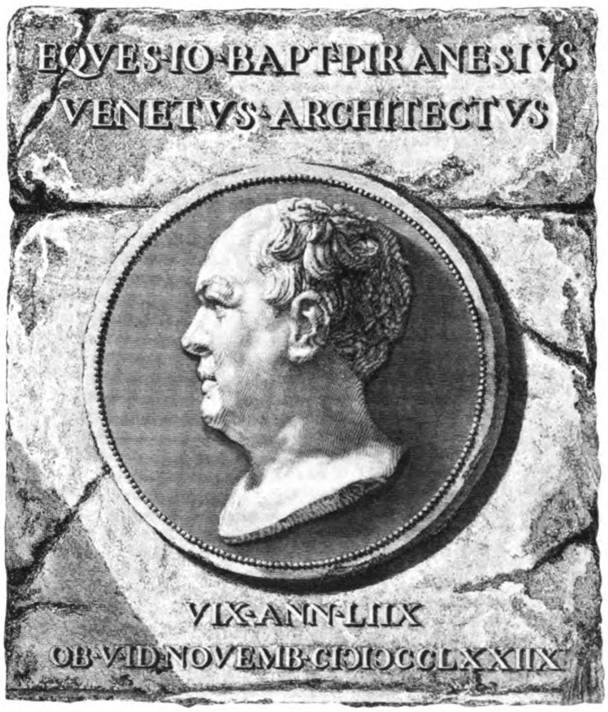
It is hoped that every reader of this publication will realize the importance of the work of this Committee and the value of Senator Calder's well known activities in behalf of the construction industry. Each reader may share definitely in bringing about better conditions not only in the building industry but throughout the architectural profession by sending to this Committee, whether solicited or not, any pertinent information.

Piranesi — Style Maker

AND SOME SUGGESTIONS AS TO HOW A GOOD BOOK MAY BE BETTER USED

By RICHARD F. BACH, *Metropolitan Museum of Art*

THE difficulty of doing some things is surpassed only by the pleasure of making the effort to achieve them. For instance, one might attempt a critical appraisal of Piranesi's work, but his fondest admirer would fall as far short of the true picture as would his sharpest foe. A giant of graphic art, "the Rembrandt of architecture," he stands above his time and compeers; however easily Michelangelo saw over the heads of his fellow carvers, Piranesi as handily outstripped other etchers and engravers of his period. His value to his own century was negligible as that century saw it (his splendid series entitled *Le Antichità Romane* brought him seventeen lire!), but as history has come to regard him, his labors have been credited not only with the greatest high-quality output that has been recorded for any man, but also as the influence which gave the requisite final impetus to the empire style; this, some claim (among them the critic R. Phené Spiers), Piranesi practically made out of hand. He succeeded, furthermore in developing within this style a Piranesi vogue of his own,—as great performers in any field are bound to do,—so that he comes dangerously near to figuring as a style "creator" or, in the expressive English of to-day's business world, a style "promoter." All the more accurately does this description apply to him in that he may be said to have launched a boom in design, especially architectural design, which appears plainly in at least one of his books, as we shall see. He disapproved of current practice, made a conscious effort to improve it by reference to better originals in antiquity and sowed a seed that multiplied beyond his wildest dreams and quite probably, in most cases, contrary to his hopes.



Medallion of Giovanni Battista Piranesi

Giovanni Battista Piranesi (1720–1778), a most ambitious Venetian, can hold the mirror to the master craftsmen of all times. A consuming creative impulse drove him to work untiringly and impetuously; sometimes, perhaps not very wisely or too well, yet in the many volumes of his work only a rare plate falls below his customary excellence in either conception or technique. A careful student has found that he produced some 2000 plates by his life-long industry or, quite accurately, one plate every fortnight of his working career.

Piranesi's mind was a combination of architectural and graphic thinking, both of such high excellence that he was willing to let neither be sacrificed to the other, and the cumulative effect was such a prodigious output that he has been suspected of maintaining a *bottega* in the nature of a factory, similar to to-day's "plan factory" of ill repute. Of this there is no proof. But the Italians have since established such a factory under royal patronage at the *Calcografia Reale* and have in dunder-headed good will reproduced from his plates, now carefully steel coated and re-etched, a myriad of seventh rate prints, clouding their author's reputation, damaging his work, and, we might almost say, really helping many architects toward higher thoughts in design because the lower price brings these prints within reach of their purses and enough of the artist's strength remains to offer no little inspiration and suggestion.

The immediate cause of these ruminations, which have been set down as they trailed one another in the course of a perusal of the work, is a volume by Piranesi, not by any means his best known, yet one of his most characteristic and direct products; it has the title *Divers Manners* *of Ornamenting Chimneys and all other Parts of Houses taken from the Egyptian, Tuscan and Grecian Architecture with an Apologetical Essay in Defense of the Egyptian and Tuscan Architecture.* Its text in the first edition, which bears date of 1769, is in Italian, English and French and there are sixty-five plates. We have heard much of Piranesi's *Prisons*, his *ruins* and other collections of engravings,—which we should designate etch-engravings, for he used both processes together, — but we see only occasionally any reference to his designs for ornament. His *Prisons* or *Carcere d'Invenzione* are one hundred per cent pure imagination, his plates showing ruins at least eighty per cent so,—stage ruins we might call them, for he was a conceiver or designer of ruins as well as an engraver of them. Our scenic artists would give an eye for such a ruin as he could make out of one broken stone and a stray weed, for these would grow in his mind to hills with dismantled temples overgrown with foliage, nature's protest against their further desecration. Piranesi loved ruins, and that because, as sources of design, as fountain springs of imagination, he saw in them the beginnings of an endless procession of new form combinations. What is more, he had a profound architectural consciousness, a constructive method of thinking and of working; he found no difficulty in completing the architect's thought, as seen in the tumbled remains of his building. It is therefore to be counted our good fortune that he has left us such books as this on fire-places, in which he rides his hobby as hard as ever, but reins it in to show, in a way, that it is really a perfect horse. In the present volume he comes down to earth and does not dislike its solidity; his plates indicate such reasoning and such results, from the standpoint of practical utility, as will outweigh any distaste for his thesis.

This latter he states in his introductory pages, giving it the title of *Apologetic Essay*, a name which implies a halting "I beg you," but which conceals a stern face, a fiery temperament and the not uncertain words "I dare you."

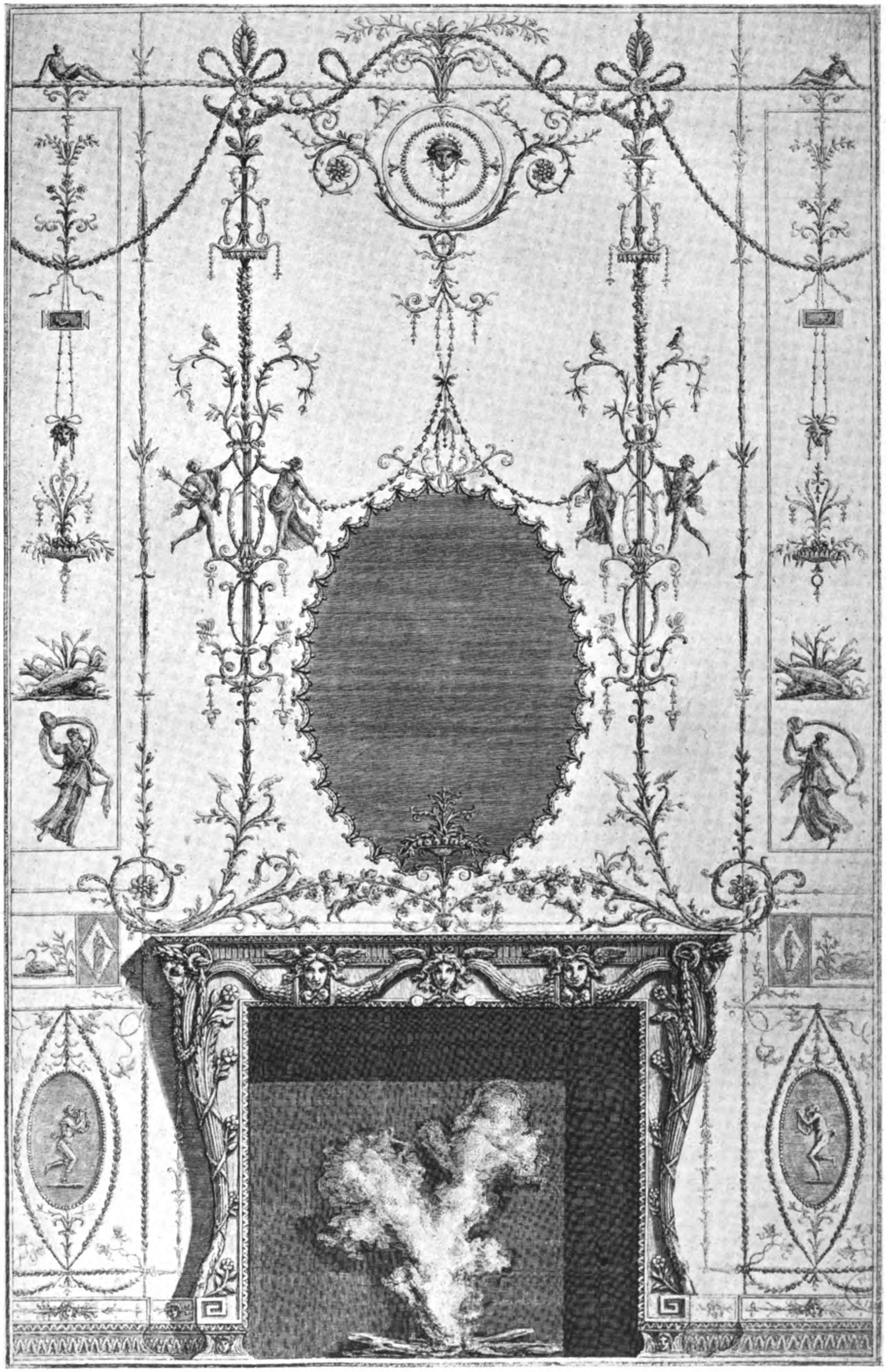
A benison on the inventor of the preface. Piranesi tells his story in his preface, which is an account, a defense, an apology, an attack—and a satisfaction. He was a plain spoken fellow and, I dare say, ready with his fists, if his style of writing is an indication of his willingness to maintain a cause. When you are through with his preface you will agree with him and vow to buy this book if it takes a life's earnings as a professional designer; or you will despise his point of view and at the same time hold on to his book for its out-and-out design value. For many a one, as for the humble writer in this instance, it will bring encouragement and admonition in a breadth, satisfaction and a compelling desire to indite without delay an *apologia pro vita sua*, as Cardinal Newman did, to set down clearly his own faith and the reasonable foundation for it, so that he himself might see it more clearly and assure himself of its convincing tone.

On this preface might be based a workable catechism, a series of leading questions answered by quotations from Piranesi and illustrated by his plates from this book. You will not always agree with him—or his renderings; you will decry his monomania but you will catch his enthusiasm, which is the burning fire of design. There are no cold blooded designers! His renderings are always fine but in modern interpretation we would miss the water color shadows that are always suffused with light, because this is the stronger and reflects when it cannot penetrate. His personality and his medium prompted strong contrasts,—flat contradictions, black on white, high noon and abysmal darkness, with solid obstructions to cut the light. It is notable that any modeling remains in his work when he favors so often a striking offset as plain as that of black type on white paper.

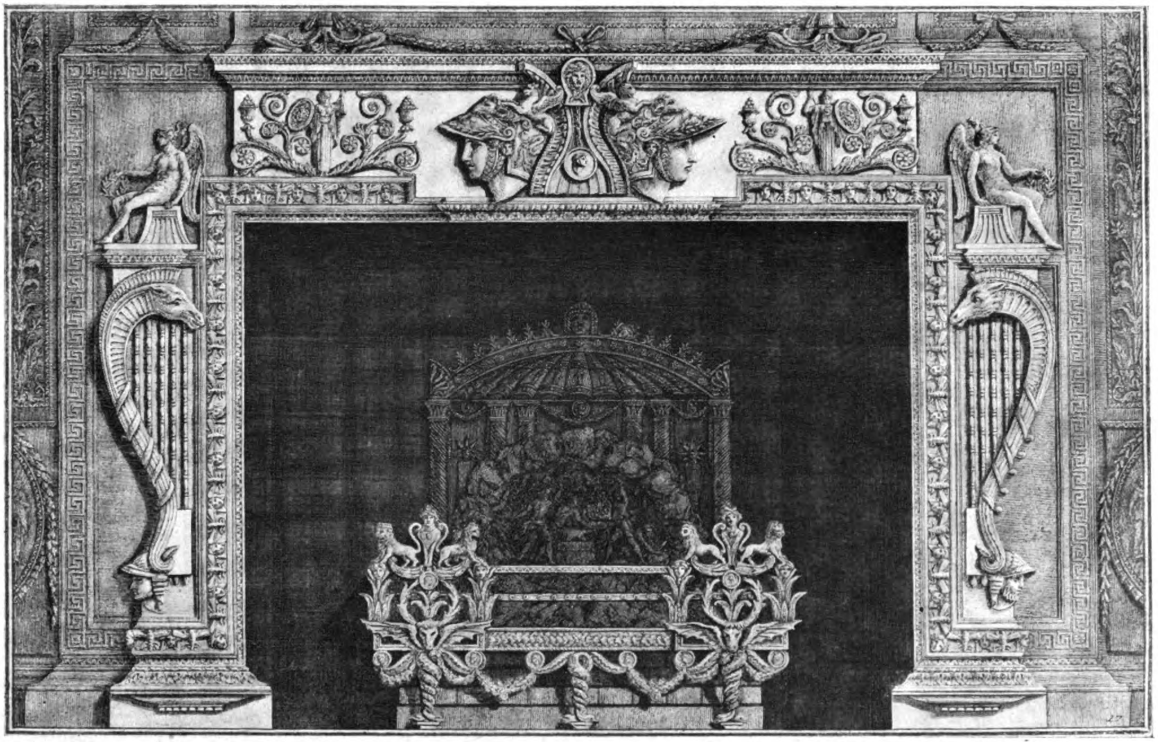
But our business is with Piranesi's text; let us read with him. First he wants to set at rest any doubt we may harbor regarding the existence of chimneys in the periods from which he draws his motives. "No one," he says, "in reading in the front of these my designs: *Divers manners of ornamenting chimneys, etc.*, will imagine that these designs which I give to the public are really taken from chimneys which were in use among the Egyptians, the Tuscans, the Greeks and the Romans; whoever should think so would be much mistaken." We are told that the author was "well apprized" of the controversy as to chimneys among the ancients and he quotes authorities. Pioneers are often naïve.

The purpose of the undertaking is then stated: "What I pretend, by the present designs, is to shew what use an able architect may make of the ancient monuments by properly adapting them to our own manners and customs. I propose shewing the use that may be made of medals, cameos, intaglios, statues, basso relievos, paintings and such like remains of antiquity, not only by the critics and learned in their studies but likewise by the artists in their works uniting in an artful and masterly manner all that is admired and esteemed in them: whoever has the least introduction into the study of antiquity must plainly see how large a field I have by this laid open for the industry of our artists to work upon; and such as have not that advantage will easily comprehend it on casting an eye over the following plates." The architect must be "able"; there is wisdom in that reservation. If he is not "able," he will not "use" the ancient monuments; he will "crib" from them. Note the inclusive lists of arts which may contribute to the architect's advancement; most of our architects barely have time (or *take* time) for an architectural periodical, let alone for a book on Greek coins or mediæval costume, or even Italian mural painting.

In succeeding paragraphs we may find a parallel



Example of a Chimney-piece with Overmantel of Pompeian Motifs by Piranesi



Fireplace of strong classic tendencies with figures and warrior heads of numismatic or cameo derivation as chief adornments. The familiar fret attributed to pre-classic days but better known as a Greek unit and the bee chosen as symbol of the Bonapartes occur on the dado and architrave

for our own day and at the same time some age-old philosophy that architects should be born with but which each learns by dint of much laborious grinding, and an appreciation of what the Japanese call the 'art of omission.' "The study of Architecture, having been carried by our ancestors to the highest pitch of perfection, seems now on the decline and returning again to barbarism. What irregularities in columns, in architraves, in pediments, in cupolas; and above all what extravagance in ornaments! One would think that ornaments are used in works of architecture not to embellish them but to render them ugly. I know indeed that in this the caprice of those, for whom the buildings are made, has often more part than the architect who makes the design. . . . A military man will have arms and instruments of war everywhere, whether they be proper or not. A sea-faring man will have ships, Tritons, dolphins and shells. An antiquarian will have nothing but ruins of ancient Temples, broken Columns, Statues of Gods, and Emperors. Let them have their will, for no curb ought to be put on such caprices of men but then let them be executed according to the rules of art. Let Tritons and fish be placed on chimneys, if it be so required, but let them not so cover the frame as entirely to hide it or take away its character. Let the architect be as extravagant as he pleases, so he destroy not the architecture, but give to every member its proper character."

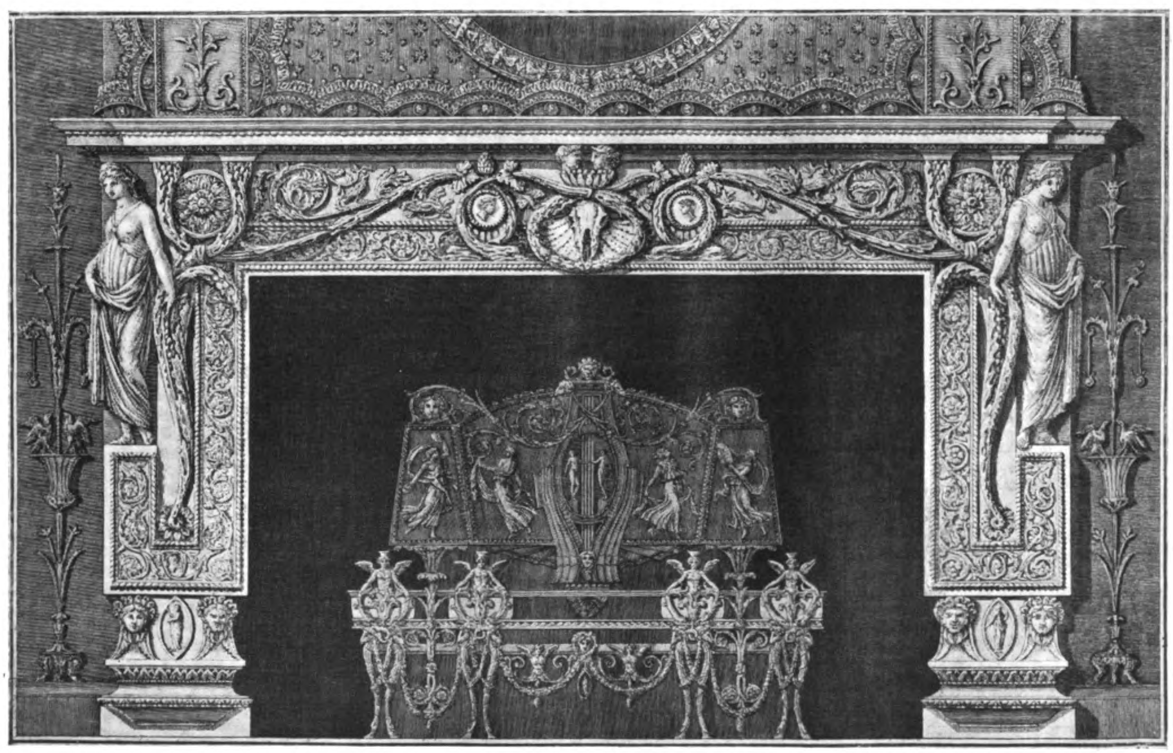
Graces of architecture, yes, but they must agree with it, for the old-time requirements of decorated construction as against constructed decoration can make or break the designer, though he be architect or dramatist, painter or poet. A century later Owen Jones in his *Grammar of Ornament* makes this his Proposition One.

But there is hope if the sufferer from then current ignominious forms of design will but turn back the leaves of history to the time when the ruined buildings used as quarries all about him were the glory of the world's greatest empire. "We ought . . . to observe the kinds of ornaments used by [the ancients], the manner in which they disposed them to make them harmonise with the whole, and the modifications by which the Egyptian and Tuscan manners were adapted to another species of architecture."

And in his own time Piranesi found fault with men whose names shine forth in our architectural histories. "Some . . . who excelled in the great parts of architecture are wanting in the small ones; others have boldly raised themselves and shewed the greatness of their genius in the daring flights they have taken in imitation of the ancients, but they have not always been able to sustain themselves, but have lost sight of the antique, to give themselves up to the bad taste of the times in which they live." Palladio and Peruzzi, guides and models for the students in our schools of architecture, divine inspirers of *projets* galore, find no mercy at Piranesi's hands. They lack coherence or unity, they break the thread between the exterior and the interior. Baldassare Peruzzi, whom Vasari, chronicler of them all, called "that most excellent master," according to Piranesi "does not keep up his credit in what he proposed to himself at first." This refers in particular to the Massimi Palace in Rome, but is accompanied by such a criticism as would seem to damn much else of his.

Another lesson, then, and one of vital importance in these days when architects want to be decorators but don't know how to go about it, and when "interior decorators" by the score are doing in an inferior way what the architects' taste should readily compass. It is obvious that the decorator must know at least as much of architecture as a qualified dentist must of medicine,—though we incline to the view that a true decorator, a Pheidias or a Michelangelo, should be a sort of super-architect, so great must be his knowledge, so painstaking his restraint. Otherwise the ornament overwhelms the structure and becomes the only guide to public taste. Says Montesquieu: "A building loaded with ornament is an enigma to the eyes, as a confused poem is to the mind"; and in another place Piranesi himself has it: "I look upon the harness in which horses are nowadays wrapped up, like children in swaddling clothes. . . . The ancients practised the reverse; they wisely thought that the most beautiful ornament of a horse is the horse himself. All these trappings, however sumptuous and gaudy, load, but do not beautify the object." We find the solution in "a more profound study of antiquity [which] would have furnished these great men with a greater abundance of ideas, and the small architecture would have been of a piece with the great. If our present architects shall apply to this study, they will not need to be afraid of being upbraided for want of erudition, when called upon to work after the manner of the ancients." It is the time-old study of comparative significance of all features, of relative values, of leading lines and axes, of rhythm, proportion, movement, that the designer must make his mentor; so that "a multiplicity of ornaments" may not destroy "a graceful and pleasing disposition of motifs," and posterity will not say of his work as Piranesi did of the work of his contemporaries: ". . . but if the whole be considered, O Dio!"

But lest we carry away the impression that the ancient styles are flawless he hastens to make clear that they are for inspiration and influence only, not for sole sustenance, saying, "No, an artist, who would do himself honor, and acquire a name, must not content himself with copying faithfully the ancients, but studying their works he ought to shew himself of an inventive, and, I had almost said, of a creating Genius; . . . the human under-



Fireplace with Roman acanthus rinceau as the dominating feature. Fireback of the attenuated classic forms and dancing Naiads adopted in a large measure by the Brothers Adam in their decoration standing is not so short and limited, as to be unable to add new graces, and embellishments to the works of architecture, if to an attentive and profound study of nature one would likewise join that of the ancient monuments . . . the vein is not yet exhausted, new pieces are daily dug out of the ruins . . . capable of fertilizing, and improving the ideas of an artist who thinks and reflects." Is this last expecting too much? Is it contrary to temperament?

Finally Piranesi throws the gauntlet, truly as a proud *romano*, though he was but a *romanesco*, having been born in Venice. "Rome is certainly the most fruitful magazine of this kind. . . . The Roman School, founded upon these monuments, will continue to be the Mother of good taste, and perfect design, which are the distinctive marks of her superiority over all others, and which bring such a number of hopeful youths from different nations into her bosom, there to learn the perfection of design." How little these things have changed! France there is and her teaching; Gothic has come and gone again as a revival, though it still lives and will continue among us, burning brightly in the hearts of some of our great architects. Other styles have flickered for a moment. But Rome, the fountain source, is with us as strongly as ever; that fire seems to be sacred, certainly to the profession here it is sacred, whatever tribute they may ungrudgingly pay to Greek and Gothic.

There is, then, a value in this folio of chimney-pieces, apart from its value as a collection of admirable engravings and as a splendid piece of typography. There is, besides these, the triple merit arising from first, its place in stylistic history; second, the mode of thought fostered by the author, *i.e.*, his attitude toward design in principle and toward historic originals (and, we may say, that in such things attitude is everything) as seen in his *Essay;* and third, the performance of the author in his plates, where he functions purely as a designer.

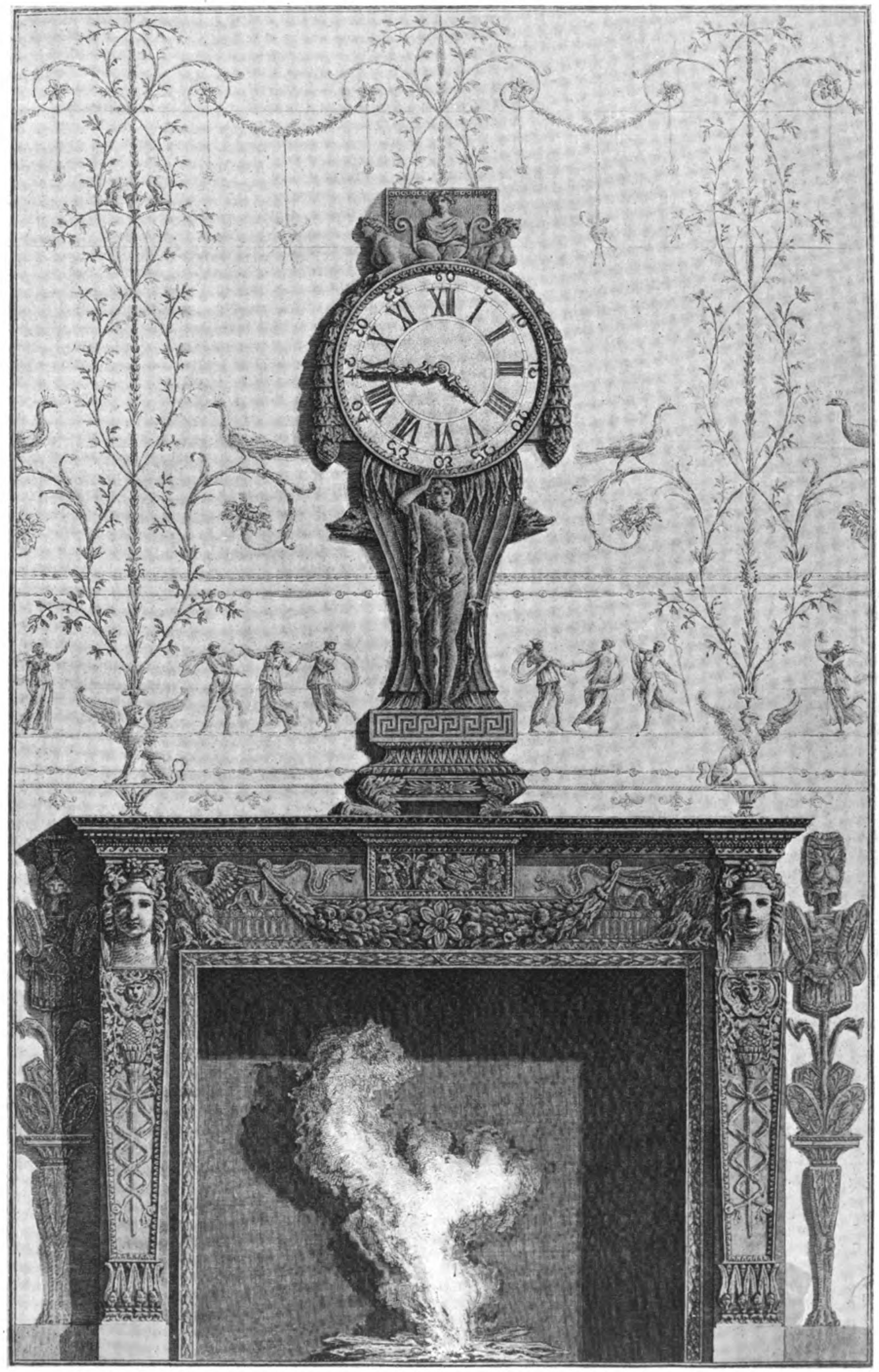
Historically the book belongs and the man belongs in the time when the realities of ancient life began to attract men who saw in the excavations and measurements of ancient monuments and other types of art possibilities for a saner outlook and respite from the vagaries, bombast, false restraint and general immorality in artistic thinking to which all the eighteenth century styles succumbed, until the same slough of despond swallowed up the empire style as well. Winckelmann was a leader among the classical students—a scholar and a pioneer but not a producing artist. His books on the criticism of antique works of art found ready response; Lessing followed him with the famous *Laokoön*. The findings at Herculaneum and Pompeii (1710 to 1750) brought ocular evidence. Everyone clamored for more facts; here was reality, splendor of true greatness—the overbearing autocracy of much of it they did not see, for it was natural to their environment. Piranesi was quick to feel the pulse of the time; in fact, it was his own pulse. Ancient Rome was to him the apex of human achievements and desires. He worked feverishly, throwing a spell over the ruins and confining their atmosphere in his numberless plates.

But as the Roman adherents grew in strength, a Greek camp sprang up. There also measurements were made; new-old things were found and published. In both peninsulas scholars and artists, architects and princes traveled, saw, wrote, and above all, met. All carried the germ back to their own countries and preached the new gospel. Books were written in number: Caylus on travels in Greece and Asia Minor, Wood on temples at Palmyra and Baalbec, Adam on Diocletian's Palace at Spalatro, Houel and d'Orville on temples in Sicily, Stuart and Revett on Athens. Among these Piranesi's work stands preëminent; he caught the imagination while others worked as archæologists purely. While they were students and worked with their pencils, he was a protagonist and fought with his burin. The Greeks had to be put down, and some believe that this book on Chimney-pieces was a counter thrust to weaken the effect of David Leroy's *Les Ruines des plus beaux Monuments de la Grèce*, published in 1758.

The cult of the ancient things grew out of all proportions. Jean François Belanger, pupil of Leroy,—refiner of Piranesi he has been called,—designed furnishings for the hôtel of Mlle. Dervieux of which Brogniart had been architect in 1774. Père Lesueur's cellule at Trinité des Monts was designed by Clérisseau in faddist classic: an entablature served as table, capitals were chairs, a Roman bath tub became a bed and for secretary a sarcophagus!

Many Frenchmen were in Rome when Piranesi was at the height of his ardent apostasy, and no small number of these, and of Englishmen as well, were kindled by his enthusiasm and took away with them the mark of his influence. Augustin Pajou was there, so also Jean Antoine Houdon, Jean Jacques Caffièri and Clodion, all sculptors; and Chalgrin, architect. Important was the *grand tour* made by Abel Poisson, brother of Mme. de Pompadour, arch style maker second to none, who was later to take up, as Marquis de Marigny, the duties of *Surintendant des Beaux-Arts*. With him in the years 1749 to 1751 traveled (as tutors we surmise), Soufflot, architect of the Panthéon, and Charles Nicholas Cochin, *fils*, engraver.

What is more, Robert Adam was himself favored with three engravings by Piranesi who also dedicated to him his work on the Campus Martius. There are in this many suggestions for the proper allocation of influences seen in Adam work in England. George Dance, Jr., architect of old Newgate Prison, distinctly was debtor to Piranesi who actually assisted him, as were also Robert Mylne, designer of Blackfriars' Bridge, and Sir John Soane



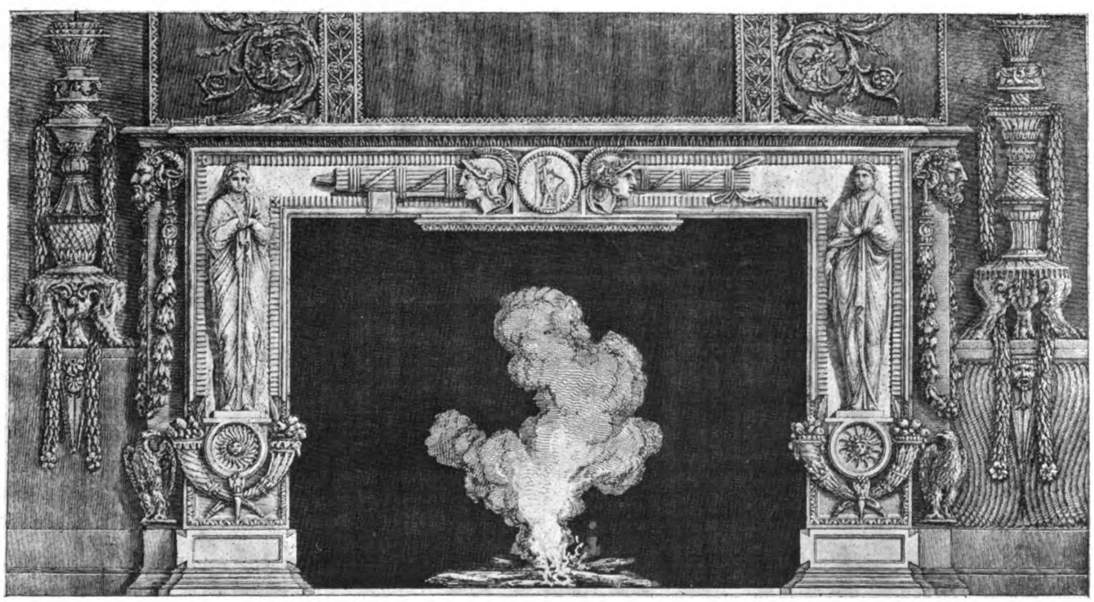
Design Showing Piranesi's Attention to Accessory Details whose bank is the hub of the British Empire.

Percier and Fontaine met in Rome in 1786 and there cemented that friendship which only death severed. They spent six years in Italy. After their return to France they published *Receuil de décorations intérieures comprenant tout ce qui a rapport à l'ameublement, comme vases, trépieds, cheminées, tables, secrétaires, fauteuils, etc.* This was in the Year XI of the new order of things which followed the first break of the Revolution in France. In 1812 the book was reissued with a *Discours préliminaire*, plainly a duplicate of Piranesi's *Apologetic Essay*. This work also was a revulsion but against prevalent abuses in France, as Piranesi's had been against those of his day in Italy. By 1788 the Empire style was definitely under way and its momentum soon carried it to extremes, formal, frigid, imperial, lifeless, uncomfortable and so doomed to an early demise.

So Piranesi's work was done; had he not sought to build so fast his structure might have had a longer life. But his record was written in every country and the greatest heads bowed to his genius —but not in his lifetime. Now he is gradually attaining the position he deserves. His broad interpretation of the architect's functions, that scholarly angle toward his work without which the architect's vision is limited, these he possessed in admirable proportion.

It is rarely given to one man to create a style, but an occasional wonderman strikes close to that mark. Such a wizard was Piranesi, as is seen in the book which has prompted these effusions. It is an argument for sanity rather than suavity, sincerity not subtlety, vigor and virtue, not fervor and fustian. In closing his *Essay* Piranesi says: "I hope that many will consider themselves debtor to me for this labor: but I do not flatter myself that I shall escape the censures of many others who, by reason of an inclination to criticism, or a turn of mind never to be satisfied, find fault with everything. . . . But there are sometimes reasonable and discreet critics who, out of a love to truth, and for the public good, make use of that equitable freedom, which every man has, of examining whatever is exposed to public view, of exposing its defects and making out its imperfections. To despise the opinions of such, would be a self-sufficiency and presumption not to be suffered." Need more be said?

Old books need not be good books, but a good old book is a blessing.



An elaborate ensemble of familiar Roman fragments with an alternative arabesque arrangement at either side typical of Piranesi's facile delineation

DEPARTMENT OF ENGINEERING & CONSTRUCTION

CHARLES A. WHITTEMORE, *Associate Editor*

The Automobile and the Private Estate

PART V (CONCLUDING PAPER). SERVICE COURTS, PARKING SPACES AND GARAGE LOCATIONS

By TYLER STEWART ROGERS

IN the design of service courts utilitarian considerations take precedence over appearance. Economy of space is generally of first importance with economy of cost a close second. Aesthetic satisfaction is often placed last, and such decoration as may be undertaken is frequently only in the nature of carrying out the motif of the whole in the details of the unit.

Economy of cost calls for minimum area of road surface, minimum length of enclosure, and the least possible waste of space. Economy of space is insisted upon, aside from its tendency to reduce cost, in order to utilize as much as possible of the property for more interesting purposes.

Service courts may be grouped into three general classes: (*a*) those adjacent to the service part of the residence and used mainly for the delivery of supplies, which might be called kitchen courts; (*b*) those adjacent to the garage used principally for turning cars about on entering or leaving the garage, which might be called garage courts; and (*c*) those so located as to combine the functions of both kitchen and garage courts, for which no better name suggests itself than general service courts.

Within each of these classes there are three types of service courts, as defined by the method of performing the turn. The first type is the simple loop around which vehicles pass in a continual, progressive movement. The second type includes all courts of such size or shape that vehicles cannot move about the court in a progressive direction, but must back one or more times. For want of a more euphonious name which is equally descriptive these will be called "backing" courts, and the type subdivided according to the number of times a vehicle must go backwards in order to negotiate the turn. The third type is again a combination of the two preceding types.

The loop is the most satisfactory and simple form of turnaround of the three. Its sole disadvantage is that it requires more space than a "backing" court. Except for this matter of space it would be the only type necessary. If the center of the loop is left open, either as pavement or as unobstructed turf, it serves both as a loop for ordinary cars or for trucks within the size for which it was designed, and also as a backing court for trucks of unusually large size.

The shape of a loop has been discussed in Part IV in connection with the designing of forecourts. The simple loop (that is, one without provision for stopping places) is sufficient for ordinary service purposes, for there is seldom any necessity for bringing the vehicle close to a step or curb. If the occasion arises for stopping parallel to and close against a curb or step, it may be done by backing, without frequently inconveniencing anyone.

Size is determined largely by the use of the service court, whether it is intended for a limited class of automobiles or trucks, or for general use by large and small vehicles, and whether for occasional cars or for heavy, continuous and fairly rapid traffic. A service court for a factory, a public garage or a farm would probably be much larger than one for a private estate. The owner's passenger automobiles and merchants' delivery trucks comprise the great majority of vehicles using a private service court and it is the characteristics of these vehicles which govern its size. Merchants' delivery trucks are generally of light weight, of fairly short wheelbase, and of good turning ability. Pleasure vehicles using the service court are apt to be of all sizes, and provision should be made for the largest kinds in order to accommodate guests' cars if not the owner's. The general dimensions of delivery trucks and passenger vehicles are quite similar, as may be seen by this table:

	Light Delivery Trucks		Passenger Automobiles	
	Minimum	Maximum	Minimum	Maximum
Turning radii	18′ 0″	25′ 0″	15′ 0″	29′ 6″
Wheelbase	8′ 1″	11′ 1½″	8′ 3″	12′ 3½″
Length	12′ 9″	17′ 1″	11′ 2½″	18′ 4″
Width	5′ 4″	5′ 8″	5 ′ 4″	6 0″

Service loops, therefore, should be designed to handle vehicles having turning radii of from 25 ft. 6 ins. to 30 ft. Very heavy trucks have much greater turning radii, some being reported in excess of 50 ft., but these trucks are so seldom encountered that their occasional use of the court need not be considered, provided open space is allowed for them to back around. Backing turns involve a totally new problem, due to the mechanical construction of automobiles. As previously explained, the center of a circle described by an automobile is on the line of the rear axle extended. Consider what effect this has on the backing of a car.

When a car is being backed around within a restricted area the driver turns his wheels before putting the car in motion. The front wheels being set at a fixed angle the car then describes the arc of a circle. When a car which is moving forward is swung into a turn, however, it describes a curve similar to a parabola until the maximum angle of the front wheels is reached. Bearing these factors in mind the development of the accompanying diagrams is easily understood.

Fig. 1 shows the path of a car which turns by backing once, the backward motion being taken after the car has been brought to a stop without change from its original direction of travel. The arrows are marked F for forward and B for backward motion. The letters X and Y indicate respectively the minimum radii of the outside front wheel and of the inside rear wheel, and W indicates the wheelbase. It will be noted that the width of the space required to turn the car is theoretically the length of X.

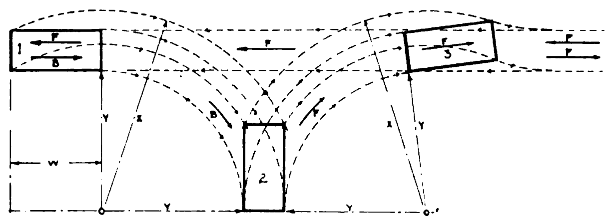


Fig. 1

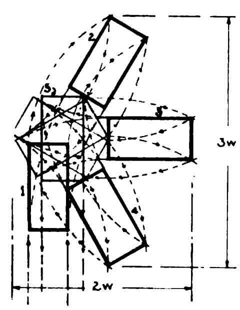


Fig. 3

Compare this turn with Fig. 2 which shows the path of an automobile which swings off the direction of original travel for its first movement and then backs around. In this case the width of the space required for turning is much greater, being equivalent to X plus W plus slight correction due to the parabolic shape of the entering curve.

These two diagrams show the nature of the backward movement of a car. It has often been said that a car can back in a smaller circle than it can negotiate in a forward direction. The fallacy of this is obvious, yet the two diagrams show the probable origin of the notion. The truth is that a car can be turned with less backing in a narrow road if it makes its first movement across the road *backward* (as in Fig. 1), than it can if it swings across the road forward and then backs around (as in Fig. 2).

The shape of backing turns is governed by (*a*) the direction from which the backing is commenced, and (*b*) by the number of backing movements made. A car may back once, twice, three times or often more; and the space needed for each turn is less for the greater number of backings. Fig. 3 shows the shape and size of the space covered by an automobile turning by backing thrice. The actual path of the car is shown by the dotted lines, and the consecutive numbers indicate the various forward positions which the car may reasonably be expected to occupy.

The third type of backing turn is a combination of the other two, and is generally encountered when a loop is used directly in front of a garage. This type is shown in Fig. 4.

Solutions to all turning problems may be found by varying these types of turns or by combining them to meet the specific conditions in mind. A few examples may be helpful.

The suburban garage in a restricted area sometimes is on a shallow lot which requires the least possible length of drive and backing space. In this case Fig. 2 gives the proper shape of turn, the owner being obliged to turn and back into his garage. On the other hand a narrow deep lot may require the use of the type shown in Fig. 1, in which case the car is always run directly into the garage and turned when it is backed out. By such economies and restrictions turns can be provided in surprisingly small and otherwise unused areas that occur in the layout of a plot.

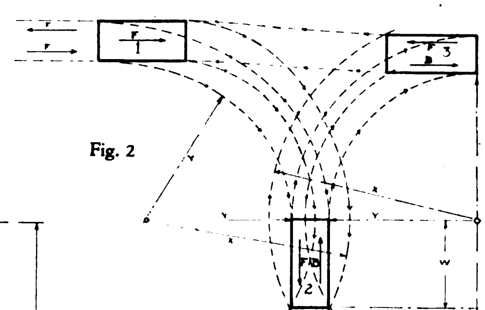


Fig. 2

When the approach to the garage is parallel to the front of the garage several variations of the problem may be possible. If the driveway is far enough away from the entrance to the garage, a turn similar to Fig. 5 may be used. Slight economies in length or width may be effected by distinguishing between the manner of making the turn, as shown in Figs. 1 and 2. When the drive is close to the garage entrance the car must always be backed once on both entering and leaving as shown in Fig. 6. The road may also approach the garage from the rear, parallel to one side of the building, when a shape similar to that shown in Fig. 7 is suggested.

When a large garage accommodating a number of cars is considered, the problem is not altered in principle. It is necessary to plot the path of each car in order to determine the shape of the drive. Occasionally the varying sizes of the cars occupying the garage may be used to advantage. An electric runabout or a small car may be placed in the stall requiring the sharpest turning, while the larger cars are given stalls where their greater turning radii are allowed more room.

Kitchen courts are best served by loops or by simple backing turns. Garage courts are either backing turns or combination turns. General service courts are best served by a combination turn or otherwise by a backing turn. Care in designing garage turns is advised in order that space be allowed to clear the garage doors before a sharp turn is made, unless it is possible to establish the width of the doors so that cramped quarters will not mar the success of the design. Projecting doors require additional width of turning space.

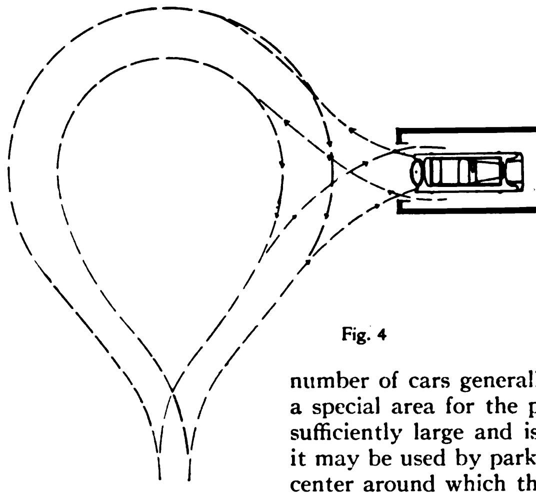


Fig. 4

Parking space for guests' cars or for the owner's cars when out of the garage is a very valuable and convenient detail which is too seldom considered. The usual approach to an estate quickly becomes congested if one or more cars are left standing in the roadway, making passage for other vehicles difficult. Some space should always be provided for the use of standing automobiles, if it is nothing more than a piece of lawn adjacent to the driveway. Such use of good turf is extravagant in maintenance costs and could well be avoided by the inclusion of an appropriate area for this special purpose in the original design of the driveway system.

One reason for the necessity of such parking space is the owner's desire to keep a car near his front door for personal use at any time. This may be provided by liberally widening the driveway immediately in front of the door or by providing an extra width of pavement elsewhere within the forecourt. The demand for this convenience is so nearly universal that it may almost be stated as a requirement in forecourt design. A width of 15 ft. in the pavement opposite the doorway is generally the minimum and care should be exercised to see that it is possible to drive into this parking space without backing and also that the space is long enough to accommodate the car without blocking the rest of the roadway. This space will also provide for the occasional caller whose car could only be driven elsewhere at some inconvenience.

Parking space for a number of cars generally requires the provision of a special area for the purpose. If the forecourt is sufficiently large and is paved over its entire area it may be used by parking the cars in a row in the center around which the moving vehicles circulate as if the center were not paved. At a Massachusetts country club this principle has been elaborated by the designers. The entrance loop has been greatly enlarged and the center part planted with a high shrubbery border shaped like a horseshoe. The open end of the horseshoe is away from the clubhouse, towards the line of approach. Cars follow the drive to the door and, after depositing their passengers, continue half way around the turn to the opening in the hedge. Within the enclosure there is space sufficient for parking a large number of cars within very easy access of the clubhouse, but entirely screened from view. A footpath from the entrance of the house through the shrubbery makes it easy for a driver to rejoin his party or to get his car without a long walk.

Occasionally the service court is available for emergency use when numerous guests are to be accommodated. When near the residence this area is often entirely satisfactory for such use, and it may even be enlarged for the purpose.

If conditions do not warrant the use of either the forecourt or the service court for parking a special area must be provided, the size depending on the probable number of cars to be accommo-

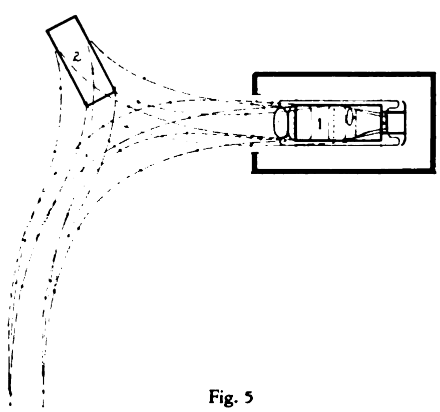


Fig. 5

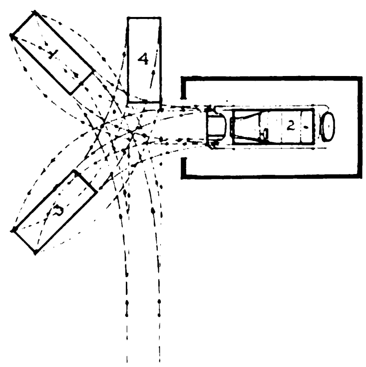


Fig. 6

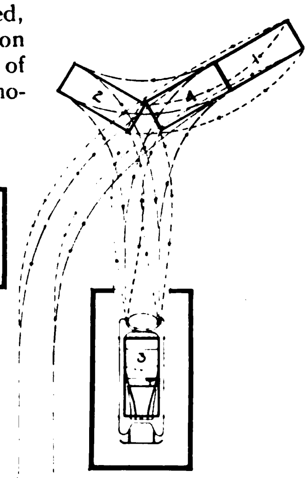


Fig. 7

dated. Large estates where frequent entertainments on a large scale are given need an area sufficient for 15 or more cars. Such space is conveniently constructed by widening a section of the roadway an extra 15 or 20 ft. for a short distance. Cars can be parked in this space diagonally to the edge of the road in the manner customary in many wide city streets. Often it is better to make a separate court for the parking of cars, entered by a branch from the main road. This scheme has certain æsthetic advantages over the abrupt widening of the roadway, as well as making it possible to keep the chauffeurs together in a place well screened from the eyes of the guests. Unless this parking space may be close to the owner's garage, in which the chauffeurs could be sheltered in severe weather, a small heated building provided with toilets would be very desirable to complete the scheme.

No problem more often confronts the designer than that of properly locating the garage. Of recent years the garage has been admitted to the sanctum sanctorum, becoming an integral part of the house itself. No other location is so convenient to the owner who drives his own car, and frequently no other arrangement is so economical in cost and in the ease with which the garage is heated during winter weather. It is generally located in the basement of the residence or beneath a porch or terrace, when sloping ground offers the opportunity. Otherwise it crops out as a modern modification of the familiar carriage sheds which are often found joined to the fine old farmhouses of the country.

Garages beneath the house have certain disadvantages to be balanced with their qualities of convenience and economy. In the first place the location introduces a fire hazard which must be reduced to a minimum by safe construction. Then, too, it brings close to the living quarters the undesirable odors of raw and burning gasolene and oil, and the noise of starting motors, air compressors and mechanics' hammers. Perhaps the chief objection to placing a garage in this position is that this location makes necessary the use of land very close to the residence for the garage court, which results in occupying areas frequently more desirable for other uses. The low grade sometimes introduces drainage problems of material consequence.

When the garage is constructed as a wing or addition to the house it is less difficult to manage it properly and most of the objections just noted are lessened. For the owner-driver there is often no better solution to the garage problem on a small estate.

Detached garages are sometimes inconvenient for the owner-driver, and are more expensive to build and heat than either of the types which have been described. On the other hand, fire risks are reduced to a minimum and the annoyance of motor noises and odors is largely eliminated. The garage court is generally improved because more space may be given to it.

Difficulties of heating the detached garage are not so great now as formerly for numerous types of small heating units are now available. Heat may be economically conveyed from the plant in the residence for a considerable distance to the garage, or the arrangement may be reversed and the nuisance of a heating plant within the residence itself eliminated by combining the garage with a central heating plant. This is advantageous when greenhouses, servants' quarters, stables and other service buildings are grouped with the garage at a point some distance away.

Most private garages now are provided with underground gasolene storage tanks. The tank should be located outside the walls of the building, near the driveway so that supply trucks may reach the filling pipe without backing across a planted area. Gasolene will kill plants and even mature trees succumb in a few years to continued exposure to gasolene, due to leaking tanks or to drains from garages. This destructive effect of gasolene is seldom appreciated, yet it is so important as to warrant special precautions if fine trees are jeopardized by the location of a garage or filling station near them. Drains from the garage should be carried away from the trees as far as possible and tanks should be well underdrained to avoid saturation of the ground near the surface.

Turntables have not been mentioned in this discussion as means for handling cars in restricted areas but a word about them may not be amiss. They are seldom satisfactory for outdoor use for ice, snow and even dirt will put them out of commission. Their real usefulness is restricted to indoor areas, and generally to large public garages at that. Even here they are being supplanted by small caster-wheeled portable trucks.

This discussion of automobiles in their relation to private estates has been prepared more with the desire of calling attention to the problems introduced by this new and very popular vehicle than of solving these problems by infallible rules of design. It is our hope that more attention will be given to this subject by professional men so that eventually all designers will be equipped with principles and rules to guide them in the solution of problems presented by the constantly increasing use of the automobile.

Sprinkler Installation for Fire Protection

PART II—SPACING OF LINES AND HEADS

By W. D. BROWN, C.E.

FOLLOWING an examination of several forms of sprinklers in the previous article and some considerations of their use, there comes the important matter of the location of the sprinkler heads.

The distance from wall or partition to the nearest sprinkler should not exceed half the allowable distance between sprinklers in the same direction. Additional sprinklers may also be required in the narrow pocket formed by bay timber or beam and wall.

The inspection department sometimes permits blocking this space by boarding from the under side of the beam to the wall, or where no inflammable material is stored close to the ceiling and the construction is fire resisting, a sprinkler is usually waived by the authorities.

A line of sprinklers should be on each side of a partition; cutting holes through, or slatting a partition to allow sprinklers on one side thereof to distribute water to the other side, is not sufficient.

FOR MILL CONSTRUCTION—Under mill ceiling (smooth, solid plank and timber construction, 5- to 12-foot bays), one line of sprinklers should be placed at the center of each bay and the distance between the sprinklers on each line should not be more than:

8 feet on centers in 12-foot bays
9 feet on centers in 11-foot bays
10 feet on centers in 10-foot bays
11 feet on centers in 9-foot bays
12 feet on centers in 5- to 8-foot bays

Ceilings of modified mill construction having bays of less than 3 feet should be treated as open joist construction and sprinkler heads spaced accordingly.

Bay timbers spaced 3 feet or more on centers, but less than 5 feet on centers, will require special ruling. (See Figs. 3 and 4.)

FOR JOIST CONSTRUCTION—Under open finish joist construction, the lines should be run at right angles to the joists and the sprinklers "staggered" on adjacent lines. Have the distance between sprinklers not exceeding 8 feet at right angles to the joists or 10 feet parallel with joists, the end heads on alternate lines being not more than 2 feet from wall or partition. (See Fig. 2.)

AN EXCEPTION—An exception may be made to this rule *if the conditions warrant*, viz.: *special permission* may be given to install but one line of sprinklers in bays 10 to 11½ feet wide on centers. In all cases where such bays are over 11½ feet wide, two or more lines of sprinklers should be installed in *each bay* as required by the rules for spacing. This does not apply where beams are flush with the joists, in which case sprinklers may be spaced as called for in "joist construction." Where this permission is given, the sprinklers should be placed closer together on a line so that in no case will the area covered by a single sprinkler exceed 80 square feet.

FOR SMOOTH FINISH AND FOR SHEATHED OR PLASTERED CEILINGS—Under smooth finish, sheathed or plastered ceilings, in bays 6 to 12 feet wide (measurement to be taken on centers of any drop beams forming the bay), one line of sprinklers should be placed at the center of each bay, and the distance between the sprinklers on each line should not exceed: 8 feet in 12-foot bays; 9 feet in 11-foot bays; 10 feet in 6- to 10-foot bays. Bays in

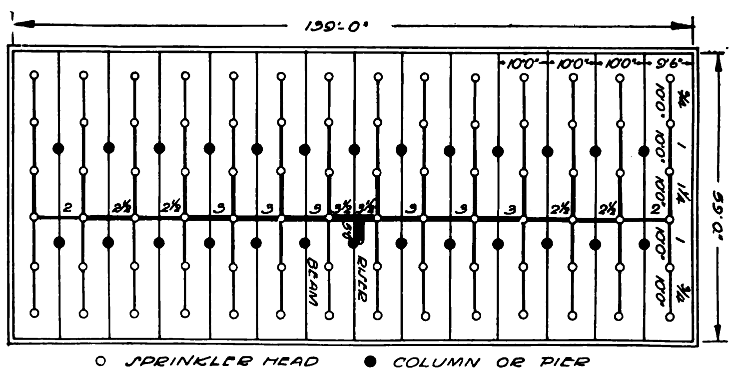


Fig. 1. Sprinklers Located under Mill Construction

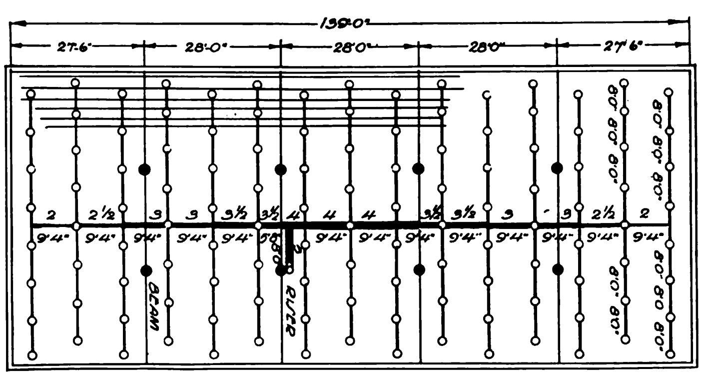


Fig. 2. Sprinklers under Joist Construction. Heavy Lines are Feed Mains and Light Lines are Branch Lines or "Stringers"

excess of 12 feet and less than 23 feet in width should contain at least two lines of sprinklers; bays 23 feet in width or over should have the lines therein not over 10 feet apart. In bays in excess of 12 feet in width not more than 100 square feet of ceiling area should be covered by any one sprinkler.

In no case should a sprinkler spacing exceed 10 feet on center at right angles to direction of joist.

For Pitched Roofs—Under pitched roofs sloping more than 1 foot in 3, sprinklers should be located in peak of roof, on either side of peak and spaced according to requirements just given. Distances between sprinklers should be measured on a line parallel with rafters. Where the roof meets the floor line, sprinklers should be placed not over 3½ feet from the intersection. Sprinklers not more than 2½ feet distant each way from the peak of roof, measured on a line with the roof, may be used in lieu of sprinklers located in peak of roof.

For Fire-Resisting Construction—The rules for slow-burning construction should apply as far as practicable, however, the purpose being to arrange the spacing of sprinklers to protect the contents of a building, but in no case should a sprinkler on a line be more than 12 feet from the nearest adjoining head.

For Unusual Construction—Special instructions should be obtained from the inspection department having jurisdiction relative to the location of sprinklers under floors and roofs of semi-mill, panel or other unusual forms of construction which may interfere with distribution of water. These types of construction are so varied that no absolute rules can be given to cover all cases.

"Semi-mill" is the term here applied to plank and timber construction with narrow bays generally less than 5 feet in width.

"Panel" construction is where the ceiling is divided by the timbers into panels or pockets. Narrow bay panels come under the head of "semi-mill" construction.

Sprinkler lines usually run at right angles to the timbers, with heads staggered under alternate timbers, in alternate bays, or alternately under the timbers and in the bays, the arrangement depending on the width of the bay, the size of the timbers and the distance between supporting girders, as well as upon the occupancy and water pressure.

Ordinarily, where the timbers are not larger than 6 x 10, the best distribution is obtained by placing the heads under the timbers.

The distance between lines will depend somewhat upon the distance between the girders supporting the timbers, the number of lines in these transverse bays being governed largely by the distance between the heads on the lines. Figs. 3 and 4 show spacing of automatic sprinklers under two types of semi-mill constructed buildings.

Pipe Size Schedule—In no case should the number of sprinklers on a given size pipe on one floor of one fire section be more than

¾ inch pipe	1 sprinkler
1 " "	2 sprinklers
1¼ " "	3 "
1½ " "	5 "
2 " "	10 "
2½ " "	20 "
3 " "	36 "
3½ " "	55 "
4 " "	80 "
5 " "	140 "
6 " "	200 "

Where cross mains supply branch lines of only two sprinklers each, the conditions approach those of long single lines. Such feeds should usually be centrally supplied where there are over eight or ten branch lines. Lines up to fourteen in number may be fed from end, provided that 2½-inch pipe does not supply more than sixteen sprinklers.

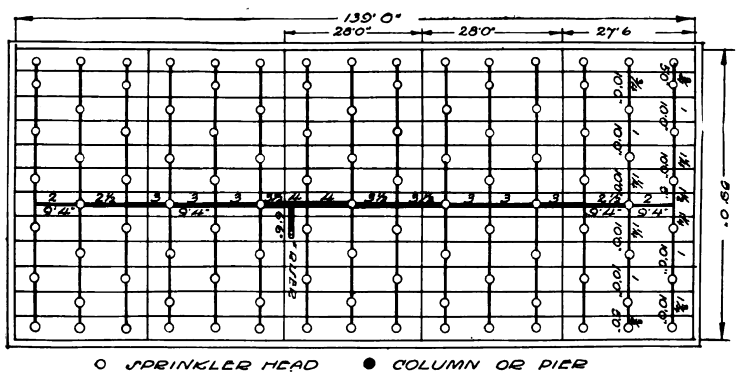


Fig. 3. Sprinklers under Semi-Mill Construction in Alternate Bays

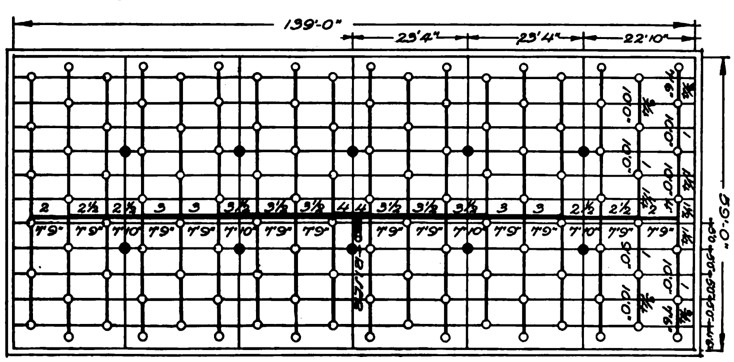
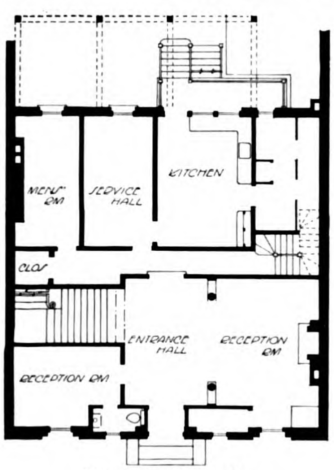


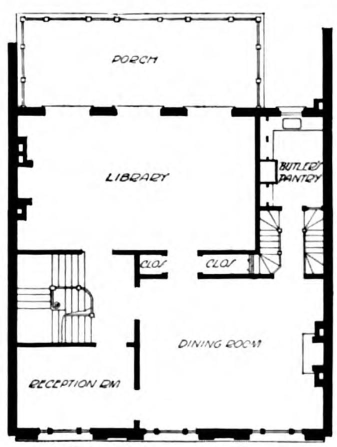
Fig. 4. Sprinklers Located in Semi-Mill Construction under Alternate Timbers. Riser Indicates Vertical Supply to Mains

House of Mrs. Theodosia Pleadwell, Washington, D. C.

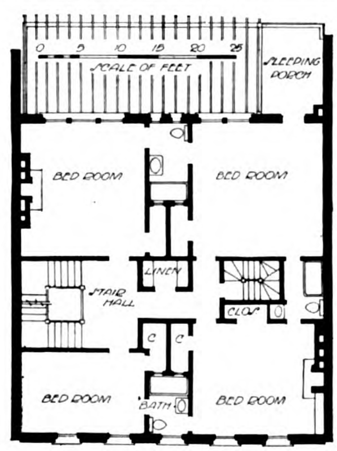
CLARKE WAGGAMAN, ARCHITECT



FIRST FLOOR PLAN



SECOND FLOOR PLAN



THIRD FLOOR PLAN

EDITORIAL COMMENT

ARCHITECTS AND ENGINEERS

THE relation of the architectural and engineering professions whose work lies along similar lines and often overlaps is a subject of interest that comes up in various sections of the country quite frequently. With the increasing amount of legislation affecting the registration of architects and also of engineers, there are occasional efforts made to obtain an agreement on conditions and request joint registration acts. On the whole there is no special advantage to either profession in joint registration, but getting together to discuss its possibilities has a definite advantage in that it enables the professions to acquire more intelligent and comprehensive ideas of their respective obligations to the public.

If the two professions stand apart and carry through programs with entire independence of each other it is but natural that misconceptions should arise. Last spring there was a good deal of criticism by engineers of the appointment of a firm of architects to design a Pittsburgh bridge, and two engineering societies, the American Institute of Consulting Engineers and American Society of Civil Engineers, passed resolutions condemning the employment of architects except in an advisory capacity on bridge design. At a joint meeting of the A. I. A. Committee on Engineering Co-operation and a Committee of Engineering Council, there was full opportunity to present the necessity of architectural design in such important civic structures as bridges, and the result was a report which recognized the fundamental importance of both engineering and architecture in bridge design and stated that it was an administrative detail of relative unimportance to determine which profession was given chief supervision.

Perhaps the most significant recent happening is the proposed State Federation of Engineers and Architects in Minnesota. On June 19 representative architects and engineers from the state met at Duluth and took the first steps toward forming a State Federation. They jointly realize that only by a combination of forces will either architects or engineers have sufficient power and weight of numbers behind them to force attention to matters of public concern having to do with engineering and architecture or with the regulation of affairs affecting the joint interest of these related professions.

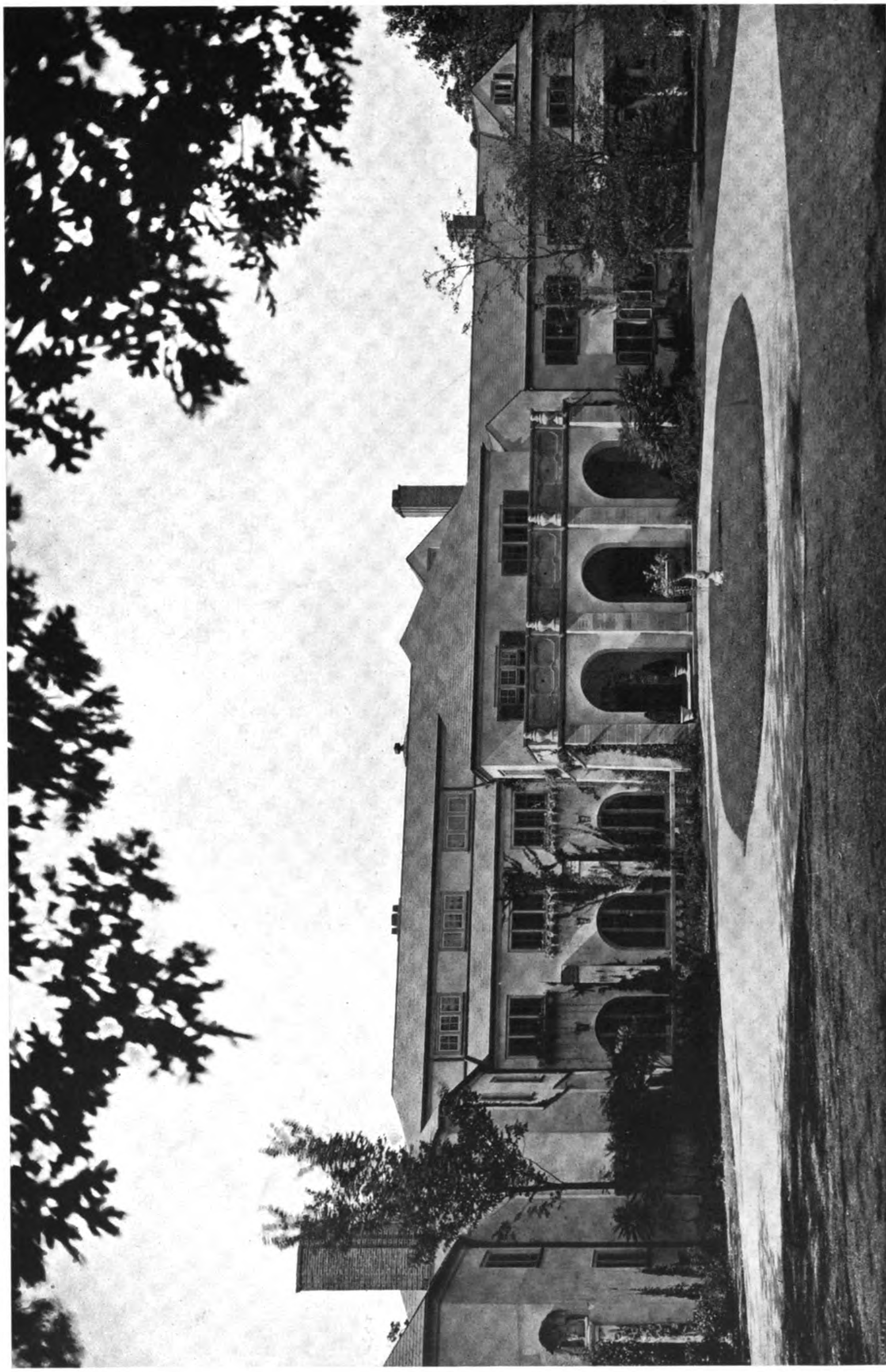
It is not the purpose of the Federation to supplant any existing organization, and this is borne out by the name of the proposed association. No one will be eligible to membership except through membership in his local organization. Thus in addition to promising a large body of intelligent and scientifically trained citizens who will exercise a beneficial effect on public opinion, it provides an added stimulus to the Minnesota Chapter of the Institute in increasing its membership as it does likewise to engineering societies. The separate organizations will retain all of their present independent character and are free to carry on such work locally as they may determine.

A committee comprised of the present Joint Engineering Board and one member from each of the societies represented at the meeting was delegated to draw up a constitution for the new organization. The method of determining how the board of directors shall be elected by the constituent societies has been wisely left to the consideration of the committee.

One of the immediate reasons for advocating the formation of this Federation is the movement for state licenses for architects and engineers in Minnesota. A meeting of the Joint Engineering Board was held just previous to the organization meeting of the Federation to discuss and adopt the form for a proposed license law that would include both architects and engineers. After a long discussion, the program was laid aside and it was agreed to have a committee appointed, consisting of three engineers and three architects, to draw up a bill, or bills, covering the licensing of architects and engineers, the choice of which was left entirely to the committee. The broad principles of the Federation are indicated by the fact that it recognizes the recommendation of the committee, equally divided as it is between the professions, will prove the most satisfactory solution, and it is ready to utilize its full power in backing up the request for licensing legislation whether in the form of one or two bills, when it is presented to the legislature this fall.

This character of co-operation is constructive and will result in good for both professions. It enables engineers to realize that architects are not putting forth a model for registration law that would prevent engineers from designing buildings. It brings to engineers some knowledge of the affinity of architecture to history and the cultural development of a people. Architects will learn, on the other hand, of the highly valuable inventive qualities of the engineer, the precision and utmost respect for accuracy which renders his service of such wide use to mankind. When these professions meet on a common ground of providing unselfish service to their fellow citizens, there will result only the greatest mutual respect.

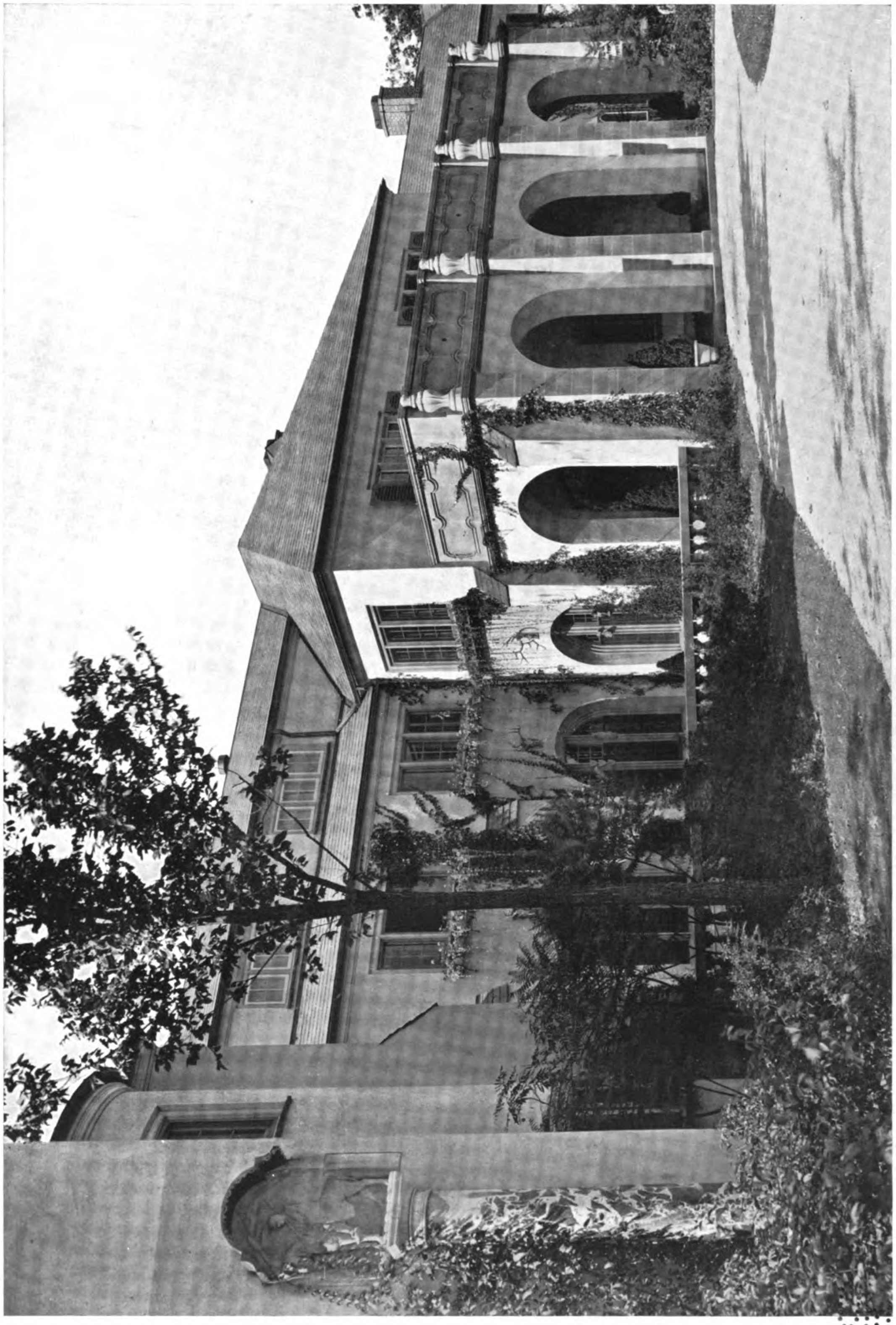
The fundamental requirements for architectural and engineering training differ to a considerable degree; the ways in which they approach their respective problems are different and it is difficult to adopt one set of regulations that would fairly determine the qualifications for practice of the respective professions. Separate registration laws will undoubtedly work to the best advantage of both, yet the two professions must combine their efforts frequently. This requires intelligent co-operation and every opportunity should be utilized to bring this about through the common ground of public service to which both should heartily subscribe.



VIEW OF ENTRANCE FRONT

HOUSE OF WILLIAM V. KELLEY, ESQ., LAKE FOREST, ILL.

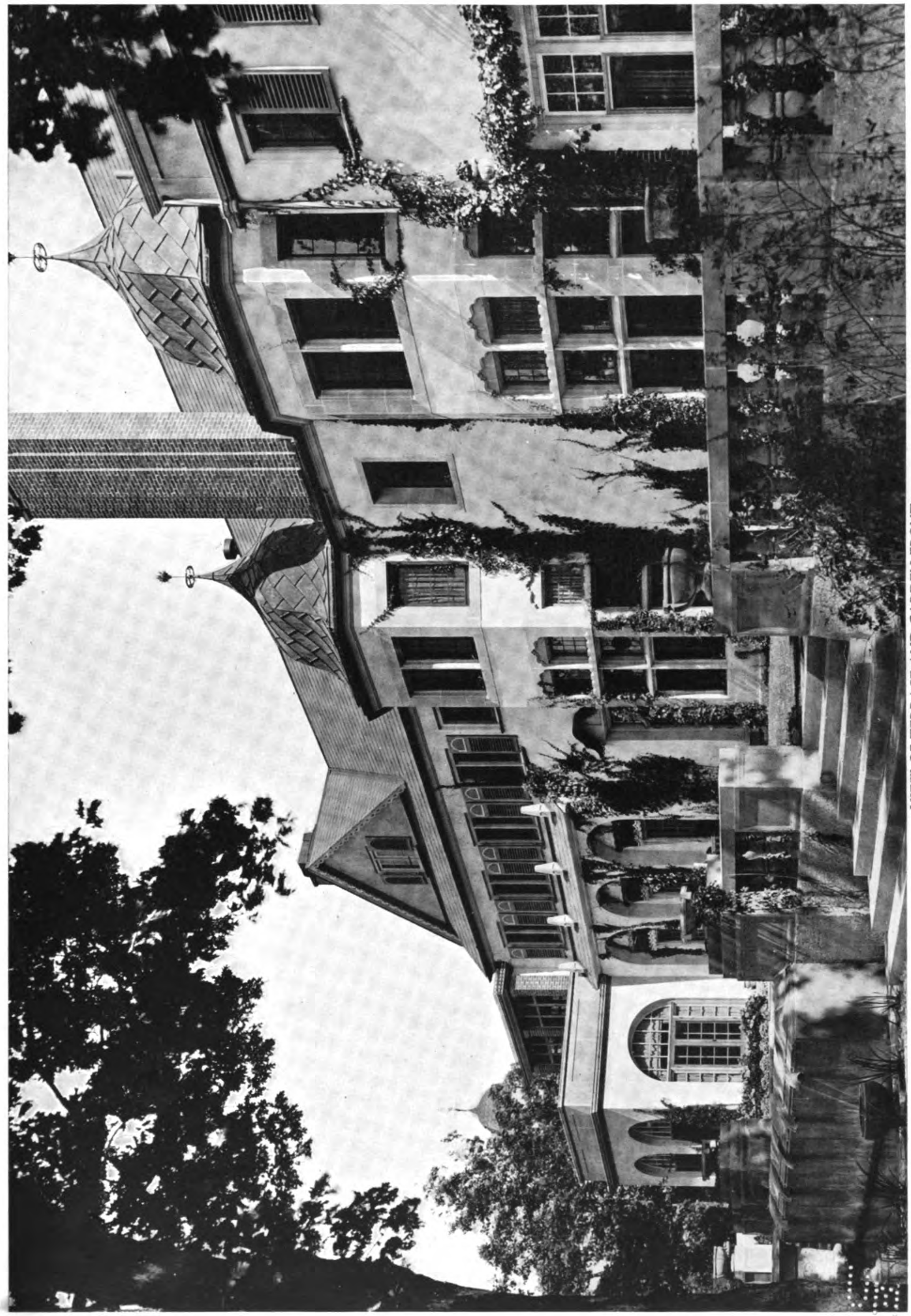
HOWARD SHAW, ARCHITECT



DETAIL OF ENTRANCE

HOUSE OF WILLIAM V. KELLEY, ESQ., LAKE FOREST, ILL.

HOWARD SHAW, ARCHITECT

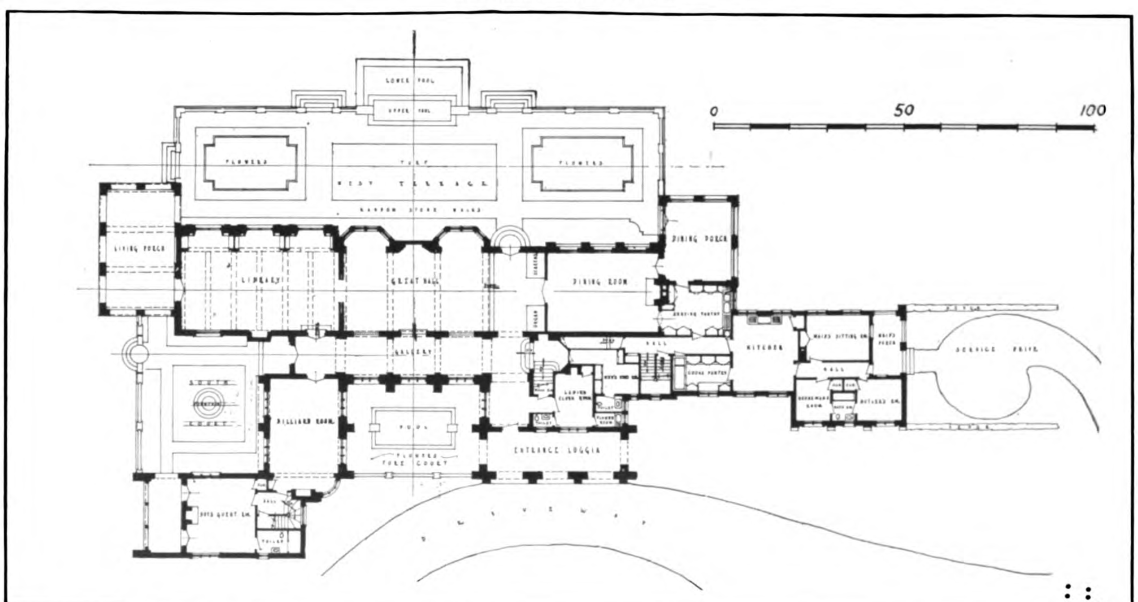


VIEW OF TERRACE AND GARDEN FRONT

HOUSE OF WILLIAM V. KELLEY, ESQ., LAKE FOREST, ILL.

HOWARD SHAW, ARCHITECT

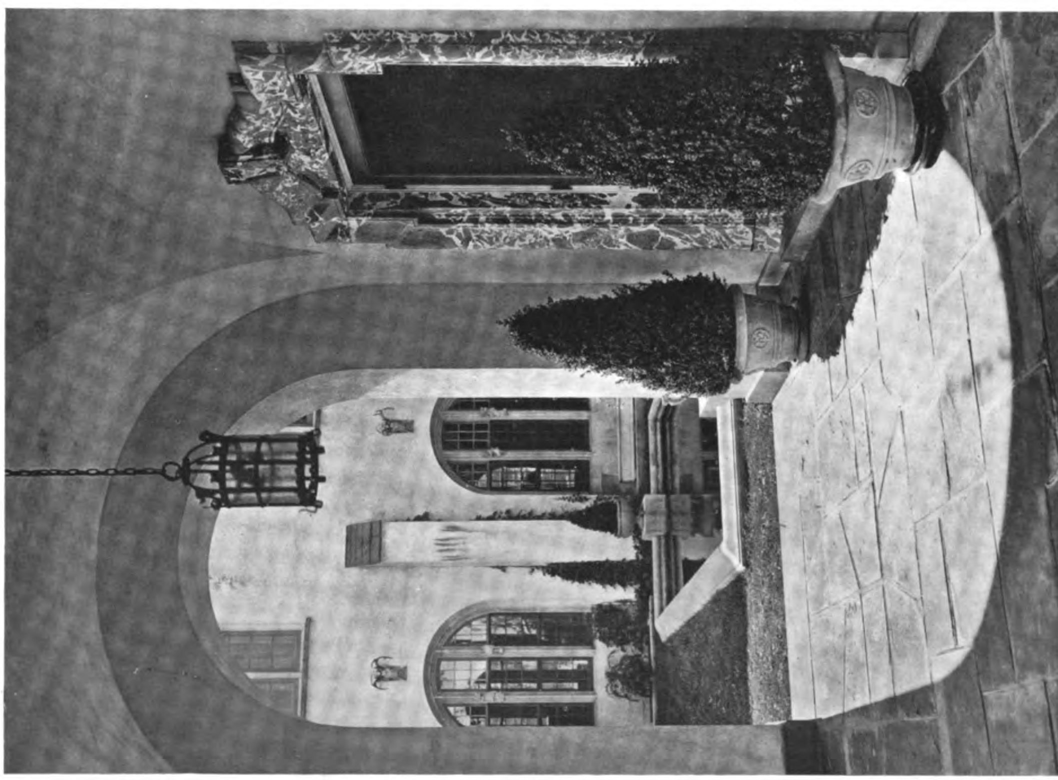
DETAIL OF SOUTH COURT



MAIN FLOOR PLAN

HOUSE OF WILLIAM V. KELLEY, ESQ., LAKE FOREST, ILL.

HOWARD SHAW, ARCHITECT



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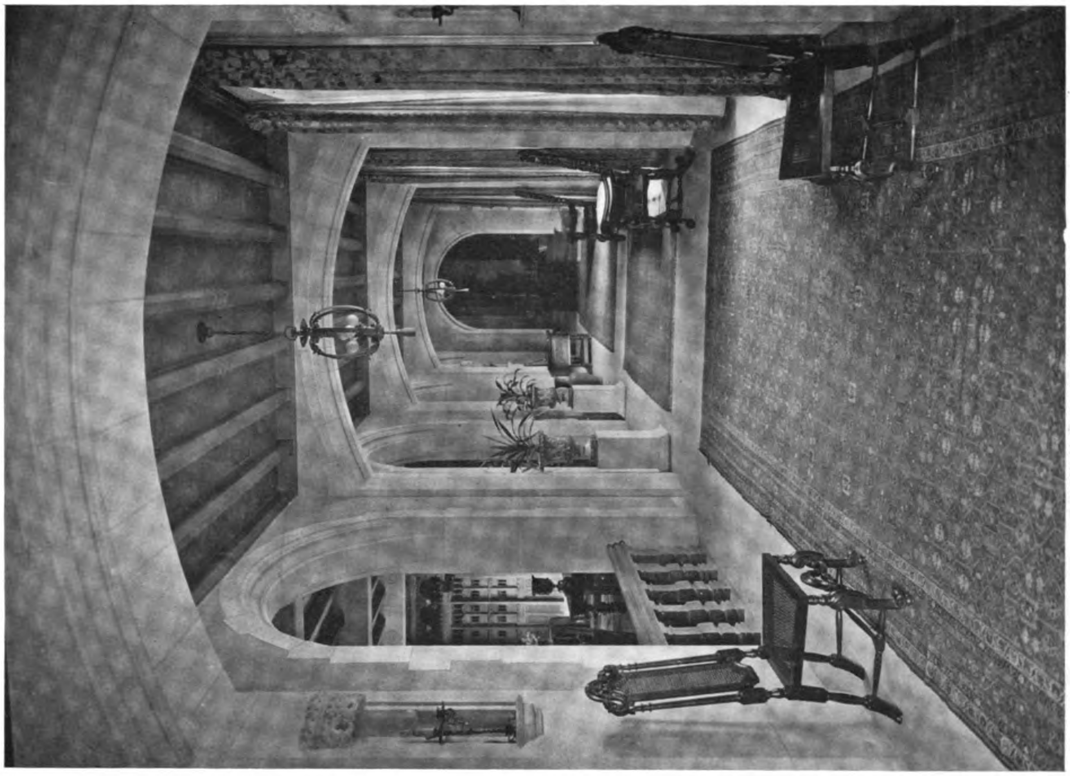
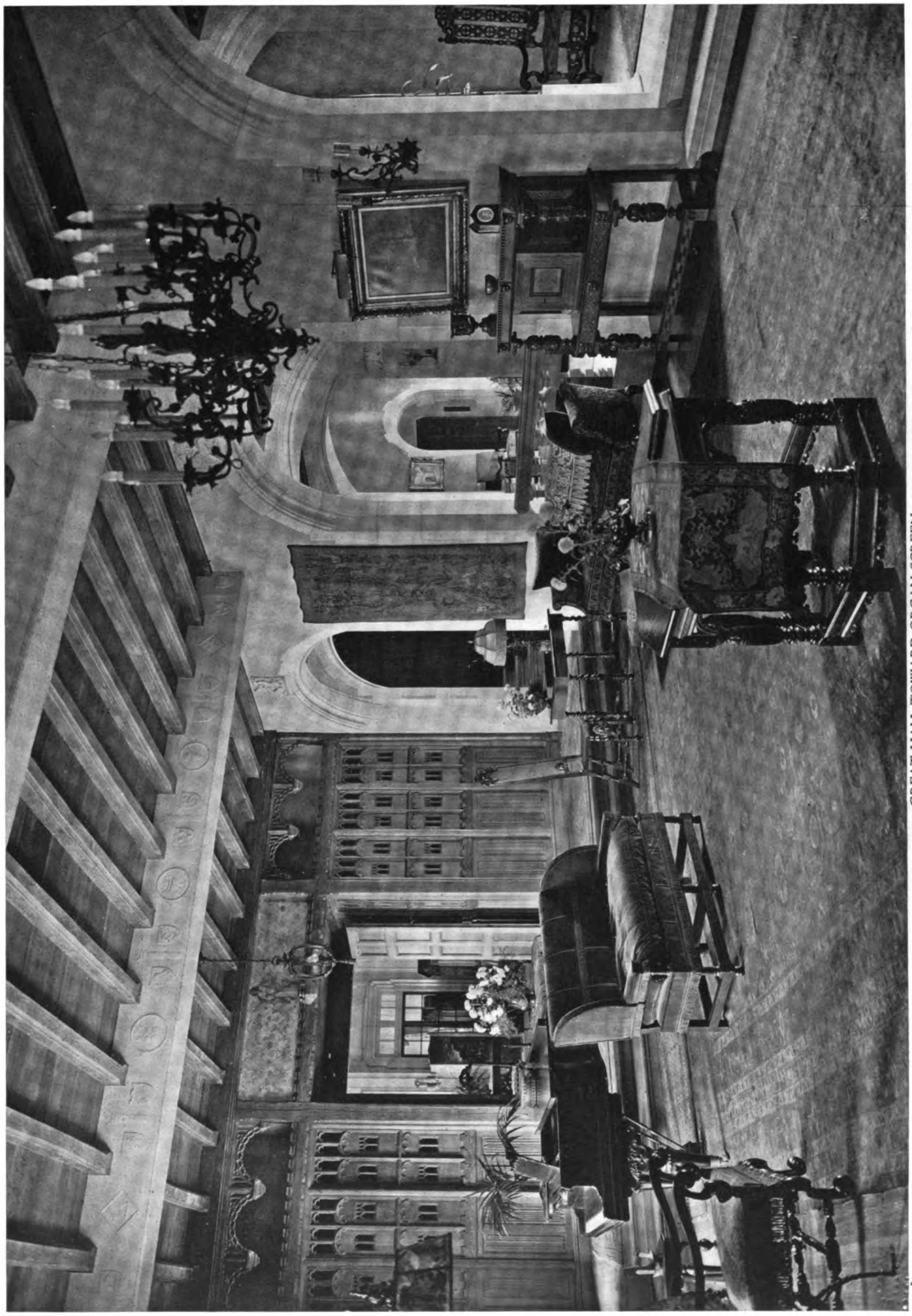


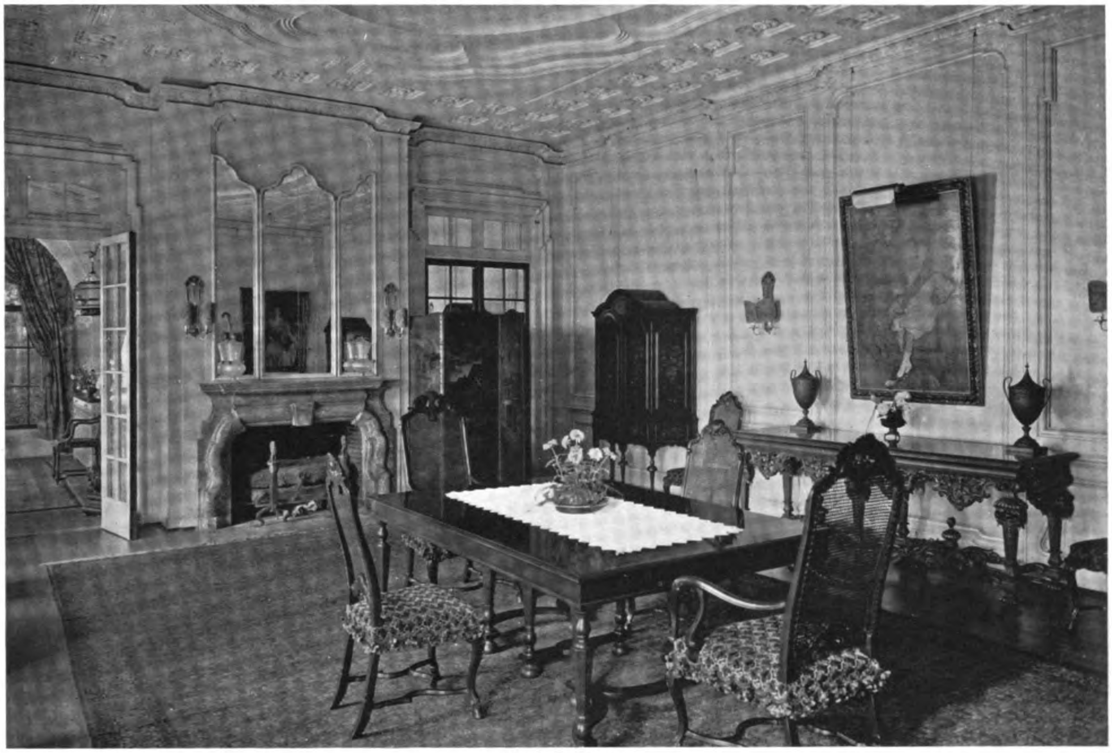
GALLERY TOWARD STAIRWAY

HOUSE OF WILLIAM V. KELLEY, ESQ., LAKE FOREST, ILL.

HOWARD SHAW, ARCHITECT



GREAT HALL TOWARD ORGAN SCREEN
HOUSE OF WILLIAM V. KELLEY, ESQ., LAKE FOREST, ILL.
HOWARD SHAW, ARCHITECT



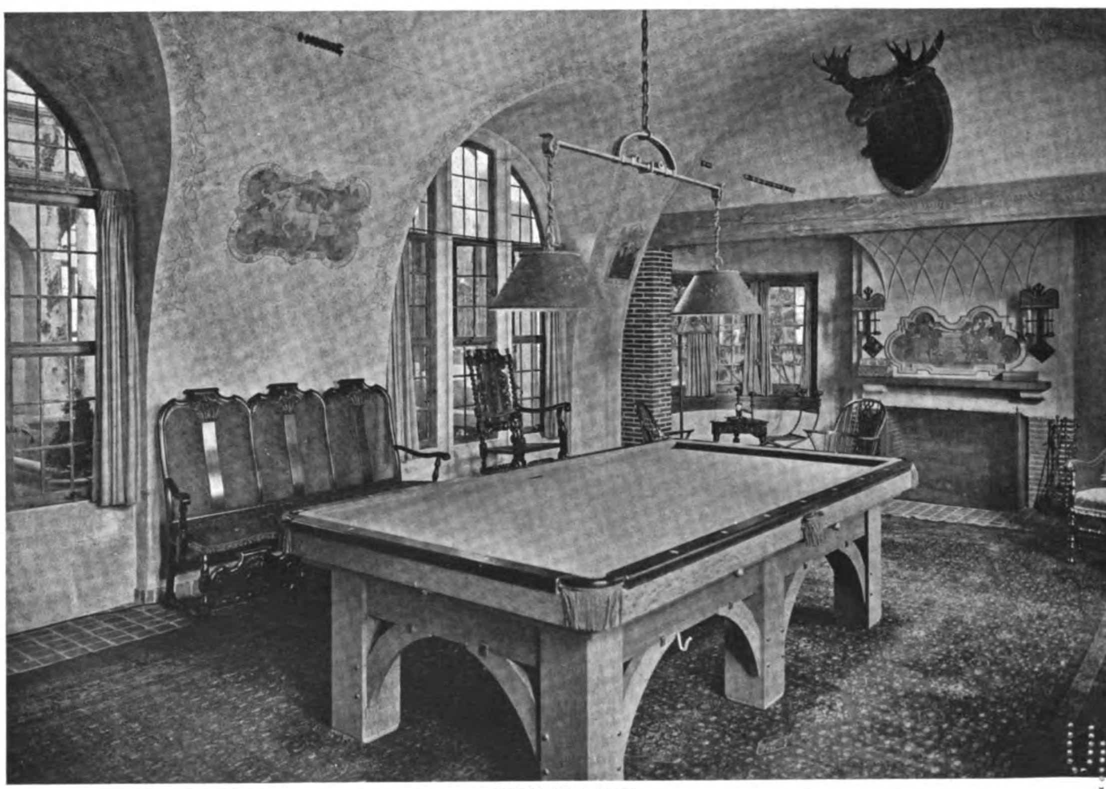
DINING ROOM

DINING PORCH

HOUSE OF WILLIAM V. KELLEY, ESQ., LAKE FOREST, ILL.

HOWARD SHAW, ARCHITECT

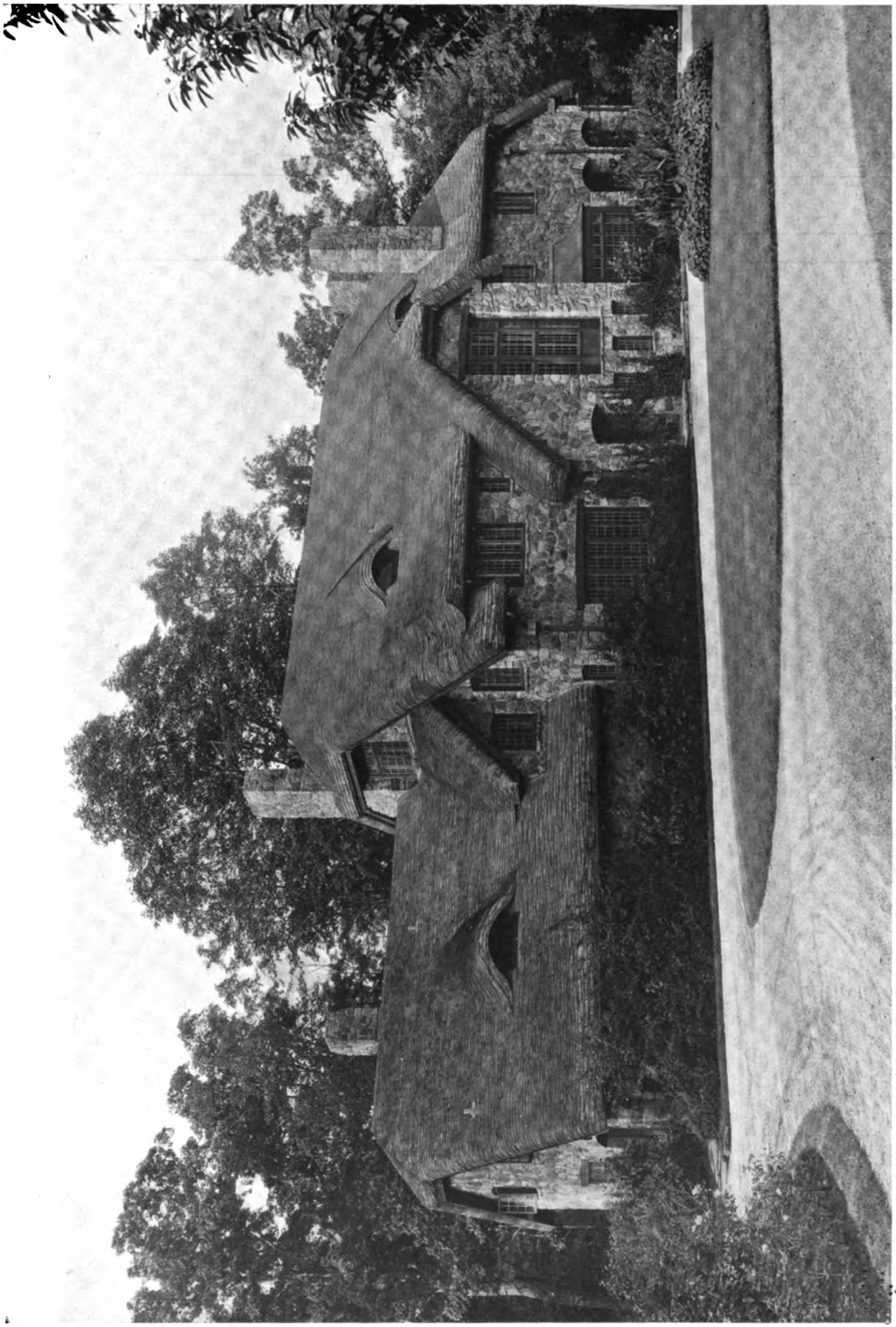
LIVING PORCH



BILLIARD ROOM

HOUSE OF WILLIAM V. KELLEY, ESQ., LAKE FOREST, ILL.

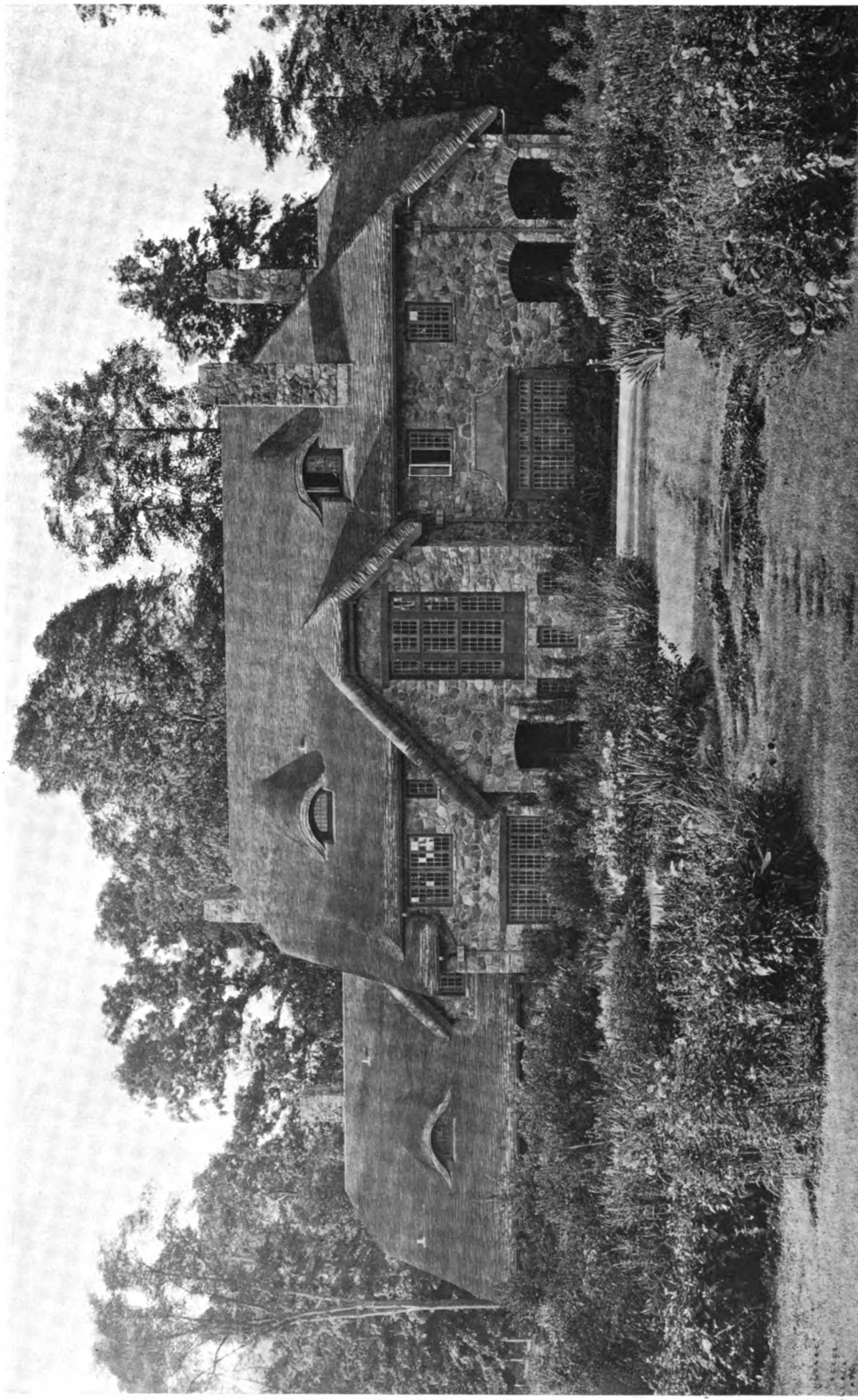
HOWARD SHAW, ARCHITECT



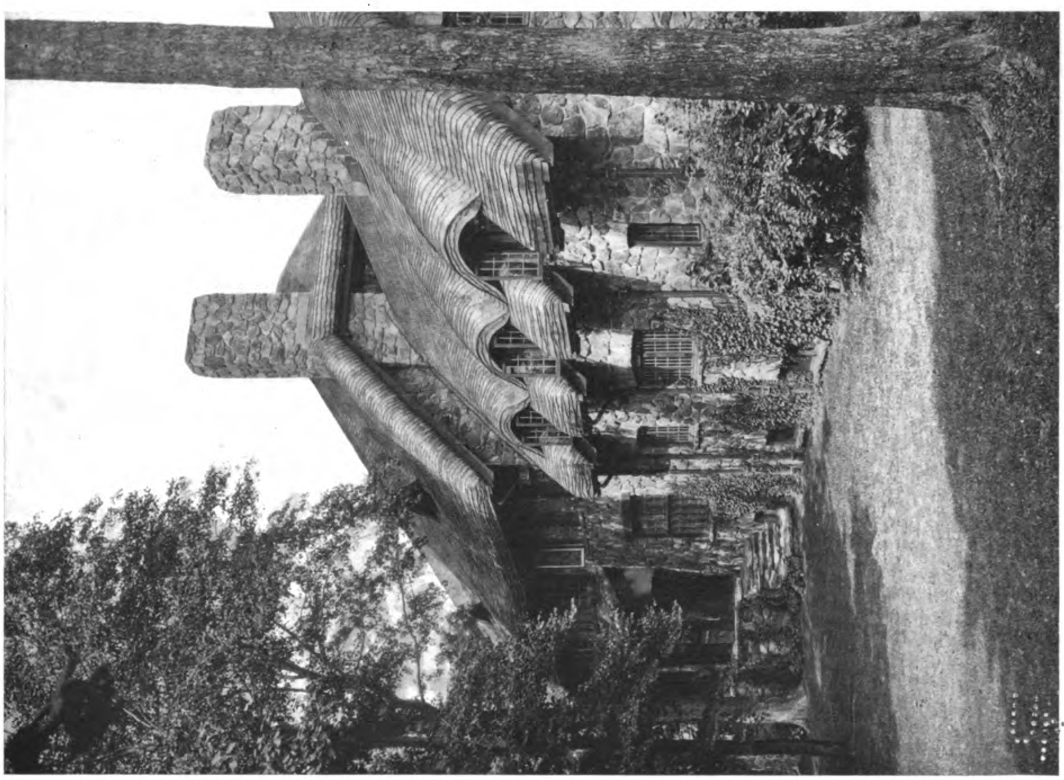
VIEW OF ENTRANCE FRONT

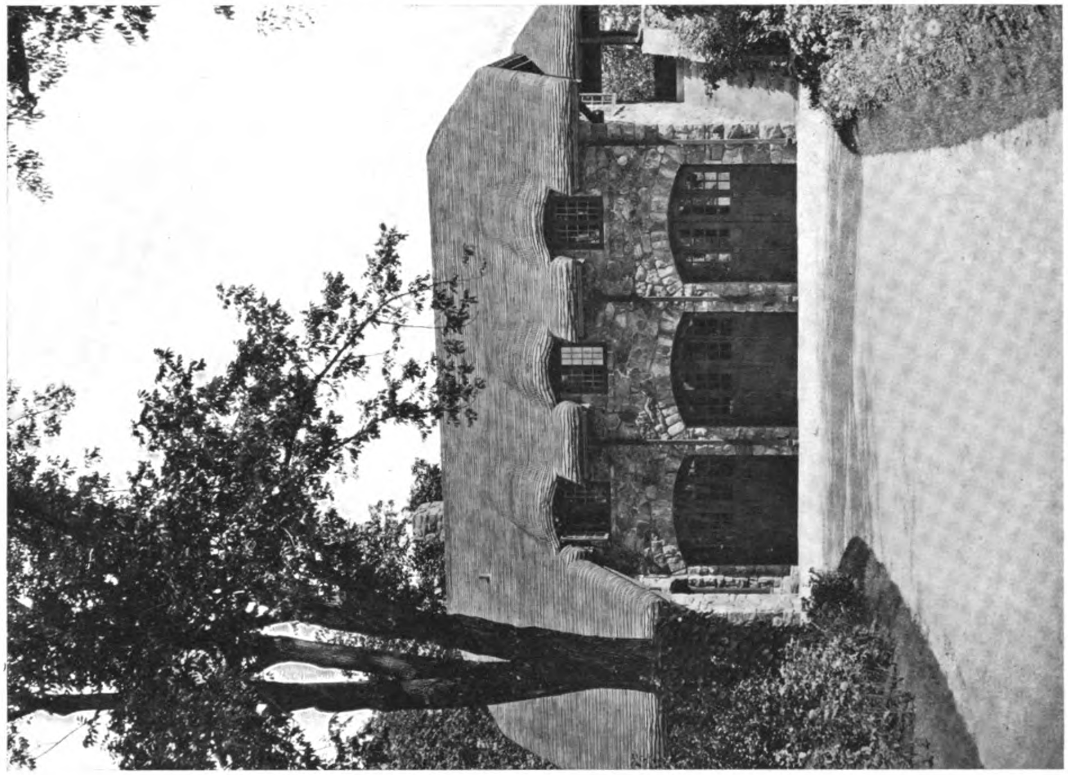
HOUSE OF MRS. H. J. DAVIS, SCARSDALE, N. Y.

W. STANWOOD PHILLIPS, ARCHITECT



VIEW OF GARDEN FRONT
HOUSE OF MRS. H. J. DAVIS, SCARSDALE, N. Y.
W. STANWOOD PHILLIPS, ARCHITECT

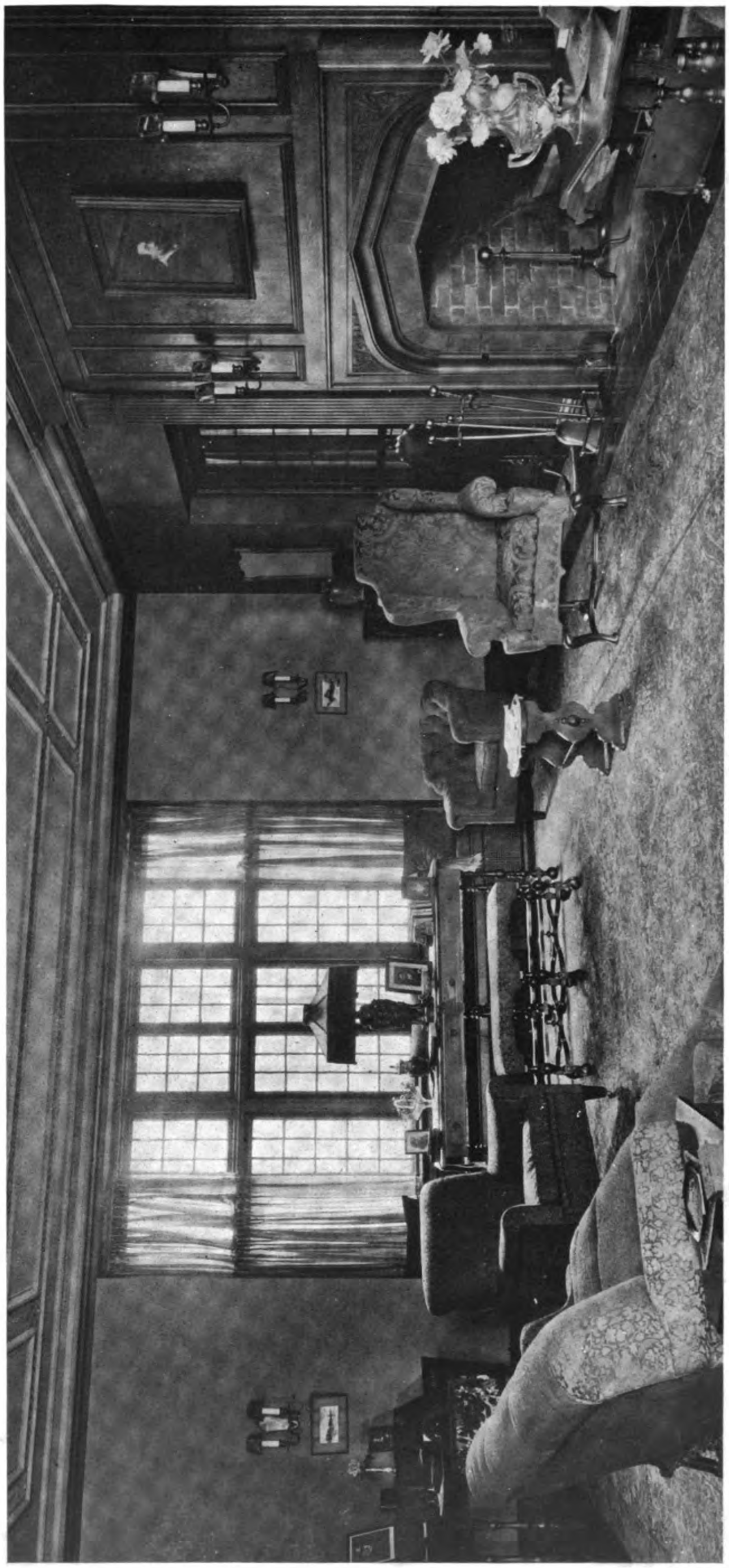




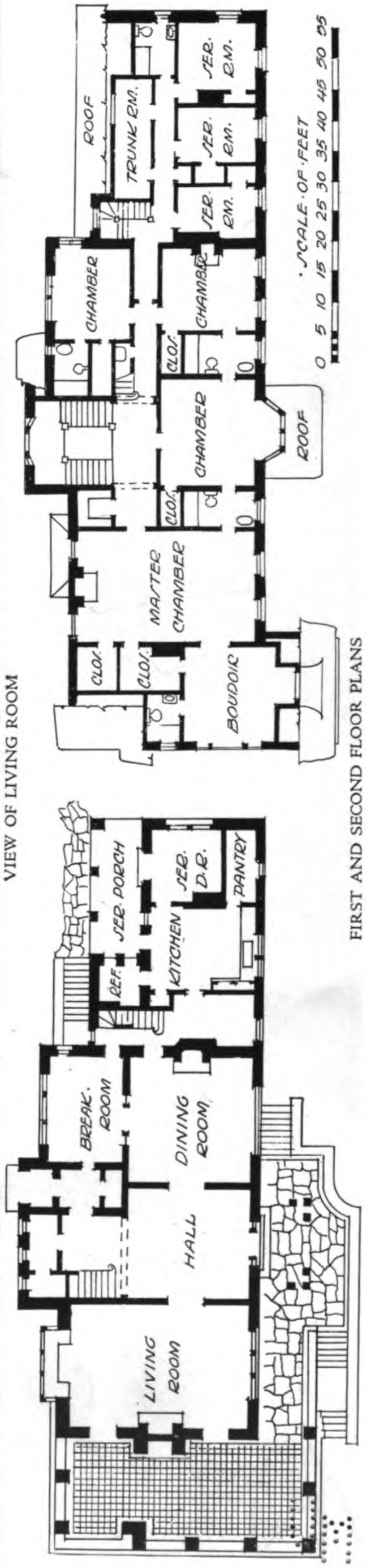
SERVICE WING AND GARAGE

HOUSE OF MRS. H. J. DAVIS, SCARSDALE, N. Y.

W. STANWOOD PHILLIPS, ARCHITECT



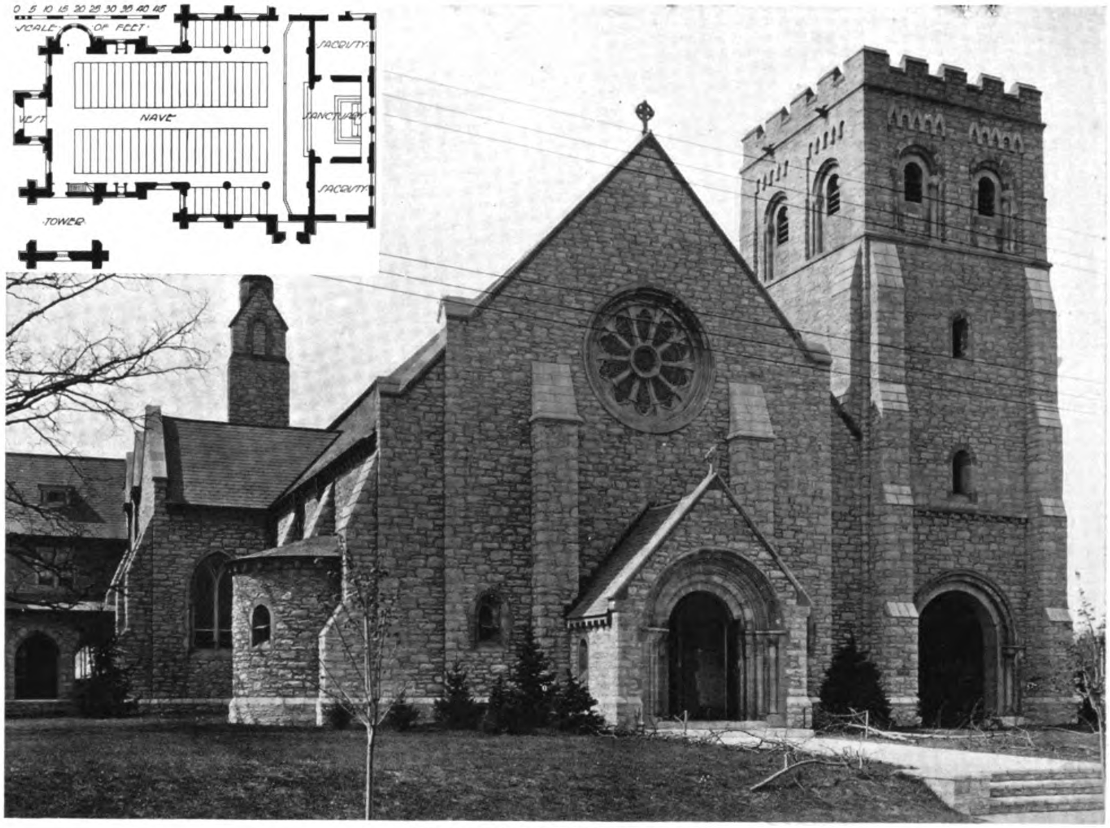
VIEW OF LIVING ROOM



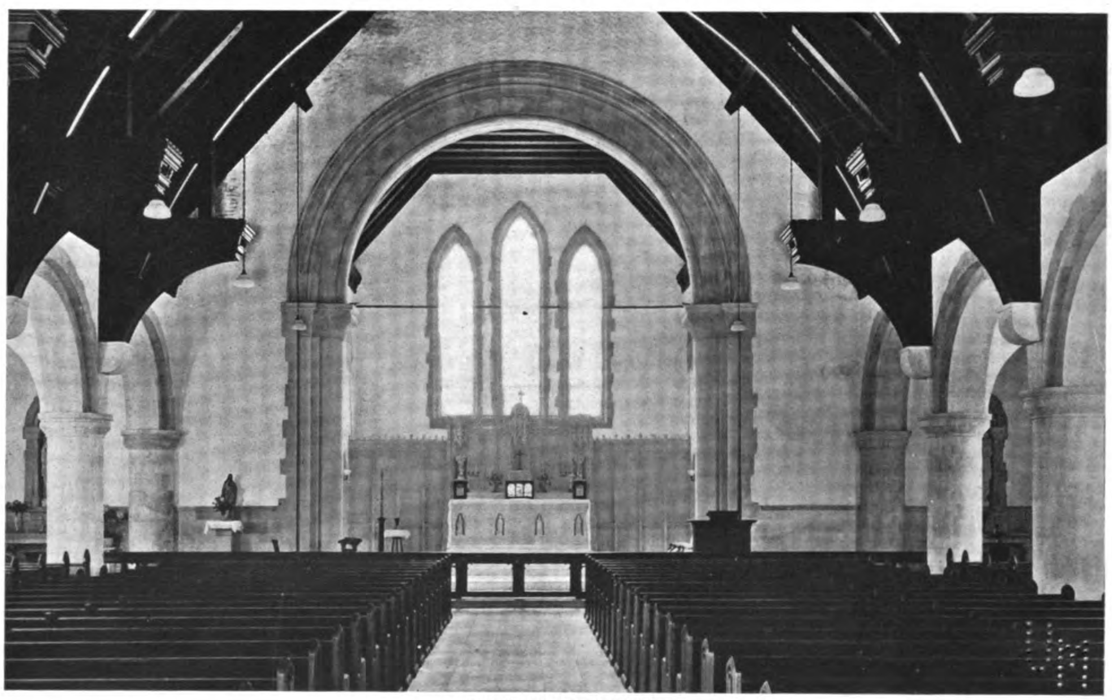
FIRST AND SECOND FLOOR PLANS

HOUSE OF MRS. H. J. DAVIS, SCARSDALE, N. Y.

W. STANWOOD PHILLIPS, ARCHITECT



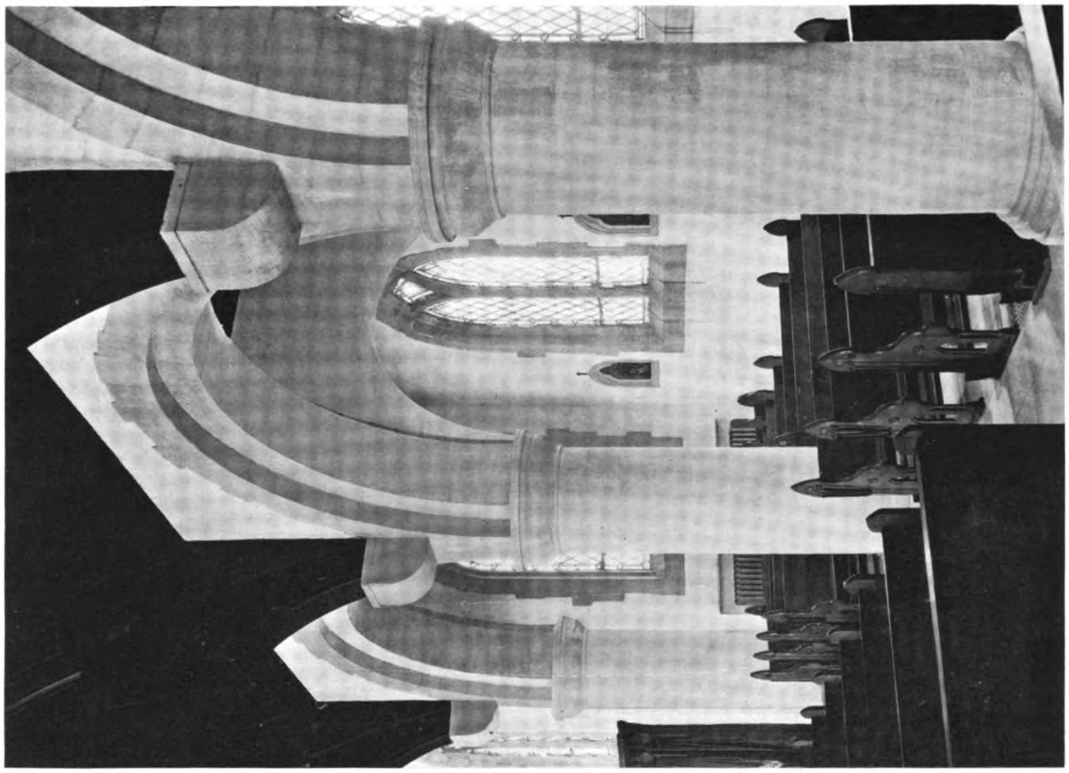
GENERAL VIEW AND FLOOR PLAN



NAVE AND SANCTUARY

CHURCH OF OUR LADY OF LOURDES, ST. LOUIS, MO.

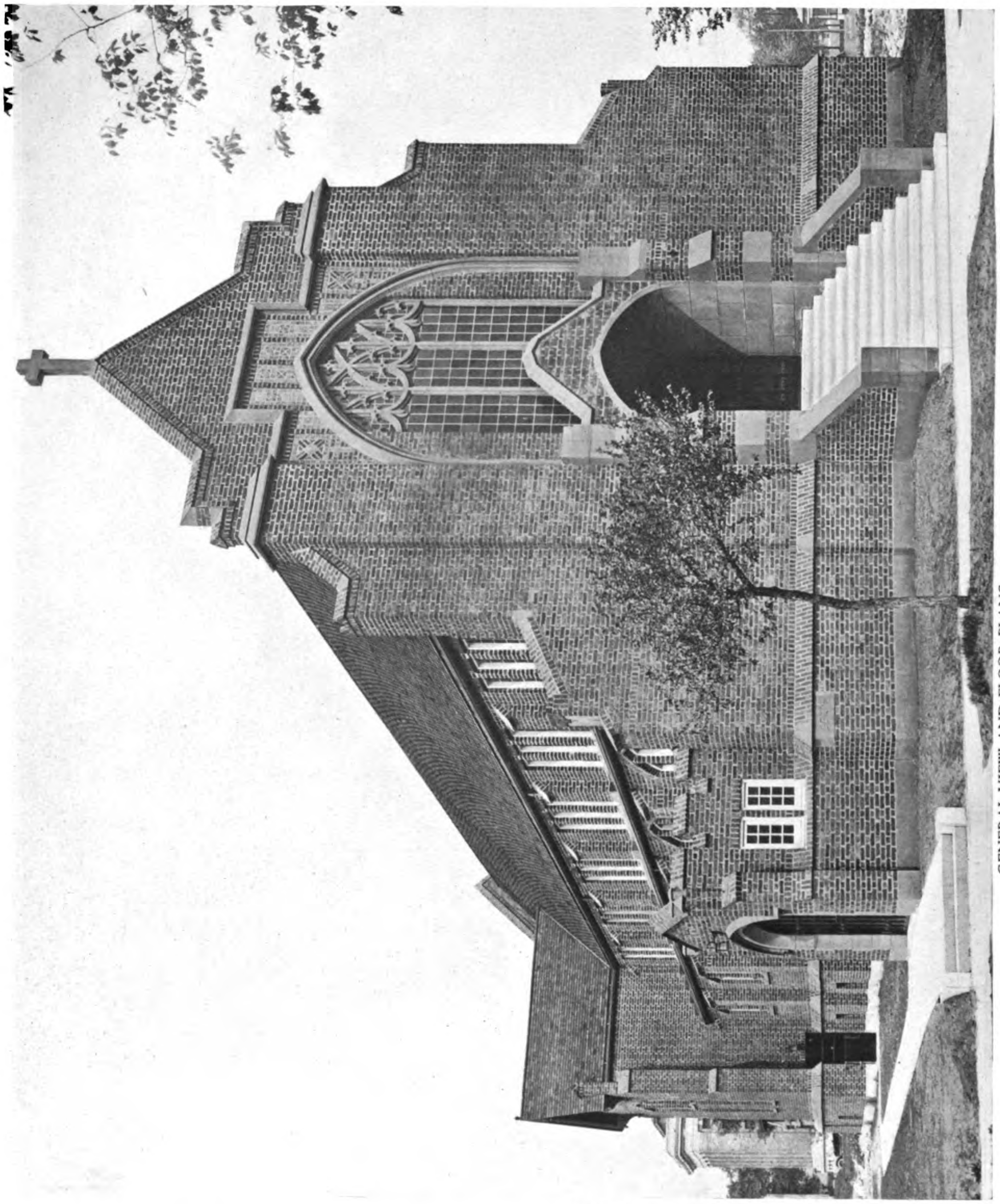
STUDY & FARRAR, ARCHITECTS



DETAILS OF ALTAR AND TRANSEPT

CHURCH OF OUR LADY OF LOURDES, ST. LOUIS, MO

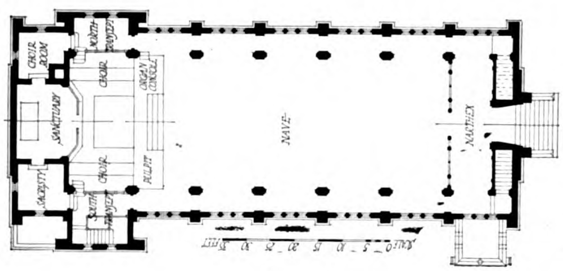
STUDY & FARRAR, ARCHITECTS

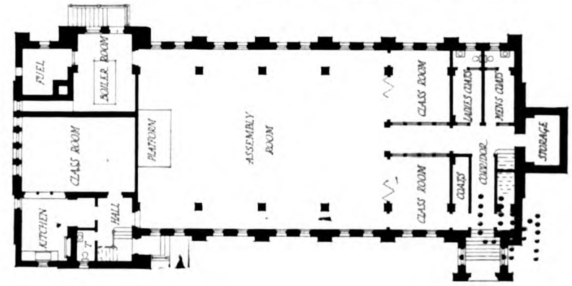


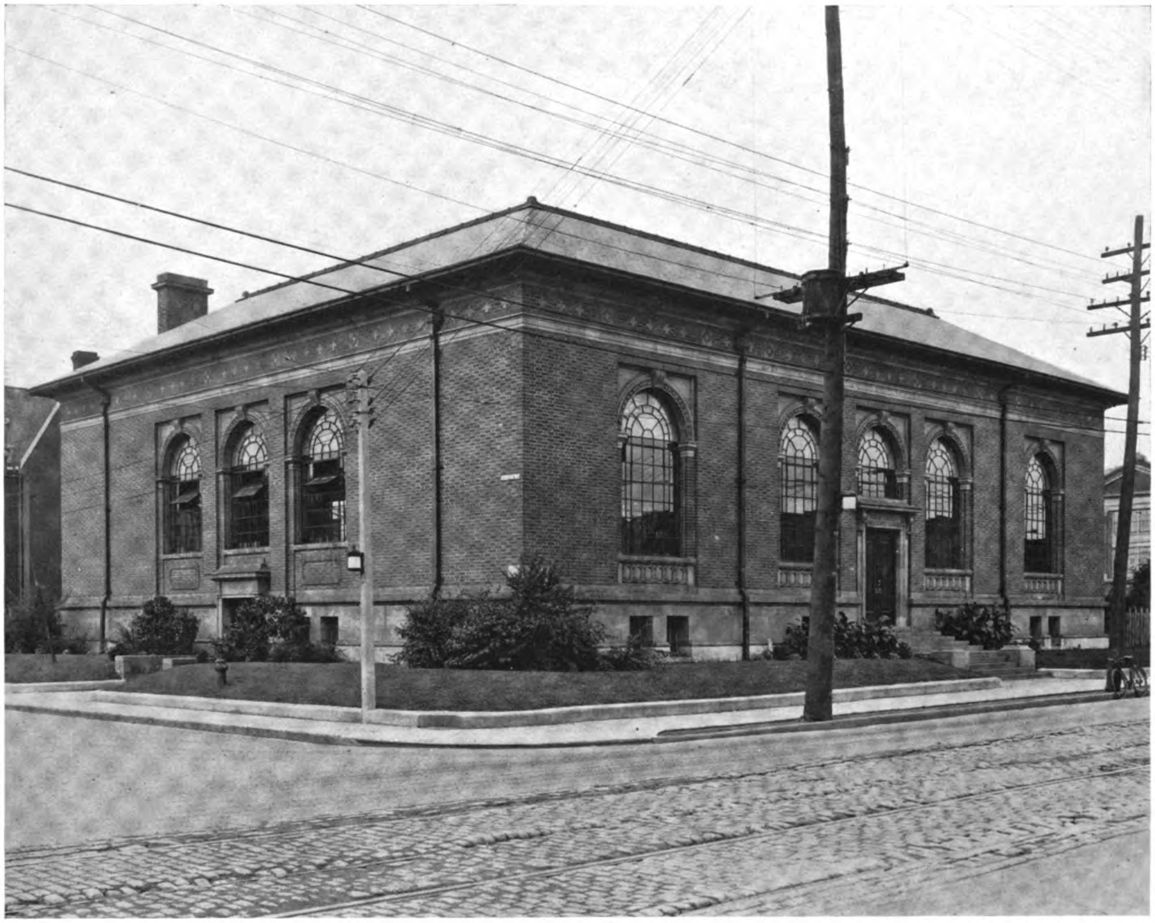
GENERAL VIEW AND FLOOR PLANS

GRACE EVANGELICAL LUTHERAN CHURCH, MINNEAPOLIS, MINN.

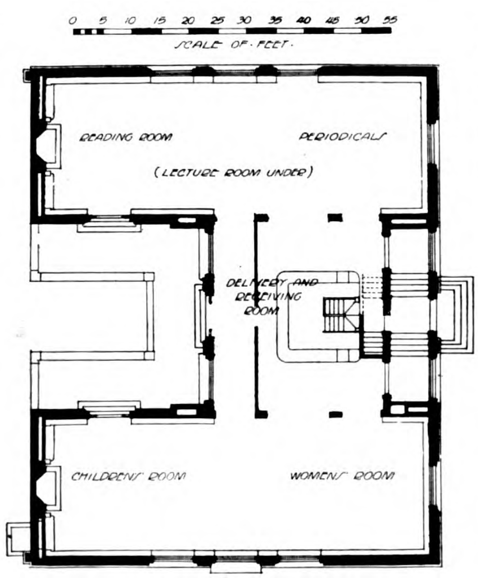
DESIGNED BY CECIL CHAPMAN, FORMERLY OF CHAPMAN & MAGNEY, ARCHITECTS

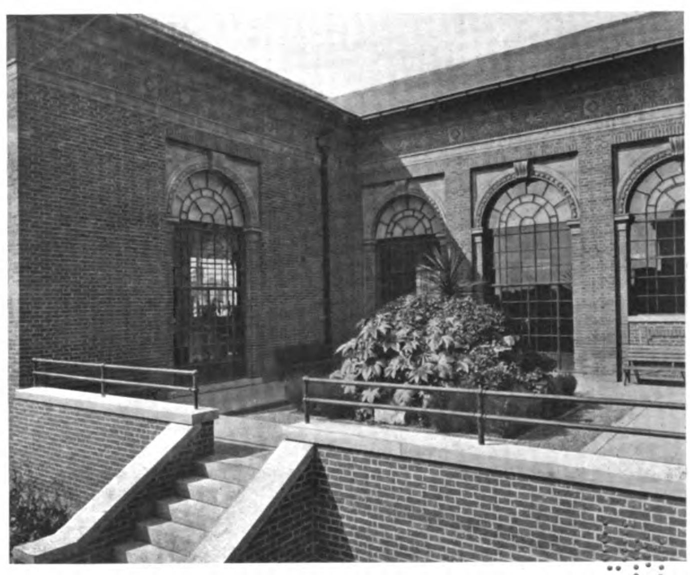






GENERAL VIEW





REAR COURT AND FLOOR PLAN

DOVERCOURT BRANCH LIBRARY, TORONTO, CANADA

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SEPTEMBER 1920

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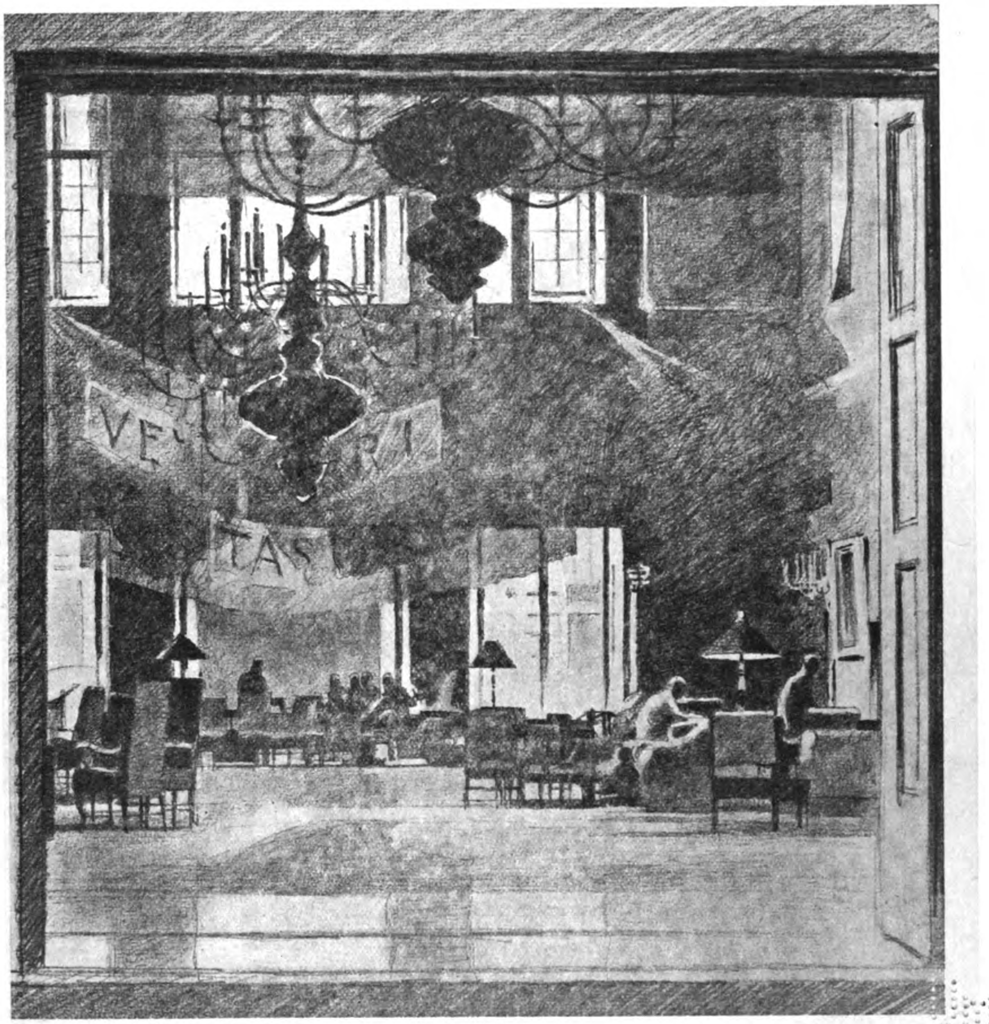


INTERIOR OF HARVARD HALL,
HARVARD CLUB, NEW YORK CITY

From Pencil Drawing by Harold R. Shurtleff

The ARCHITECTURAL FORUM

VOLUME XXXIII | SEPTEMBER 1920 | NUMBER 3

Interior Woodwork

GENERAL PRINCIPLES WHICH UNDERLIE DEVELOPMENT OF COLONIAL STYLE AND SUGGESTIONS FOR ITS PROPER MODERN USE

By RICHARD B. DERBY

INTERIOR finish in any house is good if it solves the modern problem against a traditional background. It is not good if it is merely modern, and it is not good if it is merely a reproduction of a given prototype. In the one case, though it may be alive, the form in which this life persists is likely to be ugly; in the other case, though the form may be correct in all particulars, life is lacking and the result is a dead thing. When, however, the inside finish is reminiscent of the past and at the same time unmistakably of the present it is almost certain to be both alive and good.

This generalization applies, we believe, to any work in any place, but our emphasis is to be placed on the colonial work native to this country. While this style is coming more and more into use and recognition, it is falling into a kind of disrepute because of its frequent bad handling. The very general use of the style has elevated certain of its characteristics into conspicuous notice. These characteristics are so marked that any casual attention paid to them fixes their general outline in the mind. The result is a wide use of the common characteristics of the style, with little or no attempt on the part of the users to refer these to their source and to become acquainted with them at first hand. Modern work, in reproduction, shows all the defects of this unintelligent procedure.

Most conspicuously abused, perhaps, is the early or Gothic work, so called. In this work we find an integrity of finish which has its roots firmly fixed in an integrity of structure. The frame is a substantial, solid and unified thing; every part of it is a work of art in itself and good to look at by itself, without help from wall covering, inside or outside. And much of the inside of it was not covered but was, indeed, the finish of the completed rooms. Corner posts, ceilings and considerable portions of the interior walls were both frame and finish, yet the essentially inter-dependent relation of the two is almost completely ignored in modern reproductions of this early style. We build our frame, conceal it and then apply a finish which attempts to simulate a structure. The result is a finish which deceives no one and is a merely effeminate brush painting of the masculine rough hewn original. Of course we usually lack the means, today, to build economically in the old way in all its strong integrity; but why debase the style by pasteboard imitations?

Similarly, though not so conspicuously, with the later colonial styles. The broad treatment of the early work is not more refined and effeminized than the refined and delicate treatment of late work is coarsened and vulgarized. The most frequent offenses are found in the size and proportion of openings and in the treatment of fireplace motives. Hardly a new house but has an open plan,— every room visible from every other room, through doorways, frequently doorless, as wide as they are high, sometimes with columns added to support the architrave. Mantels with overmantels abound, both embraced by huge and heavy pilasters. Woodwork generally is used with little or no thought of its proper relation to wall surfaces or of what, indeed, it does in any room. There seems to be a tendency to put as much finish in as the client will pay for, with little thought of appropriateness or character.

The periods too, in the essential meaning of the word, are much confused in modern work. There is little or no value, of course, in period work for its own sake, but underlying the several marked changes through which colonial work has passed are many more fundamental things than dates. Openings, size and position, story height, scale and character of detail, are some of the elements of character which give significance to period divisioning. In sum, we center our attention too much on minor details and depend on these final touches to give our houses a colonial look. And a colonial look is all that many of them have.

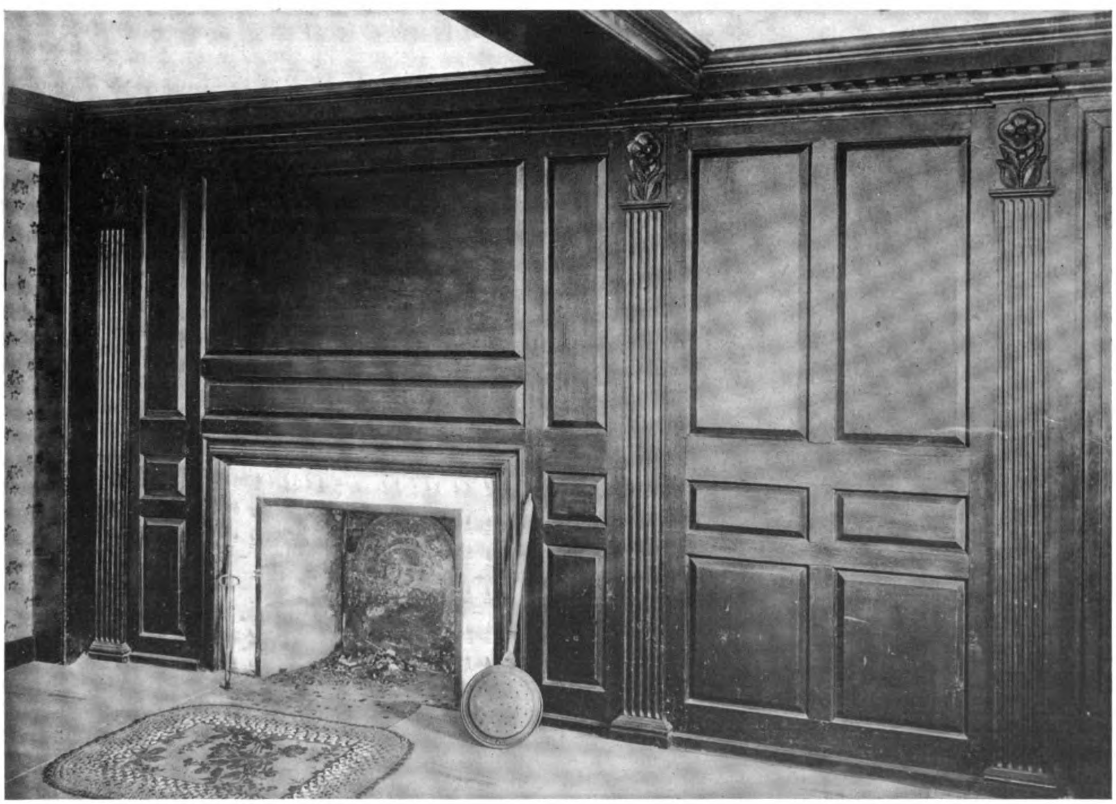
This is not an argument for imitation and reproduction, for adherence to period, or for strictly literal following of any part of the style whatever. It is rather a plea for a study of the style as a whole with a view to building up a background of sufficient scope and correctness to enable designers to use it freely without debasing it. It is not to be hoped or even desired that a literal knowledge of the periods and examples will stick long in the minds of many people, but a thoroughgoing study of these things will leave the memory clear as to the general line of development and will give a sense of character. One will be able to look at a good example of some given type of door or window and know whether it is late or early and the really important thing, what the character of the related detail should properly be.

A certain stigma undoubtedly attaches and should attach to the mere copyist. But this stigma should not attach to those who are merely giving the full value to tradition. There are too many factors at work in the design of a house to permit anybody to believe that the result of their working together can ever be a product true to type. Effort should be made to prove not that an architect has reproduced a given model in a particular piece of work, but rather why he has been able to achieve his good result by way of adapting his models.

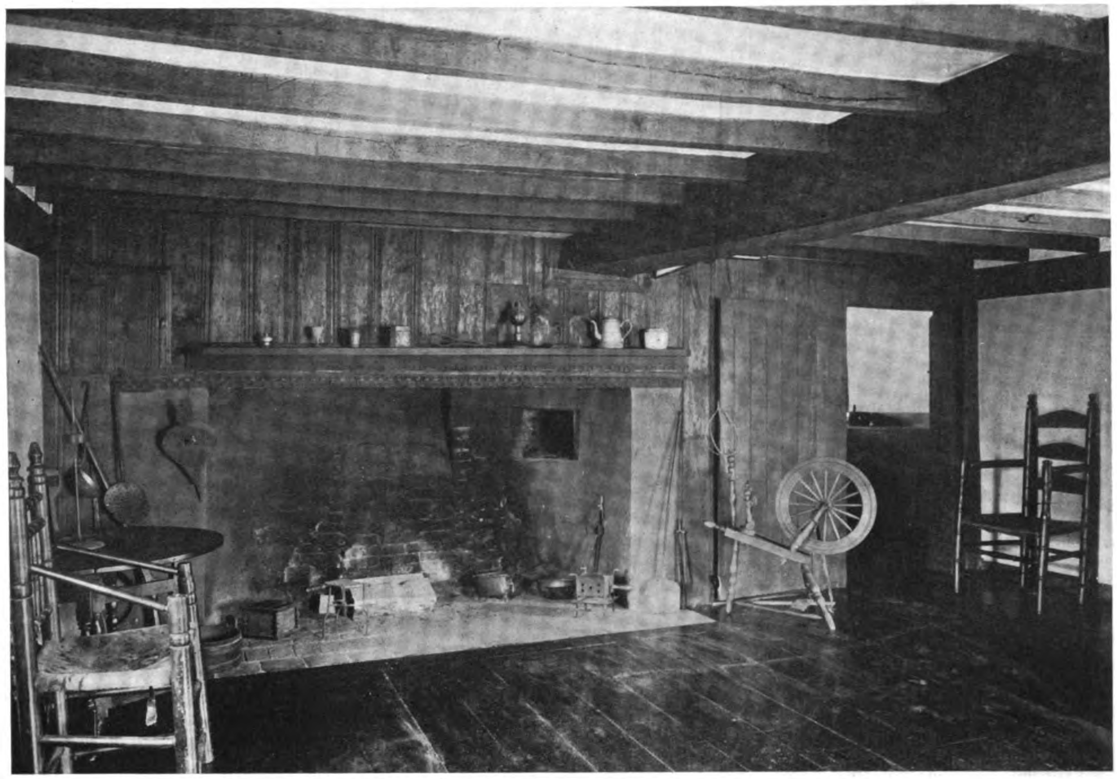
It will be found that good work results from the fact that the designer has applied fundamental ideas deduced from a well studied and thorough background. He has not learned his ideas in a school in colonial architecture which would but shortly reduce the style to little more than a mechanical product resulting from mere technical equipment. Individuality in work, therefore, must inevitably result from a particular kind of background personal to each individual and from the method of utilizing this background.

Almost any guiding principle may be adopted as a string on which the individual can thread the results of his study of the development of inside finish. The principle of interest has proved a very excellent guide for certain people and may prove so for others. How are the rooms of a house to be made interesting by means of inside finish? This immediately calls for a study of development under the guiding principle. What are the sources of interest?

The chief source of interest in the early, or seventeenth century, work is undoubtedly the interest which results from the contrast of frame or structure with the filling in between the members of this frame, whether on ceilings or walls. The frame has, of course, an interest in itself. The members are of different sizes. Rough hewn surfaces have the interest of texture which appears in all hand made work. In addition to this, there is also the interest of value in the varied natural colors which time gives to the wood. Given the



Chamber in the Hannah Robinson House, Saunderstown, R. I. Built about 1750



Interior of the Early Type in 17th Century House at Ipswich, Mass.

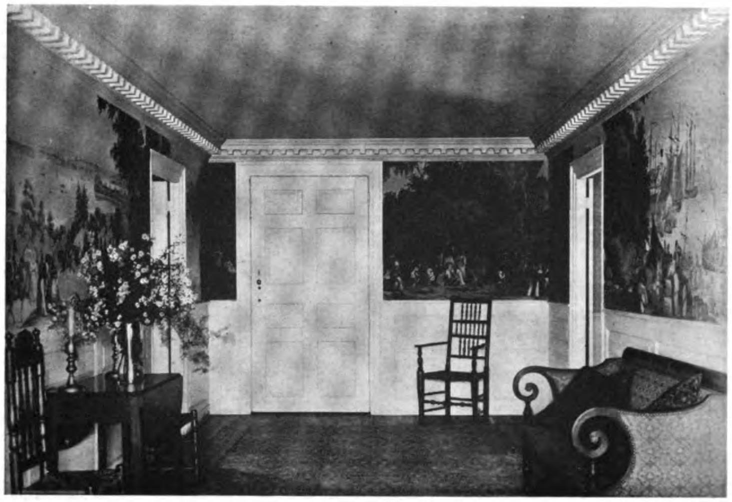
strong and interesting frame, it became the object of our early builders merely to seal this up,— one room from another and all of the rooms from out of doors. This seal was of two kinds, the flooring and the plaster between the uprights of the walls. The flooring contrasted in texture and, in some degree, in color with the frame itself. The plaster of the walls afforded a great source of interest in its strong contrast with the dark values of all the wood. We have then, as sources of interest in the early work, the use of the hand made heavy frame in contrast with the sawed lumber of floors and ceiling, and with the plaster filling of the walls.

The omission of plaster or rather the covering of the plaster in the later development of the style lost, of course, the interest due to contrast which the exposed plaster gave. There were, however, certain compensations. The development of the panel began with the sheathing of this time. The sheathing was probably first used as a covering of the face of the chimney, and then extended around all the walls of the room. The detail in connection with this is, of course, one of the sources of minor interest, but it is questionable whether these are equal to the loss of the larger interest due to the concealing of plaster.

The beading of this early sheathing became ultimately the deep indentation which resulted in the raised panel. This indentation, at first merely applied vertically, extended at last all the way around the panel. Simultaneously with this development of the panel came the casing of corner posts and beams, and the plastering of the ceiling between the larger beams. This resulted in a loss of the interest due to texture and this loss was compensated for by the use of paint. Paint afforded opportunities for new kinds of value and color contrasts in their relations to the plaster walls.

From this period on the interest due to finish is to be followed from a somewhat different angle. The woodwork is now white and its interest, aside from the interest of detail, becomes a matter of achieving variety, chiefly in the masses. We do not discover variety in the great amount of finish used as clearly as we do in a proper disposition of whatever amount is used. Some rooms are finished throughout in wood and yet are exceedingly monotonous. Variety is most easily achieved by avoiding balance within the limits of the wood finish itself. The unfinished parts of the walls of a room to which finish is applied should be employed, equally with the woodwork, to create the necessary balance in the room as a whole. Study of the old work of this period will show the way to do this. The single wood end in contrast with the three plaster walls, or in contrast with plaster walls plus dado, is the conspicuous treatment; and it is a treatment at once fundamental and capable of wide variation in handling.

The interest of the middle period work is the



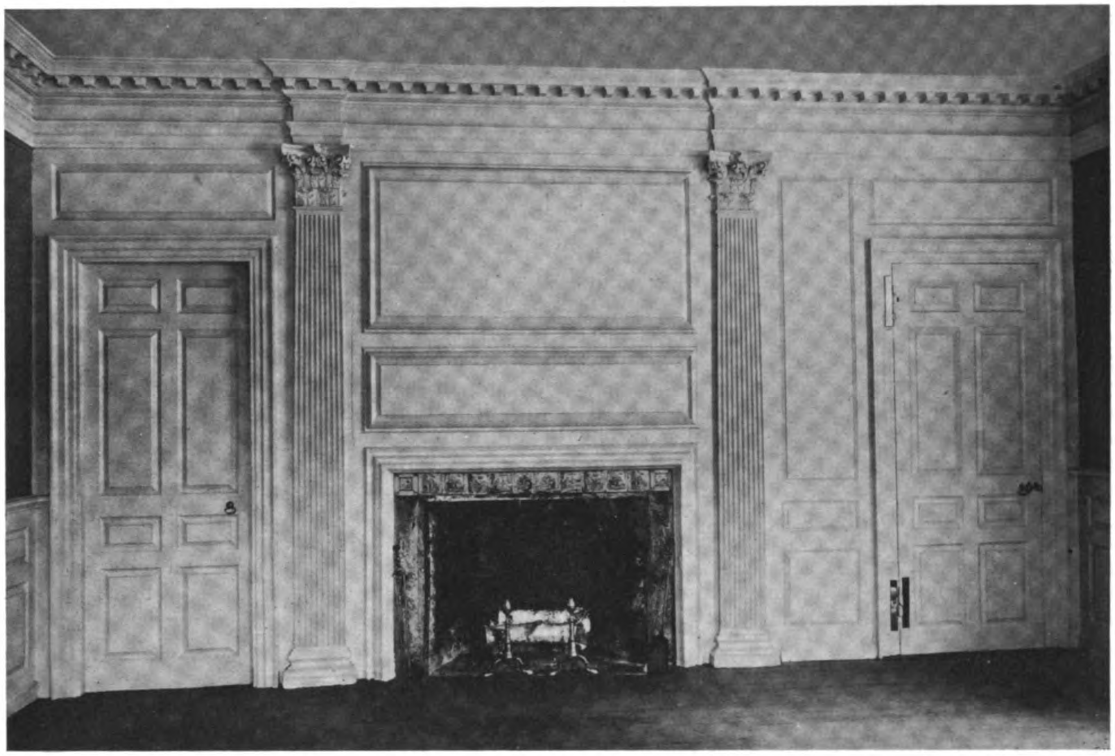
Modern Hallway. Designed by Derby & Robinson

on the other side of the fireplace. The dado comes in, divided up by its horizontal panels. The paneled wall is added above the dado. Architectural forms, part by part, are added and finally the colonial which is called, or miscalled, Georgian emerges into full view. Though the middle work may lack the commonly central interest of the other periods, it nevertheless has a series of minor interests which more than compensate. Furthermore, it has furnished most of those commonly known characteristics by which the style is known and to which, in the minds of many people, it is unfortunately limited.

interest which attaches to transitional development. From this point of view, at any rate, the period begins with the casing of the beams and the plastering of the ceiling. All the older methods and ideas are clearly discernible beneath the white painted veneer. The chimney becomes smaller, the fireplace alcove becomes a mere recess in the wall and then disappears entirely. The door leading to the entry takes to itself panels and is duplicated

The work of 1800 represents the highest development in the design of inside finish which the country affords. It is in widest contrast with the early or Gothic work. This, and its development, was of what might be called the casual type. Its interest lies to a considerable extent in this very characteristic of casualness. Though fundamental, it may almost be said to have happened. The 1800 work, on the other hand, is the result of study. In 1800 work nothing ever

Room in the Fowler House, Danversport, Mass. Built in 1805



DETAIL FROM JEREMIAH LEE HOUSE, MARBLEHEAD, MASS. BUILT IN 1768

EXAMPLE OF DETAIL IN A RECENT HOUSE AT CONCORD, MASS.
FROHMAN, ROBB & LITTLE, ARCHITECTS

merely happens. In the best examples of it everything belongs, nothing is missing, the result is perfect. It has the interest, therefore, which attaches to any fine work of a sophisticated order. Rules were developed for the proportion of part to part and a knowledge of these rules was taken for granted among the best designers. One of the best results of these rules of proportion is found in the establishing of scale which they accomplished. Having worked out a satisfying relation between the parts they were then able to apply this relation in its integrity to each particular case. If the size of an architrave was five inches for an opening of one size, it became so much larger or smaller for a larger or a smaller opening. This, clearly, was taking a leaf from the book of the perfect Greeks. The study of 1800 work, therefore, leads in itself to an education in colonial work at its highest stage of development.

With a study of the major sources of interest it is well to combine a study of the minor sources also. The superficial characteristics of colonial work are easily noted and are reproduced without difficulty, and they have gotten so into the air that even a layman can recognize them. But results after this pattern, though they may have a kind of vulgarized character, are always bad and are really more reprehensible than work which does not even attempt to achieve a particular style. Knowledge of detail will tend to correct the designing of bad work and a study of detail, by way of the kinds of interests involved, will build up the necessary background of knowledge.

Study of inside finish is not to be confined to the three principal epochs of our native architectural development. There are, of course, the sectional variations of the periods themselves, as Southern work, Northern work, and the work of the middle states. In addition, there are the local variations within each of the larger sections. Covering the entire field means a great deal of study, much more than most practising architects are likely to give to colonial work; but a thorough examination of however limited a part of the field will develop in the student a respect for the style and skill in his use of it which will go far toward correcting the vicious and apparently growing tendency to vulgarize it.

Detail of Parlor in the Hannah Robinson House, Saunderstown, R. I. Built about the Middle of the 18th Century

CHARLES A. WHITTEMORE, *Associate Editor*

Building Foundations

PART I

By J. R. WORCESTER

THE chief function of building foundations is to transfer the weight of the building to the ground, thereby securing a safe, permanent and immovable support for the structure. Secondary results are often obtained, by use of foundations, such as retaining surrounding ground at a level higher than the basement floor, but these should not be confounded with the principal use. It is evident that to properly design foundations one of the first necessities is to calculate the load coming upon the different parts. This requirement produces the sometimes embarrassing situation that while the foundation must be constructed before the rest of the building, it cannot be properly designed until the plans are far advanced and approximate loads ascertained.

Consideration of Loads

By far the most important part of the load is the weight of the building itself, or the "dead" load as it is commonly called. This is always present and active, and the effect on the soil is much greater from a constant force than from a load suddenly applied and soon removed. There is an advantage in this circumstance in the fact that the dead load can be accurately computed, while the "live" load is always problematical and a matter of assumption. The lesser effect of the live load is recognized in most building regulations by the provision that a decrease in the assumed live load is permitted in parts supporting large areas and several stories.

In computing the loads on foundations it is necessary to know in a general way how the floors are to be framed, for not only is the weight of the floor itself dependent upon the framing, but the direction of beams and girders will determine which walls and piers are bearing walls, and which carry little or no floor loads.

It is desirable in calculating loads to keep the dead and the live separate throughout. This enables one to apply the proper reduction to the live load as a whole, and it is generally a simpler way to do it. The live load on foundations may usually be obtained with sufficient accuracy by multiplying the floor area contributory to a wall or column by the number of floors and the unit load, without following out the reactions from individual beams and girders.

Thus far we have been considering only the vertical force due to gravity. There are also certain conditions under which horizontal forces must be taken into account. The horizontal force of the wind need be considered, as affecting foundations, only in rare instances. In the case of a tower, a tall isolated chimney, or a wall standing by itself, the wind pressure may cause an appreciable increase in the load on the foundation in the leeward side, but in buildings of common proportions this increase may be ignored.

The horizontal force of earth against a retaining wall is a real factor which often affects the design. This force is not always disadvantageous, as it tends to resist the "tipping" effect of a load on an eccentric base, and thereby may relieve what would be an excessive load on the soil. The subject of lateral earth pressures is too large to be considered within the limits of the present article.

Supporting Power of Ground

Having ascertained the vertical loads which are to be transferred by the foundations to the soil, the next step is to determine the power of resistance of the material upon which they will rest. This may vary all the way from zero to infinity or, more truly, from so small a value as to be unfit for carrying any structure, to a value greater than that of any form of building material that could be used for a foundation. At the lower end of the scale are loam, peat and mud; at the other extreme is solid ledge. Between these lie innumerable gradations.

A knowledge of the geology of the location is of great assistance in a determination of the strength of the underlying material, and with such knowledge, test pits to the level of the natural bottom of the foundations, and sounding with a bar below this grade will usually furnish the necessary data. Where the geological formation is unknown, and where there is a possibility of there being soft material below, the safe course is to obtain borings in several parts of the location, carried low enough to establish the general character of the ground. In sand, silt or clay, borings can be made with an auger; but where miscellaneous materials are encountered the simplest method is by the "wash boring" process. This in the hands of experienced men gives very reliable results.

After obtaining information as to the nature of the soil at different levels a decision must be made as to the stratum upon which to depend for support, and the carrying capacity of this stratum. Soils which have been deposited through water are usually found to be stratified in layers approximately level. These layers, varying in the coarseness of their particles, differ as to their carrying capacity, and it is often possible to take advantage of this condition by applying the foundation to the top of a hard stratum, or crust, which will help to distribute it over a greater area of soft material below the crust. A few general rules as to choice of soil may be of service.

1 — Filled ground is unreliable, and permanent structures should not be placed on filling. The reasons for this are two: first, because the filling material is generally poor and full of voids, allowing it to compress and contract for many years; and second, because in most cases the filling has been dumped upon what was top soil, containing organic matter,— mud, peat or loam. This rule, though general and always safe, may be unnecessarily severe in exceptional cases. Where a sand or gravel fill has been in position long enough to have become thoroughly consolidated, and where the original surface was not soft, the objection to resting directly upon the fill may be so slight as to be negligible.

2 — Soil containing organic matter is compressible, and will contract as the organic material decomposes. It is therefore unsuitable as a support for a permanent structure. This rule, too, is to be applied with discretion, for the proportion of organic matter varies all the way from 0 to 100 per cent. Alluvial soil contains more or less organic matter and where this extends to great depth it may be necessary to depend upon it. On the other hand, where clay, sand, gravel or rock are within reach of the surface, and are overlaid with silt, peat, mud or loam, it is distinctly worth while to penetrate to the organic part of the soil.

3 — A soil which has very slight carrying capacity, when free to flow, may be entirely satisfactory as a supporting medium when confined. It is important, with material of this character, to distribute the weight of the structure so that as far as possible the load per square foot will not differ greatly in different parts of the building. Two examples of the effect of unequal distribution are well known in Boston. The New Old South Church on Boylston street has settled more at the corner where the tower is than elsewhere, causing the inclination of the tower. The Public Library is loaded much more heavily in the rear, where the book stacks are located, and the rear has settled more than the front. Both of these buildings are carried by piles down to a crust of sand and gravel which, in turn, is supported upon a deep bed of very soft clay.

For the foundations of important structures in questionable localities it is worth while to test the bearing value of the soil. To be of service this testing must be done with care and judgment, particularly if the soil is plastic and likely to flow if not confined. A good way is to excavate a pit to a depth within a foot or so of the level at which the soil is to be tested. This pit should be large enough to allow a man to work comfortably at the bottom. A small excavation should then be made in the center which, at the bottom, will be just the size of the loading plunger, and be leveled off at the required grade. The testing plunger may be a square stick say 12 by 12 inches and long enough to reach to the surface, where it may be fitted with a platform to carry the load. The platform may be stayed in position by boards, laid horizontally, extending out in two directions and attached to stakes driven into the ground. The best way to observe the settlement is by means of a surveyor's level sighting on a rod fixed in the top of the plunger.

The most careful tests should be accepted with reservations. One should remember that, on the one hand, a long time test might show a different result from a short time experiment while, on the other hand, a load applied to a single square foot is more liable to cause a settlement in many soils than if the same pressure per square foot were applied to a larger area at the same time.

It is unsatisfactory to attempt to formulate definite rules for safe bearing pressures because of the difficulty of describing soil conditions so that they will be recognized with certainty. For instance, "soft" clay means very different consistencies to different persons. To describe it as "putty like" does not help much, for putty, as we all know, may vary in softness quite as much as clay. The same is true with sand and other materials. Building laws of different cities prescribe loads for "firm, coarse sand" all the way from one and three-quarters to ten tons per square foot. A few suggestions may help in deciding upon a safe load in some cases.

Clay in its natural position, when below permanent ground water level, may be so soft that a shovel or a bar can be pushed into it without much exertion. In this condition, unless the soil is confined so that it cannot flow laterally, it has very little supporting power. On the other hand, if it is confined by a stratum of harder material over it, with no chance of deeper excavations nearby, it will carry a considerable load, or say two tons per square foot. The clay itself is practically incompressible and is inferior in supporting power only through its flowing quality. As the percentage of water contained in the clay decreases, its consistency becomes harder. A very common consistency is that in which a shovel can be inserted with difficulty, and a bar can be forced down only a little way at a time. Three and one-half or four tons per square foot is not likely to overload the clay in this condition, and there is not much chance of its flowing laterally. Where moisture is still less, clay may be found in all degrees of hardness up to a condition of shale, on which ten tons per square foot would be perfectly safe, and intermediate degrees of hardness would warrant intermediate loads.

Sprinkler Installation for Fire Protection

PART III — RULES FOR SIZING PIPE

By W. D. BROWN, C.E.

WHEN a large floor area is divided by a fire wall, a fire starting on one side of the wall will be controlled by automatic sprinklers before it can spread to the opposite side of the wall. Under these conditions, the floor becomes two small areas in place of one large area and pipe sizes are reduced accordingly.

Note: A fire wall is a term applied to a brick, concrete or other non-combustible wall, with a parapet above the roof and all openings equipped with fire doors on both sides of wall, one of which must be self-closing.

In buildings where top flooring is thoroughly tight and all floor or wall openings on one floor are protected to prevent drafts communicating to any other floor, a fire will be controlled by sprinklers before it spreads to any other floor. Under these conditions each floor becomes a separate fire area.

Where extraordinary conditions exist and where there is likelihood of a fire passing through unprotected openings, pipe sizes should be increased accordingly. For example, in areas such as stair towers where a fire starting at the lower landings might spread rapidly above or generate sufficient heat to open sprinklers under upper landings, the entire area should be considered as one fire area and pipe sizes kept large enough to supply all the sprinklers in this enclosure.

LOCATION OF SPRINKLERS — Sprinklers should generally be located in an upright position. When construction or occupancy of a room or enclosure makes it preferable, permission may be given, except on a dry pipe system, to locate sprinklers in a pendant position.

For example, in the first story of a department store pipes are usually concealed above the plaster ceiling and sprinklers only exposed below, a small rosette or moulding placed above the sprinkler improving its appearance.

It will be seen that this takes an extra piece of pipe extending through the plaster, and two extra joints for each sprinkler. For this reason extra care must be taken with this type of installation.

Concealed sprinkler installation costs approximately 25 per cent more than exposed work, and is prohibited except where absolutely necessary.

Concealed piping should be painted two coats of good protective paint, one before and one after installation. The pipes may be placed in ducts or thoroughly enclosed in cement but in no case should they form a part of the reinforcement.

Sprinkler deflectors should be parallel to ceilings, roofs or the inclines of stairs, except when installed in the peak of a pitched roof when they should be horizontal.

Distance to the top of the deflectors from the ceiling of mill or other smooth construction, or from the bottom of joist construction, should not be less than 3 inches nor more than 10 inches; 5 to 8 inches is the best distance. With the average type of sprinklers the minimum and maximum distance from sprayed surface to center of pipe would be 7 and 14 inches.

In the case of fire-resistive building, the distance between deflectors and ceiling may be increased where conditions warrant, as, for example, under a paneled ceiling and in semi-mill or unusual construction where it is necessary to keep sprinklers below beams, or where, as in the case of a fireproof building, the object is to protect the combustibles rather than the building material.

Sprinklers should be placed everywhere throughout the premises, including basements and lofts, under stairs, inside elevator wells, in belt, cable, pipe, gear and pulley boxes, inside small enclosures, such as drying and heating boxes, tenter and dry room enclosures, chutes, conveyor trunks and all cupboards and closets unless their tops are entirely open, or arranged so that sprinklers can properly spray therein.

Special instructions should be obtained from the inspection department having jurisdiction relative to placing sprinklers inside of show windows, telephone booths, boxed machinery, metal air ducts, ventilators, concealed spaces, and under large shelves, benches, tables, overhead storage racks, platform and similar water sheds, and over electrical generating and transforming apparatus and switchboards.

Note: Paper or similar light, inflammable covering is sometimes used over clothes and stock closets, and in case of fire is quickly burned away allowing the water from sprinklers a clear passage.

Experience teaches that sprinklers are often necessary where seemingly least needed. Their protection is required not alone where a fire may begin, but also wherever any fire might extend, including wet or damp locations.

Sprinklers are omitted by most insurance inspectors, in fireproof stair towers when isolated from main buildings. Sprinklers installed in such areas are at the tops of the towers which must be protected. Some inspectors require one sprinkler under the first landing in the basement of a fireproof stair tower when this space might be used for storage.

Sprinklers cannot be expected to keep out fire originating in unsprinklered territory and stringent measures should be used to properly cut off all unsprinklered portions of a building or exposures.

When a building fully equipped with sprinklers communicates with another not so equipped, the opening must be protected by standard fire doors on both sides of the walls, one of which must be self-closing.

The danger of sprinkler protection being impaired by exposure fires should be reduced by providing shutters, wired glass or open sprinkler protection at exposed openings.

RISERS — There should be one or more separate risers in each building and each section of the building divided by fire walls. Each riser should be of sufficient size to supply all the sprinklers connected with it for any one fire area, as determined by the general schedule of pipe sizes. In case of riser pipes passing through cinder concrete, a sleeve or some other suitable device should be provided to prevent corrosion.

Risers should be located as near the center of a building as possible.

VALVES — Each water supply should be provided with a gate valve located where readily accessible. Gate valves in supply pipes to automatic sprinklers should be secured open by devices such as padlocks or riveted leather straps. A check valve should be installed on each source of water supply. Its purpose is to prevent water from one source of supply entering into some secondary source, and also to prevent the water in the sprinkler system from returning to the city main. A check valve is constructed with a clapper which allows water to flow in but one direction.

FITTINGS — Both from the standpoint of appearance and efficiency a one-piece reducing fitting of good design should be used wherever a change is made in sizes of pipe. Bushings and couplings should not be used except where unavoidable.

Long turn fittings should be used on risers and supplies to cross mains for 2½-inch and larger pipes to reduce loss of pressure due to friction.

HANGERS — Sprinkler pipes, with few exceptions, are hung or suspended from the ceiling by wrought or cast iron hangers. Hangers should be of adjustable pattern so as to allow all sprinkler pipes and fittings to thoroughly drain. Pipes should pitch ¼ inch in 10 feet on wet system and ½ inch in 10 feet in the dry system.

Fig. 5 is a view of an adjustable hanger used quite extensively. "A" is the foot piece hung to the ceiling by screws, "B" is the rod with a long thread for adjusting and "C" is the ring for the pipe.

LOCATION OF HANGERS — The ¾-inch pipe at the ends of all branch lines when over 6 feet in length should have two hangers and other lengths of pipe on branch lines should have one hanger each, located not less than 12 inches or more than 18 inches from sprinklers as shown in Fig. 6.

The first piece of pipe from a feed main on a branch line, when 1½ inches and smaller and 8 feet or more in length, should have a hanger which may be placed about 2½ or 3 feet from the cross main. When less than 8 feet no hanger is required except that in the end bays a hanger would take up whatever sag there may be in the main pipe, from the last beam to stringer line.

Each length of feed main pipe should have a hanger located at approximately half the distance between stringer lines. Pipes connecting riser to feed main and all random pipes should be equipped with hangers spaced not more than 10 feet on centers.

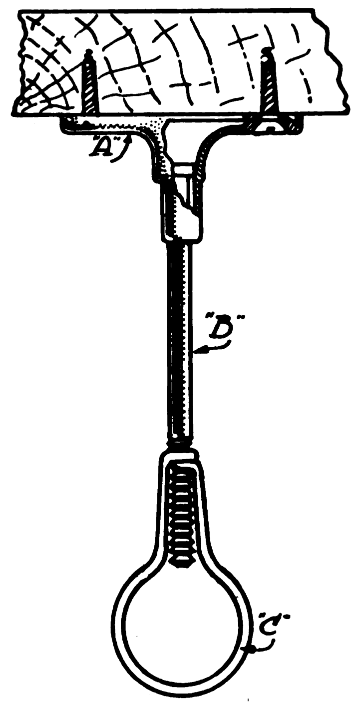


Fig. 5

When setting inserts, as in the case of a concrete building, it is recommended that sprinkler lines be located in the center of the bay. This arrangement permits even distribution of water to all portions of the bay, and in some cases reduces the required number of sprinklers. For example, in the case of a sprinkler covering its maximum allowed area with line in center of the bay, a line off center would increase the distance from line to edge of bay which would necessitate additional sprinklers.

ALARM VALVES — There should be one or more valves located in each building and each section of a building divided by fire walls. This valve should be so arranged that an alarm will be given when the opening of a sprinkler causes a flow of water through riser and valve. In general, an alarm valve is a check valve with a weighted clapper installed in the riser. Under normal conditions the pressure throughout the sprinkler system will be the same as that on the supply side of the alarm valve, the weight of the clapper keeping it closed.

In case a sprinkler head opens, the pressure on the system side of the check valve is immediately relieved and the continued pressure on the supply side will open the clapper of the valve. The opening of the clapper in an alarm valve permits a flow of water through a small pipe which operates a mechanical gong on the outside of the building. At the same time an electric device, regulated by the flow of water or action of a clapper, operates a gong, which is usually located in the watchman's headquarters.

Dry Pipe Valves — Buildings that have no heating facilities or such portions of a building where water in sprinkler pipes would be apt to freeze, should be equipped with a so-called "dry pipe" system.

The piping in the area exposed to freezing temperature is filled with compressed air and between the air-filled pipes and the water supply is located a dry valve, that is, a valve in which air pressure on one side balances the water pressure on the other side. When a sprinkler opens, the air escapes and the pressure of water opens the dry pipe valve which admits water to the sprinkler system. The water flowing through a dry pipe valve operates the mechanical gong and electric bell.

A dry pipe system is only used where it is inadvisable to install a wet pipe system, as the interval between the opening of the sprinkler and the arrival of water at the seat of the fire might allow the flames a start which would open up more sprinklers than necessary and cause an increased water damage. The air capacity of a system depends upon the number of sprinklers controlled by the dry pipe valve. This number should not exceed 300, and 400 should be the maximum allowed. The reason for this is that the greater the volume of air in the system, the longer it will be before water is released.

Dry pipe systems should be so designed as to eliminate long runs of pipes between dry pipe valves and sprinkler feed mains, as each gallon capacity of such pipes is equivalent to one extra sprinkler.

Where more than the number of sprinklers allowed on one dry valve are necessary and two or more valves are installed in a building containing two or more floors, the system preferably should be divided horizontally by consecutive floors. With this arrangement sprinklers opening on one floor would operate but one valve and the alarm would indicate location of operating sprinklers.

The dry pipe valve should be located in a warm room, or in a frost proof valve closet, well lighted. Space of at least 2 feet 6 inches should be allowed on all sides of the valve.

Electric, steam, hand and belt driven air compressors are used to maintain air pressure on the system. The supply for an air compressor should be taken from a location where the least possible amount of moisture will enter the system. The loss of air pressure on the average system requires additional pumping about once a month.

Fire Department Connections — Very often the underwriters require a brass Siamese connection located on the outside of a building and fitted with couplings threaded to the same standard as used by the local fire department. The purpose of these connections is to allow the public fire department steamers to increase water pressure in sprinkler systems and standpipes. Each connection, when used for sprinklers, must be marked in raised letters, one inch high or larger, "Auto Sprinklers."

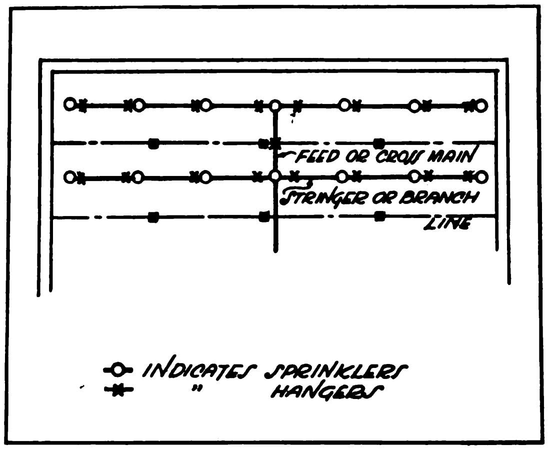


Fig. 6

Tests — The tops of all wet pipe sprinkler risers should have a ¾-inch pipe connection equipped with a control valve and so arranged that water will discharge through a ½-inch brass outlet. The flowing of water through such an outlet is equivalent to water flowing through a sprinkler and should operate alarms and it also indicates to the inspector that the water has an unobstructed passage throughout the system.

On the dry pipe system a small pipe is connected on the water side of the dry pipe valve and so arranged that the opening of a valve allows the water to operate the mechanical gong and electric bell for testing.

At alarm and dry pipe valves the main drain pipe for an entire system should be connected to some sufficient outlet so as to allow the opening of the drain valve and the full flow of water without overflowing any service connection. This drain pipe should be not less than 2 inches in size. With the full flow of water in this pipe the reading on the pressure gauge will give the reduction in pressure equivalent to the opening of sprinklers caused by an average fire.

Tests after Installation — All wet pipe systems should be tested to at least 150 pounds pressure and be subject to this pressure for two hours. If normal pressure exceeds 100 pounds this test should be made with 50 pounds above normal.

A dry pipe system should be tested to an air pressure of at least 40 pounds, and all leaks stopped so that the system will not allow a greater pressure loss than 1½ pounds in twenty-four hours.

PRESSURE GAUGES — Pressure gauges of standard make and a 4½-inch dial should be installed on all water supplies. In each sprinkler system one pressure gauge should be located below the alarm valve and one above the alarm valve, also one "water" pressure gauge should be located on the supply side of a dry pipe valve and one "air" pressure gauge on the system side of the dry pipe valve.

HAND HOSE CONNECTIONS — Small hand hose connections are valuable for extinguishing small fires under decks, tables, etc., when discovered and before sprinklers operate. These hose connections are attached to sprinkler piping under certain restrictions. Connection to a sprinkler system should be through 1-inch pipe and not connected to any sprinkler pipe smaller than 2½ inches. Hose should be 1½ or 1¾ inches in diameter and of unlined linen. Nozzle should not be larger than ½ inch.

OPEN SPRINKLERS — Open sprinklers have proved a great help in protecting windows, cornices and portions of frame structures from fires near by. Although satisfactory in forming water curtains they are not sufficient protection to be used in preference to fire shutters. In conjunction with them, however, a barrier is produced that fire can scarcely cross. They have deflectors similar to those of automatic sprinklers but have no struts or braces.

Unlike the automatic sprinkler open sprinklers depend upon the human element for proper functioning. Supplies to the open sprinkler are controlled by a valve which is normally kept closed and is manually operated when water is required in the system. Supply for open sprinklers should be a city connection rather than a tank or any exhaustible supply. At the top of a riser pipe a pipe should be connected inside of a building and an outlet left for pressure gauge.

SIZES OF ORIFICES FOR WINDOW SPRINKLERS —

	2 Stories	3 Stories	4 Stories	5 Stories	6 Stories
Top line	⅜ in.	⅜ in.	⅜ in.	⅜ in.	⅜ in.
Next lower	5/16 in.	5/16 in.	⅜ in.	⅜ in.	⅜ in.
Next lower		¼ in.	5/16 in.	5/16 in.	5/16 in.
Next lower			¼ in.	5/16 in.	5/16 in.
Next lower				¼ in.	¼ in.
Next lower					¼ in.

Where there are over six horizontal lines of windows it may be preferable to omit sprinklers on the first and possibly on the second stories.

PIPE SIZES — Branch lines should not have more than six sprinklers.

Branch lines — Sizing

⅜ in. orifice one head ¾ in. pipe, two heads 1 in. pipe, four heads 1¼ in. pipe, six heads 1½ in. pipe.

5/16 in. orifice one head ¾ in. pipe, three heads 1 in. pipe, six heads 1¼ in. pipe.

¼ in. orifice one head ¾ in. pipe, five heads 1 in. pipe, six heads 1¼ in. pipe.

SIZES FOR RISERS AND FEED MAINS —

1½ inch pipe not over 6 heads.
2 inch pipe not over 10 heads.
2½ inch pipe not over 20 heads.
3 inch pipe not over 36 heads.
3½ inch pipe not over 55 heads.
4 inch pipe not over 72 heads.

Where the supply pipe to a branch line is over 25 feet in length, these pipes should be at least one size larger than the table requires. At all dead ends a 6-inch nipple and brass plug should be installed for blowing out any foreign substance. All pipes, back to cast iron pipe and also all exposed material should be galvanized. Arrangements should be made to drain pipes back to control valve.

LOCATION OF OPEN SPRINKLERS — For windows not exceeding 5 feet wide one sprinkler should be placed at the center, near the top. Where windows are over 5 feet wide, or where mullions interfere, two or more sprinklers should be used. In some cases one sprinkler has been installed in a window 6 feet wide by special permission from the inspection department having jurisdiction as constituting an exceptional case.

CORNICE, SIDE WALL OR RIDGE POLE SPRINKLERS — On frame buildings, mansard roofs, etc., pipe sizes and arrangements should be the same as for window sprinklers, excepting that where water supplies admit, the inspection department having jurisdiction may revise this schedule. Sprinkler heads should be spaced so as not to exceed 8 feet on centers.

UNDERGROUND PIPING — Cast iron, bell and spigot pipe should conform to the standard approved by the inspection department having jurisdiction. This pipe is made in 12-foot lengths and fitted with a bell outlet on one end and a spigot on the opposite end.

Joints are made with lead and packing. The connection between bell and spigot pipe and inside screw pipe should be made with a flange spigot casting, the spigot joint made outside of the building and flange connection located inside of the building. This arrangement eliminates all lead joints inside. Underground pipes should be buried to a depth of at least 1 foot below lowest frost line to top of pipe. This distance varies from 2½ feet in Southern states to 10 feet in the Northern part of Canada.

Hydrants and hydrant houses should conform to requirement issue by the inspection department having jurisdiction. Indicator post valves controlling sprinklers should be located at least 40 feet away from a building, and the name of the building and the service it controls should be plainly stenciled on the valves.

A House in the Southern Colonial Style

RESIDENCE OF THE HON. LATHROP BROWN, ST. JAMES, LONG ISLAND, N. Y.

PEABODY, WILSON & BROWN, ARCHITECTS

THERE is always something of particular interest in a house that is directly inspired by some great and well known prototype which has had an important influence on the history — social or architectural — of the country. It is not necessary that the house be a copy, an exact reproduction of the original, for an added interest exists when it differs in many respects from the prototype or when the original is followed in only a general way.

This interest is found, to a very marked degree, in a country house near Stony Brook, Long Island, the home of the Hon. Lathrop Brown, designed and built under the direction of his architects, Messrs. Peabody, Wilson & Brown of New York. This very successful house is obviously inspired by Westover, but there has been no effort to make the newer house a copy of the old which would have been impossible since the Long Island house is very much the larger and the life lived on Long Island in the twentieth century differs in many respects from that which obtained in Virginia in the eighteenth.

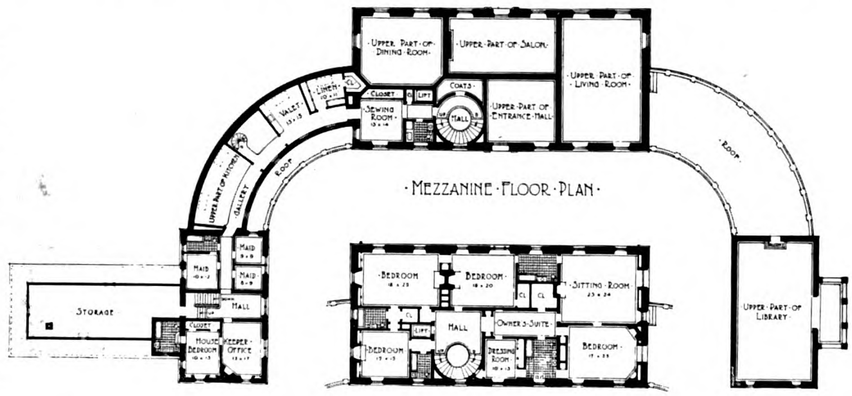
The Brown house stands in a small valley facing Stony Brook Harbor and about 200 feet from the beach. Like its Virginia prototype this house has two façades, that which faces the water and another front which faces what will later on become a very stately garden.

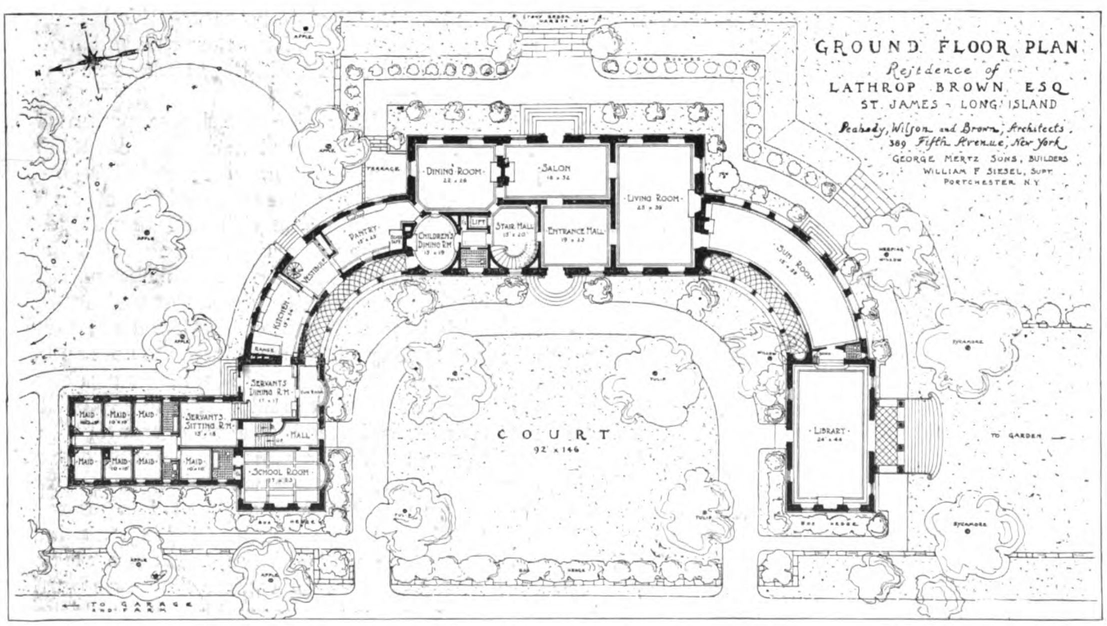
Seen from either side the house presents an appearance of a broadly planned mass of buildings which with their "informal formality" go far toward carrying out the atmosphere of an old estate in Virginia. The rich and unusual color and texture of the walls, the low, square chimneys and the widely extended service buildings contribute largely to the appearance of comfort and hospitality which is so well expressed. Upon the garden side the planting adds a more intimate note and the balanced arrangement of the buildings carries out the feeling of complete and well ordered spaciousness which is indicated by the water front.

Connected with the main structure by covered, curving passageways are two minor or accessory buildings, as at Mt. Vernon, placed to allow the broad sides to face south, insuring maximum sunshine. The walls of the house are of brick transported from Virginia where they were roughly moulded by negro laborers and burnt with hickory; the bricks are somewhat larger than those ordinarily used to-day, and are of a strong orange-pink color and were wire brushed to obtain more texture and brilliancy of color. The yellow lime joints are rather small. Against this strong background are columns and other details about the entrance door of Petros bleaching limestone such as is used for St. Thomas' Church, New York. The slates of the roof were taken from an abandoned quarry in Virginia; cornices and window frames are of cypress which has had the soft grain removed by the use of a torch and wire brush which gives a mellowed, antique effect.

In floor plan the Long Island house follows to a great extent that of certain great Virginia country houses and in many of these earlier homes the stairs are not set in the entrance hall but are placed elsewhere. In this instance they make two turns to the second floor, and at the first landing give access to the service passage which extends over the kitchen and pantry. This plan has several advantages; it prevents the kitchen and pantry from being used as a passageway, yet they both have windows east and west; it obviates the necessity of rear stairs and, most important of all, it makes unnecessary a rear hall on the second floor, which allows the northeast and northwest bedrooms to be intercommunicating and, therefore, cooler in summer. The only general hall space on the second and third floors, though the main building is 94 feet long, is the stair landing, as in Westover and in several of the Annapolis houses.

The children's oval dining room, with a ceiling of 8 feet 6 inches, serves as a pleasant contrast to the large, high ceiled dining room and allows for a sewing room and toilet on the mezzanine. This is used for a women's dressing room in times of entertaining and obviates the necessity of having two sets of coat rooms and toilets on the ground floor. The guest room walls on the third floor have been furred out to hide the slanting roof, and to allow of a more formal decorative treatment of the rooms. A possible sleeping porch has been





Ground Layout Showing Orientation of Group

Main Front of North Wing

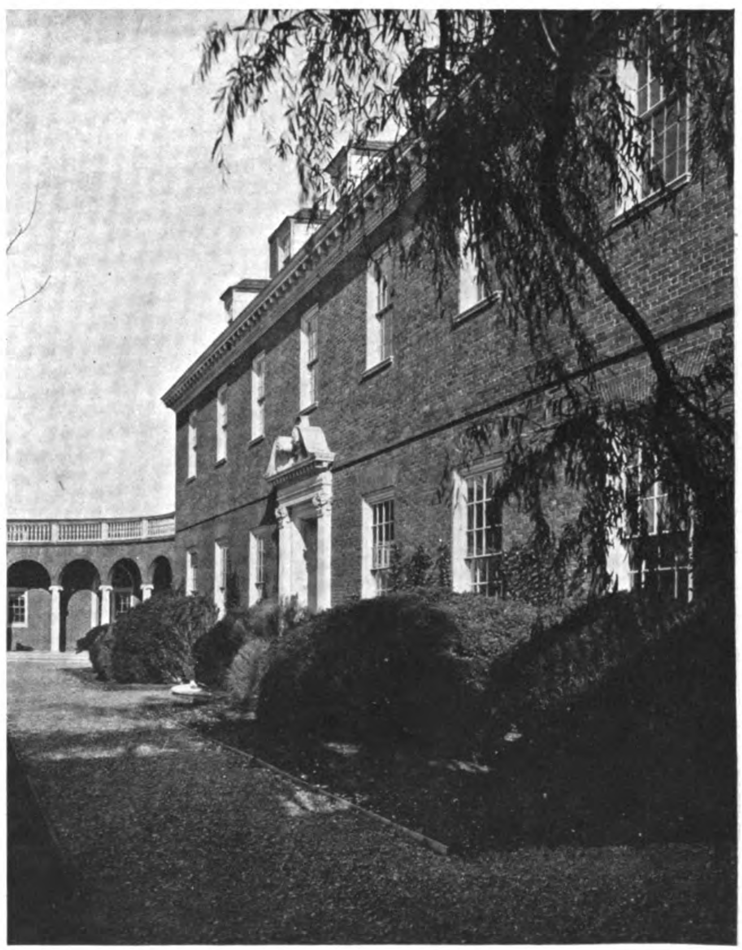
brown tiles for hearth and sink-back, and black and white checked tile floor. The breakfast room, the only finished interior of the main house, has a Georgian mantel, green and red Japanese chintz on walls, painted furniture and black pine floor.

The entrance courtyard contains some magnificent box bushes, moved from Wading River and Stony Brook, and many willows and tulip trees. A white garden house with red domed roof, similar to that at Montpelier Manor, near Washing-

arranged in the center room, the easterly wall of which is all windows of the accordion type.

The curved sun room, facing east and south, is meant to catch the sun's warmth in winter. For the summer, the arched windows have been designed to drop out of sight in pockets in the floor, making the porch entirely open. The floor of this porch is warm brown and blue flagging quarried from a mountain in Virginia by the architects themselves.

The south wing, one of the two accessory buildings which are reached by the arched and curving passageways, was designed as a Spanish library, with a vaulted ceiling 26 feet high, to contain several Zuloagas and other modern pictures. It has a huge stone Renaissance mantel and the floor is to be Mexican "Colima" oak. These two low studded wings make complete houses of moderate dimensions; the schoolroom, which balances the library at the far end of the group, is temporarily used as a living room, with early eighteenth century Georgian panels, painted. The kitchen, 17 feet high, is white with trim filled out in black, varnished orange and brown chintz in backs and sides of cupboards, orange and



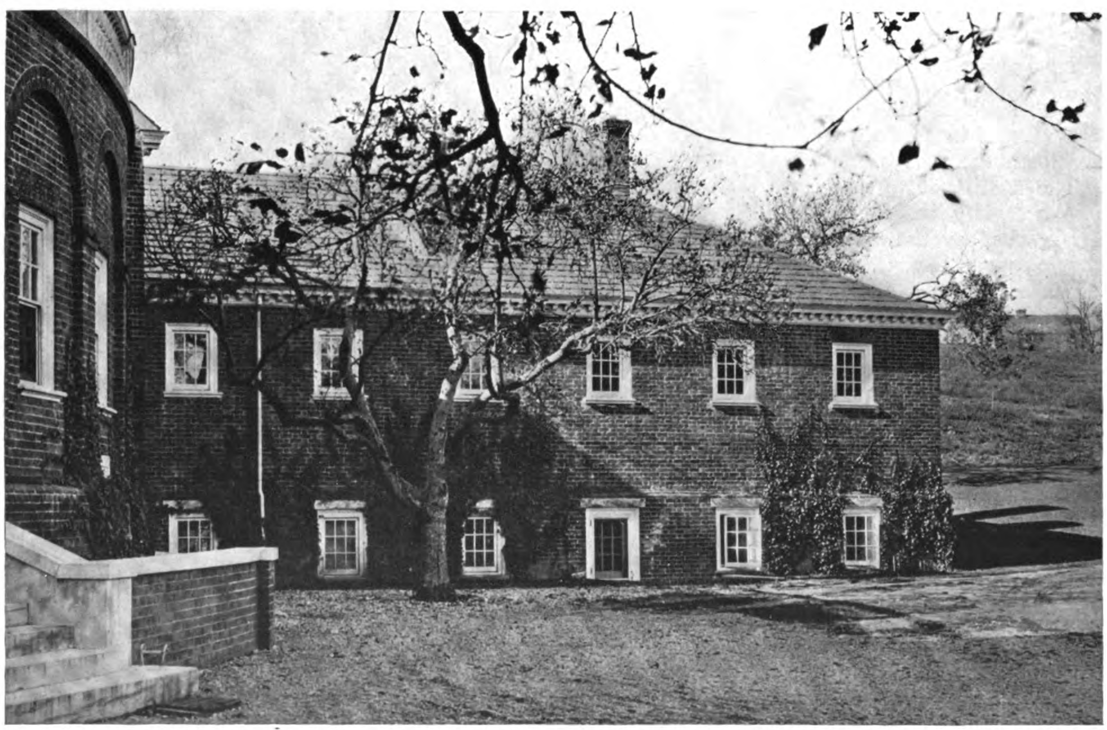
Entrance Front from Sun Room Porch

ton, is to terminate the long vista at the end of the garden.

This house differs from most recent examples of the so-called Georgian types in that it has been kept as simple as the models from which the architects were inspired. There are no large columns, supposed by laymen to represent "colonial," because colonial houses did not have large columns. We are indebted to an illustrious Democratic president, Thomas Jefferson, architect as well as statesman, for our era of double story porches. Nearly everything, except the front door and the cornice, was left to nature and to time to give an air of hospitality, dignity and domesticity. Without the friendly aid of big tulip trees and the warm effect of weathered brick, no large house such as this can help looking bare. But so did Whitehall and Montpelier Manor and Westover until nature did its work. One cannot make a new colonial house look old by covering it with white porches, shutters, columns and "stunts." It just looks unhappy and tortured. The architects' aim has been to build a background for nature's columns and ornaments,—tulip trees and box bushes, vines and green pastures, which fit infinitely better with a simple, restful structure, such as were built by our forefathers from English models, than with a complicated mass of masonry which looks interesting on a piece of tracing paper and like a nightmare in reality.


Detail of Library Window

It is not often that a large country estate is created which does not for several years present the appearance of a new arrival, and many years are usually required for the complete fitting of buildings into their setting so that they have the appearance of having always existed. The creating of this appearance of settled age is one of the functions which present day architecture is often called upon to assume.


Garden Side of Service Wing

The Planning of Automobile Sales and Service Buildings

PART II

By F. A. FAIRBROTHER
Of the Office of Albert Kahn, Architect, Detroit

A STUDY of the general characteristics of automobile sales and service buildings, with some consideration of suitable arrangements for sales and stock rooms, is contained in the first part of this article published in the August number of THE ARCHITECTURAL FORUM. The portions of the building more particularly concerned with the sales part of the business have been considered and we come to the other portions devoted to the uses which we call service.

The most important service portion of the building, if of the type where cars are received for adjustments and repairs, is the garage. A part of the ground floor of nearly every building where automobiles are sold must be set aside for this purpose. A garage would be omitted only in cases where the building is located on a very valuable and somewhat small piece of property or else where there is such a large distributing and assembly center that it could be classed as a factory. In the former case the building could be called a sales building, but not a service building, and in the latter case it could be called a service building only by reason of its serving the local dealers of a manufacturer and not because of any direct service to the owners of cars.

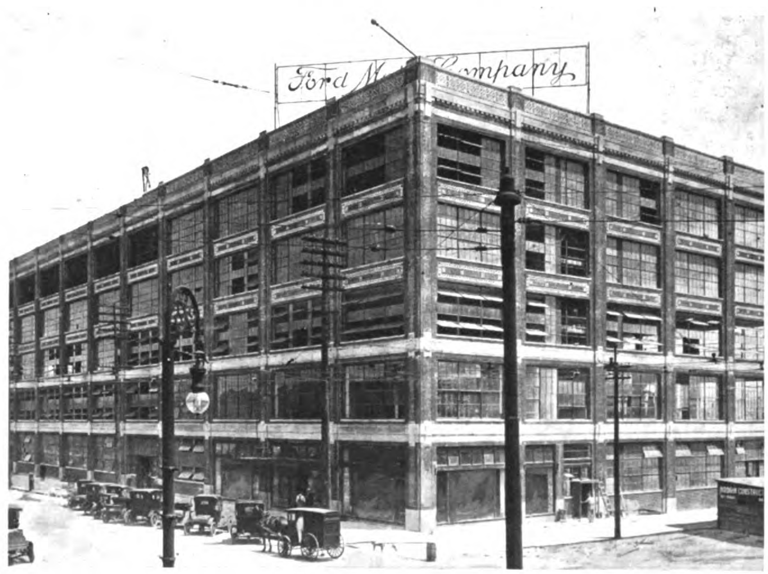
The size of the garage depends upon the size of the territory which is served. It must, of course, have entrances direct from the street or yard and, if large in area, it should have separate "In" and "Out" doorways.

The requirements that govern the arrangements of the garage are varied. If the service building is small and it is necessary that much of the small repair work and minor adjustments be made in the garage, this will require a considerable space where cars may be run in and repaired and sent out again quickly. Still other portions must be reserved as parking places and a considerable space reserved for maneuvering cars. The problem is not greatly different from that encountered in any commercial garage except that it is not likely that cars will be taken in for day parking.

In most cases the first of the large service stations built by the automobile manufacturers had large ground floor areas reserved for garage purposes. In the case of perhaps the largest manufacturers of motor cars in this country the space devoted to this purpose has grown steadily smaller as the selling, and consequently the need of caring for their product, has been placed in the hands of smaller dealers, until at the present time the garage provides only enough space for the employes' cars. The space formerly used for the garage is now used for the storing of the day's grist of new, assembled cars which are driven away over the roads or otherwise shipped to the stations of the dealers.

The first floor plan of the Ford Motor Company's building in Omaha, Fig. 6, shows a service building where considerable space was set aside as a garage. In this building the garage space has practically been done away with.

The garage is the place where the customer brings his troubles and it must be arranged in such a way that the sympathetic attention of the service man is readily obtained and the troubles easily taken care of, if of a minor nature fixed up expeditiously or, if of a more serious sort, some action started to relieve the difficulty. Indifference and inattention to the needs of a perhaps worried or excited customer will quickly breed dissatisfaction and will belie the name of the sort of building we



Building for the Ford Motor Company, Omaha, Neb.
Albert Kahn, Architect

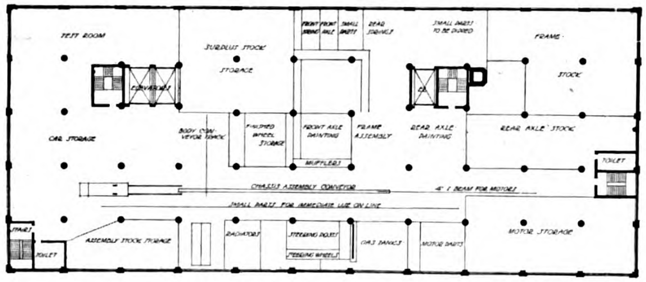


Fig. 9. Third Floor Plan

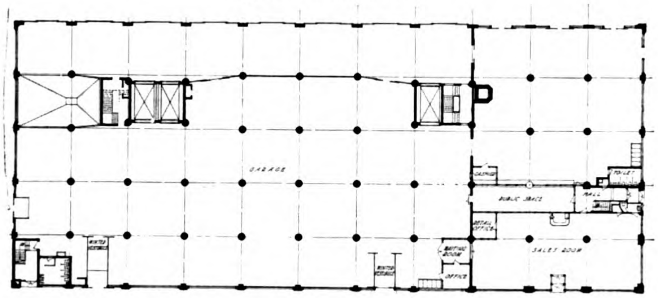


Fig. 6. First Floor Plan, Ford Motor Company, Omaha, Neb.
Albert Kahn, Architect

are discussing. Real service should be given here.

An enclosed room should be provided for the garage superintendent where the business of the service department will be directed. Some space in this office, or in an adjoining room, may well be provided where customers can sit down quietly with the service men and talk over their troubles and decide what is to be done in the way of repairs and adjustments. Provision is frequently made in some of the buildings, especially those handling high class cars, for a locker room where customers leaving their cars for repairs may lock up their robes and other valuables.

It is well to arrange that sparking devices of any sort, such as battery charging units, forges, etc., be kept somewhat remote from the garage spaces. These particular features will be touched on later.

Some provision is required for wash racks where customers' cars can be washed and put in shape before being delivered or where cars can be groomed before being placed on the show room floor. Where the garage floor rests on the ground a mere depression in the floor with a sump or floor drain at its lowest level makes a very satisfactory arrangement for washing cars. Where the wash rack is on a supported floor it should be surrounded by a curb and drained from a floor drain fixture into a separate sump or sand catcher basin to separate dirt and grease from the drainage water before it passes into the sewer.

Ventilation of the garage is necessary at certain seasons of the year if there is to be any attempt made to provide comfortable working conditions for employes. During cold weather, when all openings are closed and gases of combustion cannot readily find their way out through open doorways or windows, some means should be provided for removing them. In many cities the laws require that exhaust connections be provided for this purpose. These are arranged for by means of pipes or ducts brought down to a point near the floors and equipped with a flexible hose connection on the end of each branch. These connections are arranged so that cars being tested or tuned up may be linked up with the ventilating system by slipping the flexible hose connection over the exhaust pipe on the car, the fumes of gas thus being drawn away.

This arrangement is very good and should be the most satisfactory way of meeting the difficulty but it is found that the simple act of connecting the flexible hose to the exhaust is too much trouble for the average workman, who evidently prefers to work in a cloud of gas fumes in spite of the fact that it impairs his health and efficiency.

Another good plan consists of a suitable arrangement of ducts running along the wall or ceiling with branches dropped down at the proper points to draw the heavy gases from the floor. This plan is good for the reason that it is not dependent for its efficiency on couplings made directly between the pipes and the exhaust from the cars. Scuppers located in the walls near the floor level are a help in that they provide a

Entrance Ramp in Overland Building

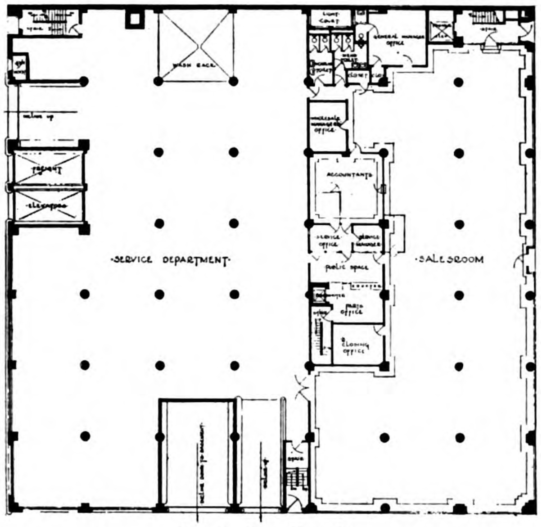


Fig. 7. First Floor Plan

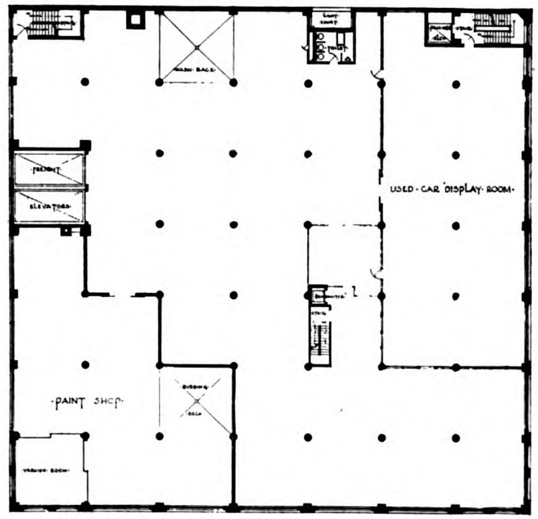


Fig. 8. Second Floor Plan

means by which heavy gases can flow out, but they should be provided with some sort of dampers to prevent the winds reversing the desired flow of gas and spreading it about the building.

If the ground area available is large and the land not too valuable it is quite possible that all the various features of the typical sales and service building can be provided on one floor level. This doubtless would be the best possible arrangement and would do away with the necessity of elevators, stairs or ramps. But this condition is the exception to the rule and we find that the majority of service buildings are of more than one story and, therefore, require that some of the departments be located above the ground floor.

These departments would naturally be those where rather extensive repair work is done and, in addition, would include the spaces where cars are assembled, if that sort of work is done in the building at all. Such space as is devoted to the storage of cars might also be on an upper floor.

The size of the repair department and machine shop will depend somewhat upon the character of the car which is dealt in, as it is certain that some cars require more repairing than others. It will also depend upon the size of the territory covered. The space must be determined by a study of the dealer's requirements and the number of repair jobs which he usually takes care of during a day. The parking space for repair jobs should be arranged against good light and in front of a bench which extends the whole length of the department.

A cleaning tank is a desirable feature in connection with this department and in some cases has been placed at the end of a trolley beam extending along the ceiling and located over the front part of the cars below. This allows for the heavier portions of the cars, such as motor parts, being

Building for Willys-Overland Company, St. Louis, Mo.
Mills, Rhines, Bellman & Nordhoff, Architects

lifted off and cleaned by dipping them into the tank. The trolley beam, of course, is useful for other purposes as well.

The machine shop should adjoin the repair department and if the whole department is at all remote from the stock room, a small separate tool crib will be desirable. The machine shop need not be large, as standard replacement parts are usually available. In most cases a lathe, drill press and grinder are required and often a babbitt pot. It should be noted that this latter is sometimes classed as a sparking device and is, for that reason, regarded by some building departments as a fire hazard and must be placed in a separate room not too far away. Sometimes the forge room must also be placed elsewhere, possibly with an entrance through a vestibule or other suitable passage open on one side to the outer air, somewhat after the customary arrangement of entrances to smoke tower stairways. In many cases the requirements are not as stringent and a curb, say six inches high, across the entrance to the room is sufficient.

The spacing of cars in the repair parking space will depend upon the spacing of columns but it may be assumed that eight feet on centers for ordinary cars is about as close as they can be spaced for repair work. For working on trucks the spacing should be greater. Where building columns are located say 25 feet apart it should be possible to work on three pleasure cars or two trucks in each bay.

Repair pits are not in such general use now as they were in the past. Besides cutting up the floor construction, they have been found to be a source of danger. Where they are required, however, it is sometimes possible to arrange an opening in the floor and provide a suspended cage below the opening which has a wire screen enclosure around

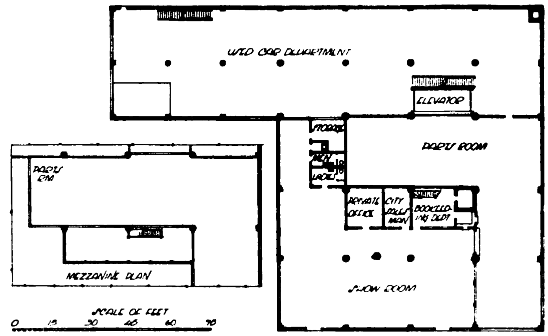


Fig. 11. Building for Perry Motor Company, Kansas City, Kan.
Hoit, Price & Barnes, Architects

the sides and enough openings to afford means of escape in case of fire. An open arrangement of this sort will eliminate the danger of workmen being overcome by the accumulation of heavy gases.

A battery room where tests can be made and batteries charged is usually required. In some cities this will have to be arranged in a separate room with an open air entrance if it is on the same floor as the garage. Usually, however, no precaution is necessary other than arranging that no sparking connections be located nearer than four feet from the floor, or else the provision of a curb at the entrance to the room similar to that often required for the forge room.

A certain amount of service work will consist of painting and varnishing and separate spaces should be arranged for these departments. The rough and the finished painting work can probably be done in the same enclosed space but it is well to have the varnish room separate and arranged so that it will be as free from dust as possible. A rubbing deck will be required for the painting and varnishing departments which should be well drained.

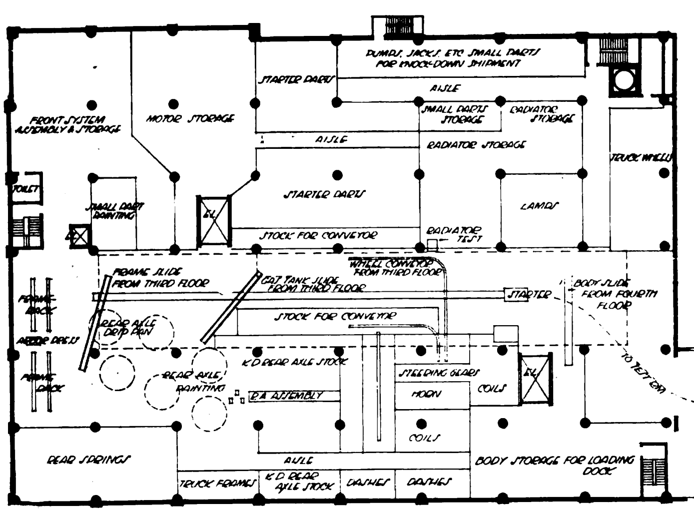


Fig. 10. Second Floor, Building for Ford Motor Company, Chicago, Ill.
John Graham, Architect

If a considerable amount of enameling is done, as will be the case where cars are assembled, and parts such as fenders, bonnet covers, etc., are shipped in, nested and crated separately, there should be enamel baking ovens, and vents will be required. While such vents can be carried up through one or more stories, it would naturally be more convenient to locate the ovens on the top floor. This would suggest the placing of the enameling, painting and varnishing rooms together on the top floor where they would be free from dust. Varnish and drying rooms should be heated to a temperature of 80° Fahr.

If space on this same floor is available it would be convenient to locate the upholstery shop here, but as this department is apt to be dusty it should be separated from the car painting sections by dust-proof partitions.

The problem of storage space for automobiles deserves considerable attention. In numerous cases distributors have been compelled to rent space in various places to take care of the cars at certain times of the year. One case is on record where a distributor, who was contemplating the erection of a new building, had cars stored in rented spaces in five different places. Usually ground floor space is too valuable for storage but in cases where a basement is provided, it may be used for this purpose satisfactorily. If the storage space has a reasonably high ceiling it may be possible to store cars in two tiers by providing inserts in the ceilings from which the cars may be suspended by cables or by constructing a steel framework having angle iron tracks on which cars are placed upon the suspended framework by means of a traveling transfer platform. Both of these arrangements have been used in the service buildings of the Willys-Overland Company, designed by Messrs. Mills, Rhines, Bellman & Nordhoff.

Inclined ramps have been used in a considerable number of recent city garages and to some extent in sales and service buildings. They afford an inexpensive and easy means of passage from floor to floor, but require considerable room. Where it is not necessary that cars be handled with speed it is quite probable that elevators will suffice.

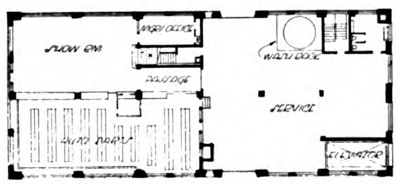
Ramps giving access to both the basement and first floor of the Willys-Overland Company's building in St. Louis are shown in the plans of this building in Figs. 7 and 8. This arrangement gives easy access to these two floors and relieves the elevator considerably but it would evidently use up too much room to extend them to upper floors.

A 10 by 20 elevator platform will suffice to handle any pleasure car. If trucks are handled in the building the platform will have to be longer and perhaps wider. It is the practice of one of the manufacturers of large passenger cars, who also makes trucks, to provide elevator platforms 12 feet wide and 30 feet long and in some cases even 35 feet. The longer platform will accommodate two passenger cars. An example of an elevator platform wide enough for two cars abreast is seen in the plan of the service building for Mr. C. C. Coddington, Fig. 5, in the first part of this article.

The location of the elevators is very important and considerable study will be required to place them in the best positions. They should be located, when possible, adjacent to the main aisles on all floors, but often it will be desirable to place them against outside walls that they may be entered from the street or yard, thus avoiding considerable traffic through the ground floor.

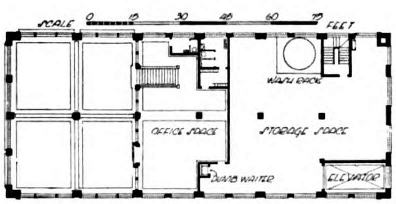
Regard should be paid to the ease of turning off or on to the elevator platforms. Service men say that it should be arranged as far as possible that cars can be driven head on to or from them instead of being backed on or off, especially if cars are driven to or from the elevators by anyone other than the employes of the station.

Numerous arrangements of elevator doors and gates are used and it is difficult to tell which scheme in the long run is the best. The most common arrangement is to provide some sort of a fire curtain at each floor and a smaller gate on the inside of the opening which will slide up out of the way when the car is at the floor level. The greatest disadvantage of this plan is that the elevator shaft is always open and heat from the lower stories is very apt to find its way to the top. The elevator shaft openings may be equipped with solid



Second Floor Plan

Third Floor. All Work Space



First Floor Plan

Fig. 12. Ford Agency for R. P. Rice, Kansas City, Kan.
Smith, Rea & Lovitt, Architects

doors which will be heavier than the gates just mentioned, but which have been found to work satisfactorily. Both the gates and the solid doors should be provided with some form of mechanical operators. The ordinary type of full automatic gates which lift and fall every time the elevator platform passes a floor are too cumbersome for the usual freight elevator.

A lifting capacity of 10,000 pounds is as great as will be required for any building unless especially heavy trucks are to be handled. Usually a lesser capacity is sufficient. The speed will vary with the number of floors to be served, from 50 to 150 feet per minute being about the usual range.

In many cases it is customary to extend the freight elevator to the roof, thus giving an open air space where engines may be tested and tuned up. When the roof is used at all extensively some durable paving should be provided on top of the composition roofing.

The proper spacing of columns for the most convenient use requires careful consideration. It is found that the ideas of different service building owners vary as to what is most suitable. While the size and shape of the property will influence the natural widths of the bays it is desirable that the spacing be adjusted to allow of parking cars between the columns without waste of room.

The kind of car to be used will have a definite bearing on the space required. While the overall width of the largest passenger car is not much greater than the smaller, the radius for turning of the larger cars is considerably greater and this must be taken into consideration in determining what is best.

A spacing of 23 feet 6 inches in width works out very well and will allow of parking large pleasure cars and still leave plenty of room for getting in and out. A length of 16 feet, approximately, is required for parking. The width of aisle will vary with the length of the car to be accommodated but 28 feet between column centers will prove an ample space for maneuvering the largest passenger cars or trucks with ease. An aisle between columns 20 feet on centers is nearly the minimum.

In some cases it has been found that the equipment to be installed in the building, such as motors, trolley beams, sleeves, etc., can be laid out in advance and the proper bolts for supporting them can be placed in the floor or ceiling construction when the concrete is poured. But in most cases it is better to provide some system of threaded or slotted inserts placed at regular intervals to support equipment which may be placed. These inserts can be used for supporting pipes. It will be necessary to provide a system of compressed air piping and a compressor in practically every building. Outlets for tire inflation and numerous other purposes may be provided wherever required.

Gasolene and lubricating oil storage is regulated by law in different cities. The rules governing installation vary greatly and it is necessary to consult the codes to find exactly what is allowed. Some cities will allow tanks buried beneath the floors of the building and some will insist that tanks be placed at a distance or under the sidewalk. The amount of gasolene which it is permissible to store also varies. If the building is large and possesses a railroad siding it may be possible to provide one or two large tanks sufficient to hold somewhat more than the standard railroad tank car. The quantities of gasolene which different service stations require will range from the large tank capacity to the amount which can be contained in the portable gasolene buggies used in the smaller garages. For the average service station, say one with 35,000 square feet of floor space, two one-thousand gallon tanks should be ample.

The quantities of lubricating oil which it is desirable to keep on hand will likewise vary and unless a very large amount is required it can be handled very well by providing some sort of cradles on which oil drums can be placed and equipped with a barrel lift over the top for convenience in handling them. It will be found a good scheme to provide a sort of curb around the gasolene pumps or oil barrels to keep the drippings from spreading around the floor.

Pumping stations can usually be arranged so that gasolene can be drawn by direct suction to points on the first floor of the building provided the pull is not much over 12 feet in localities near sea level. When it is desired to raise it to upper floors it will either be necessary to arrange the pumps so that they will occur directly over the suction valves below and the gas raised above the suction valves by a direct lift, or else to install a pressure supply system delivering gasolene according to measure at the outlets. The latter system is somewhat more expensive but, naturally, more flexible.

Car assembly is an activity which is carried on to some extent in most large service stations. In most of the buildings owned by the Ford Motor Company, cars are assembled and in the large buildings bodies are likewise assembled and all the painting and upholstering done. The various parts are arranged in suitable locations to allow of feeding into the travel line of the assembly conveyor at the proper point.

The third floor plan of the Ford Motor Company's assembly and sales building in Omaha, Fig. 9, shows the arrangement of the assembly conveyor and the disposition of the stock parts to be incorporated in the finished car. As will be noted frames, rear axles and motors require the largest storage spaces on the floor. Preliminary assembly of frames and rear axles is made near the storage space and placed on the traveling conveyor at the end. As the conveyor travels along, the additional parts, such as front axle, springs, gas tanks, steering posts, etc., are secured to the chassis.

The bodies which are assembled and prepared on the floor above are brought down to the main assembly on the elevator and placed on the chassis just before it is run off the conveyor as a practically completed automobile.

From the point of assembly where the engine has been started running by a device which spins the rear wheels rapidly while the clutch is engaged, the car is run by its own power to the test room where necessary adjustments are made, after which it is taken to another floor for storage or to the yard for driving away or for shipment.

The Ford building in Chicago, a plan of which is shown in Fig. 10, was originally arranged with a craneway in the center by means of which railroad cars could be unloaded and their contents distributed to the upper floors. The feature of unloading from railroad cars by the overhead crane has been done away with in this building but the space previously used for this purpose is now used for the assembly of cars. Different parts of the cars, as will be noted by the diagram, are brought down from the upper floor on chutes or slides; wheels, frames and gas tanks come from the third floor and bodies from the fourth floor.

The plans of the building for the Noyes-Buick Company in Boston, Figs. 13 and 14, Arthur H. Bowditch, Architect, show a very complete layout of a sales and service building for a distributor controlling a large and populous territory.

In this building separate sales rooms are provided, one for trucks and one for pleasure cars, both located on the main floor. In addition is a show room located on the second floor for the display of special

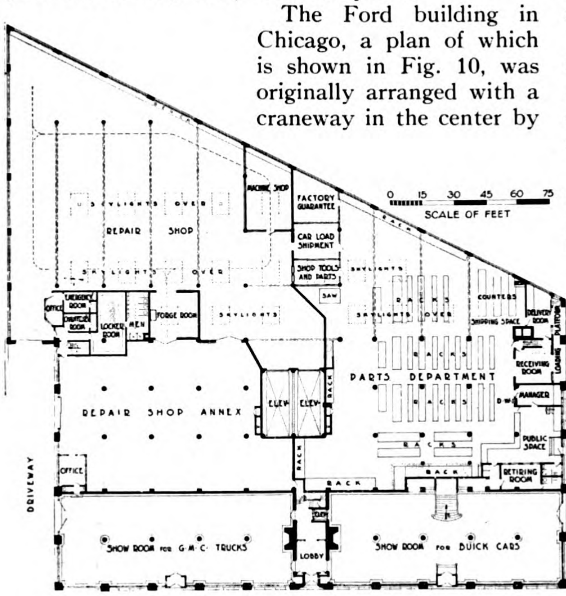


Fig. 13. First Floor Plan

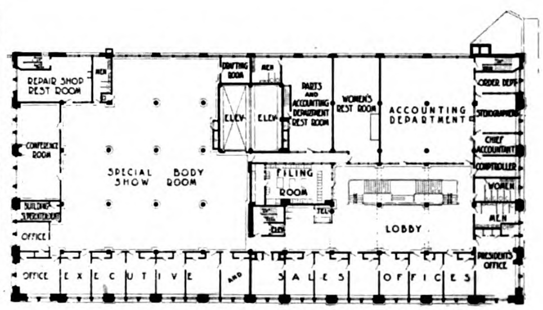


Fig. 14. Second Floor Plan

Sales and Service Building for the Noyes-Buick Company, Boston, Mass.
Arthur H. Bowditch, Architect

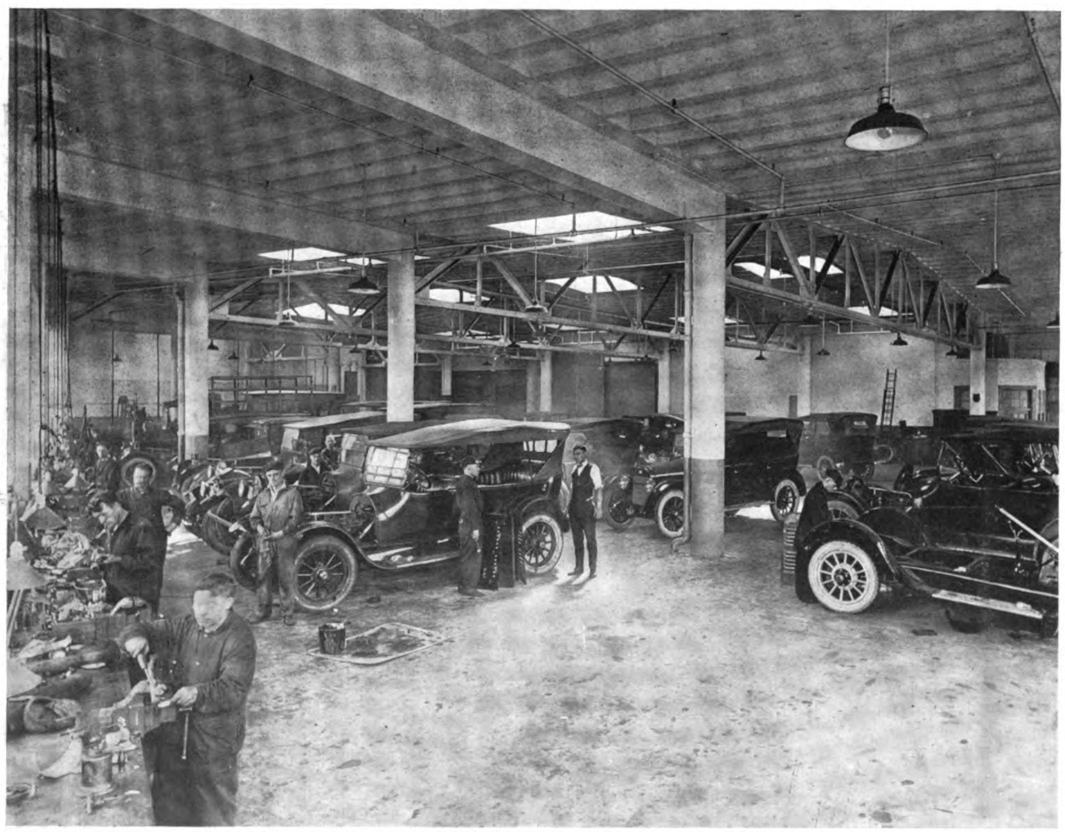
bodies. The entire basement, which is reached by an outside inclined driveway, is used as a garage where new cars and trucks are prepared for delivery. The main access to the elevators is arranged for at this lower level. The greater part of the third, fourth and fifth floors are given over to the storage of pleasure cars and trucks.

The planning of this structure, which is now regarded as the last word in sales and service buildings, embodies every conceivable convenience for patrons as well as for employes. Everything has been carefully planned for a reason. The object was to secure ample room for the transaction of business and to provide for constant expansion and also to be able to carry on the work with all possible efficiency. Every effort has been made to create agreeable surroundings for those whose work plays so great a part in the success of the business.

The buildings now under construction in Kansas City, Kan., for the Perry Motor Company, Fig. 11, and for Mr. R. P. Rice, in the same city, Fig. 12, illustrate an excellent type of service station adapted to the needs of the local city dealer. In each of these buildings the contour of the ground is such that the lower story may be used as the garage, giving the greater part of the main floor for sales room, used car show room, offices and sales rooms for parts. The upper floors are open spaces and are used for repairs, storage, etc.

The question of the arrangement of offices is entirely dependent on the requirements of the occupant of the building. For the smaller service building it is very often possible to use a mezzanine back of the show room as is done in the service buildings in Kansas City just mentioned. Where the offices are larger the usual space available on a mezzanine is apt to be too restricted and too low and the second floor or an adjoining space on the main floor is more desirable.

We have attempted to point out only the salient points of the problem and to describe them in a general way. Problems will be found to vary greatly but the different points which have been brought out, it is hoped, will be of some assistance to anyone engaged in the study of the problem of planning an automobile sales and service building.



Repair Shop in Sales and Service Building for the Noyes-Buick Company, Boston, Mass.
Arthur H. Bowditch, Architect

Early American Domestic Architecture

II. THE WELLINGTON HOUSE, NEAR WALTHAM, MASS.

MEASURED DRAWINGS BY EDWIN J. HIPKISS
(Member of Staff, Museum of Fine Arts, Boston)

DESIGNING in the spirit of any period is greatly aided by study of good examples of the work of the period being interpreted.

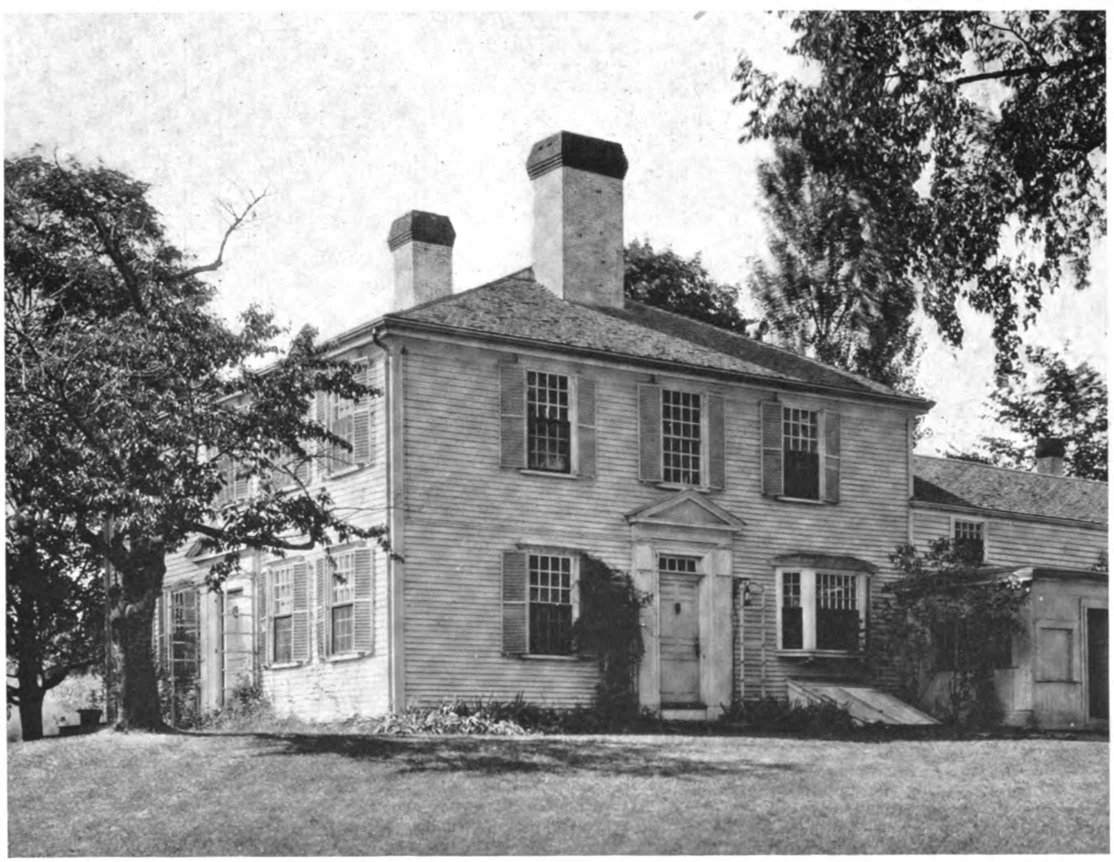
It is fortunate that notwithstanding our past indifference to noteworthy early American work and the vandalism which has destroyed so many examples, a more intelligent interest is now caring for the best work *in situ* and is garnering into museums many old doorways and mantels.

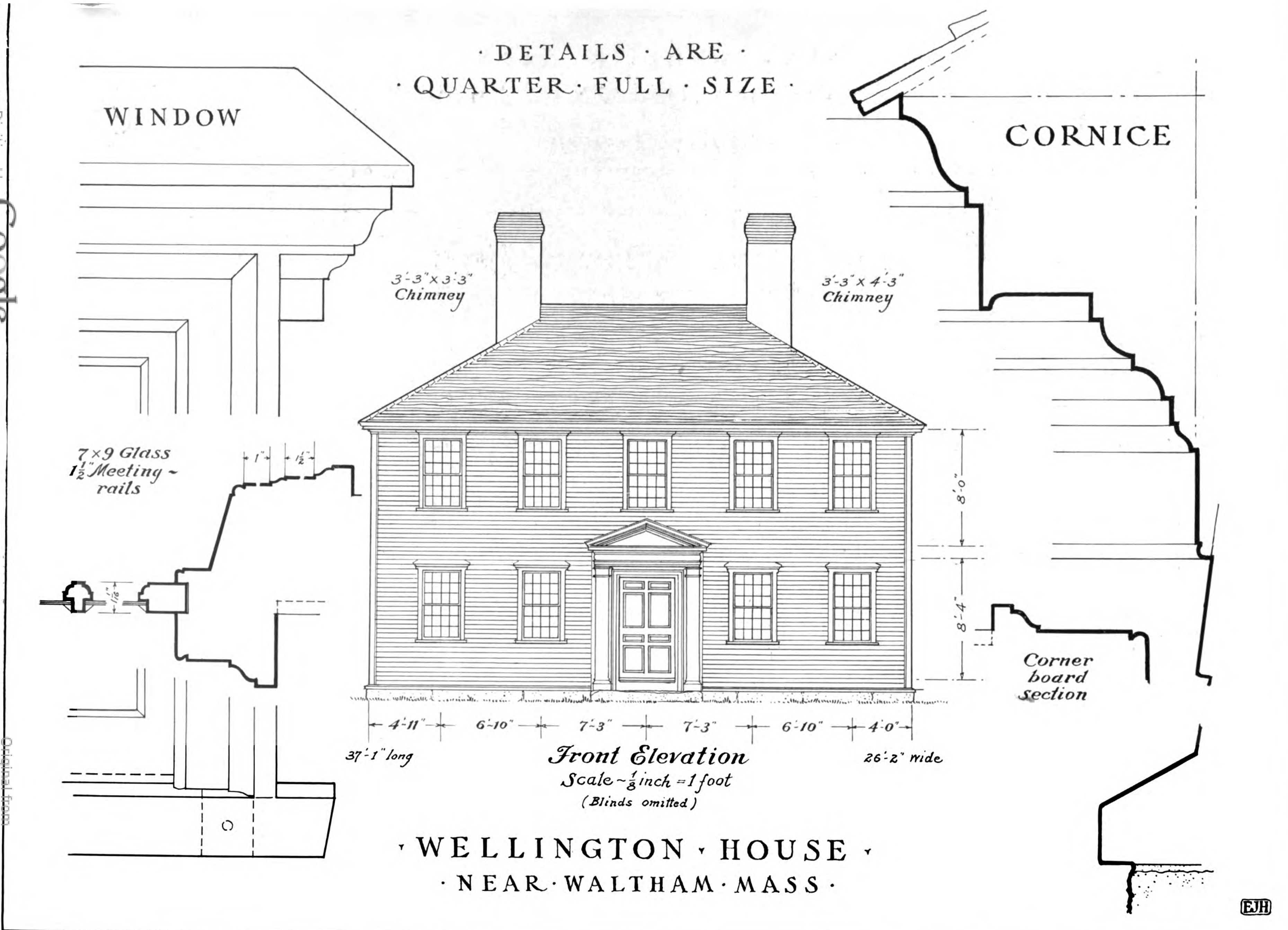
The Wellington house, near Waltham, Mass., built about 1750, affords an opportunity for the study of eighteenth century American work for, thanks to intelligent ownership, most of its old-time dignity and simplicity have been preserved. The tiny bay window shown in one exterior view is of course an architectural aberration, and the removal of the cyma of the cornice to make way for a wooden gutter is distinctly unfortunate, but both errors may be easily remedied.

Tradition asserts that the lumber for both frame and finish of the house was cut and worked into form on the property, but tradition is silent as to the designer whose eye and hand determined the scale and sequence of details which possess individuality though they conform to a type.

Architects are often puzzled to account for the excellence of design in most eighteenth century American work. We know, however, that by the middle of that period taste and building tradition had become well established. Every skilled worker in wood owned his set of moulding planes and close study reveals the simplicity of their geometrical forms. There were, in general, convex and concave quarter rounds, thumb mouldings and ogees of various sizes—the very elements of good form.

Under the Georgian influence of England this simplicity of expression took on a high quality of directness and sincerity which resulted in great excellence of work by thoughtful designers. Such work was no doubt then taken as a matter of course while it is now valued as a matter of American art.




· DETAILS · ARE ·
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WINDOW
CORNICE
7×9 Glass
1½" Meeting-rails
1"
½"
1⅛"
3'-3" x 3'-3" Chimney
3'-3" x 4'-3" Chimney
8'-0"
8'-4"
Corner board section
4'-11"
6'-10"
7'-3"
7'-3"
6'-10"
4'-0"
37'-1" long
26'-2" wide
Front Elevation
Scale ~ ⅛ inch = 1 foot
(Blinds omitted)
· WELLINGTON · HOUSE ·
· NEAR · WALTHAM · MASS ·
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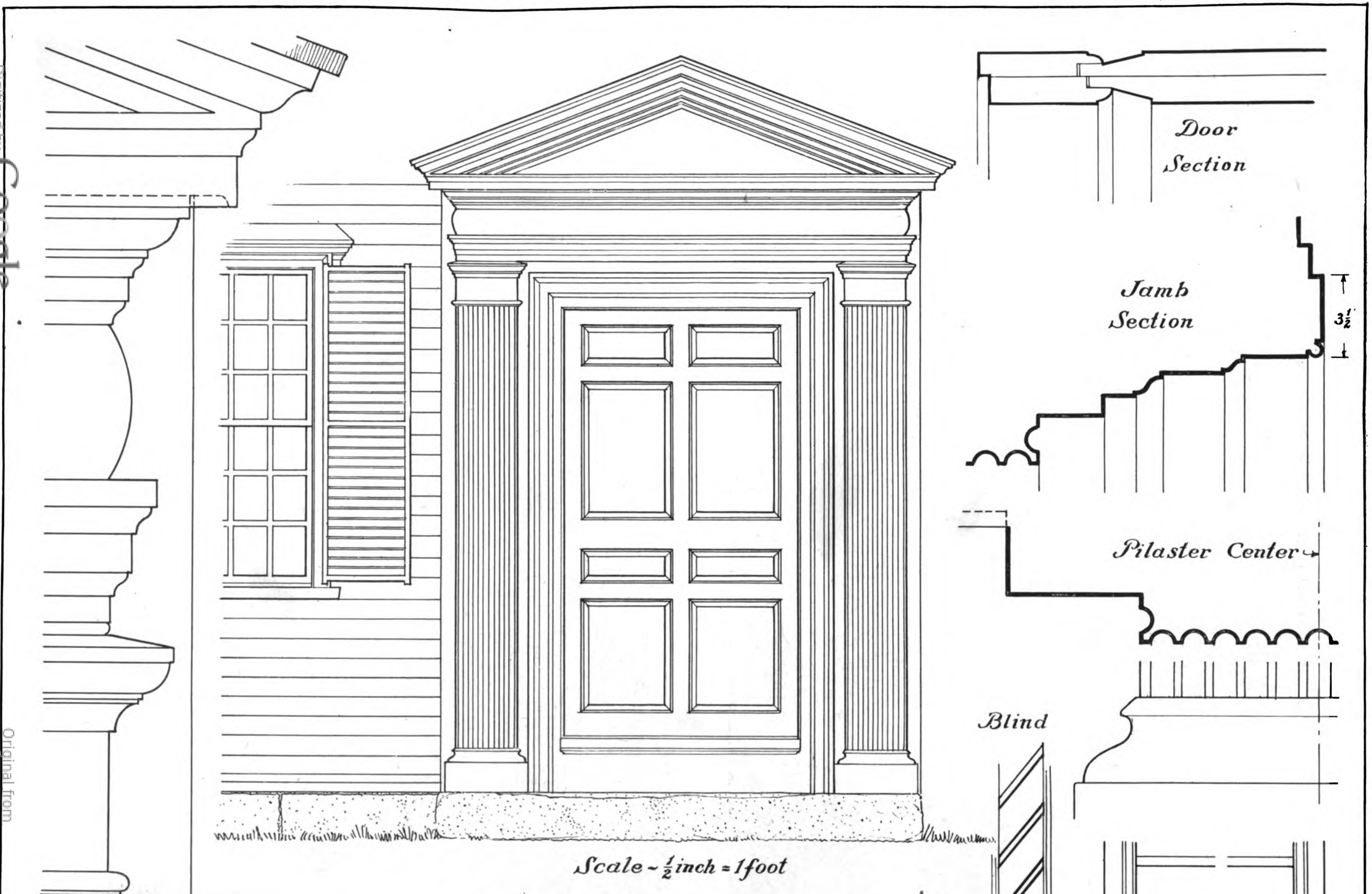
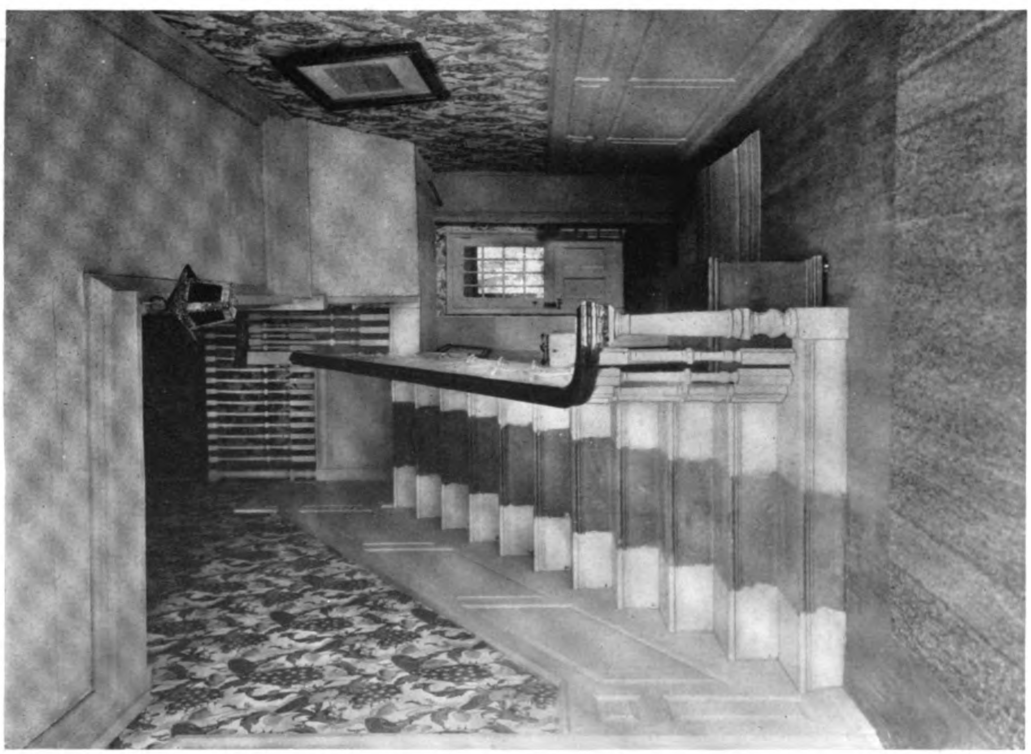


WELLINGTON HOUSE
NEAR WALTHAM MASS

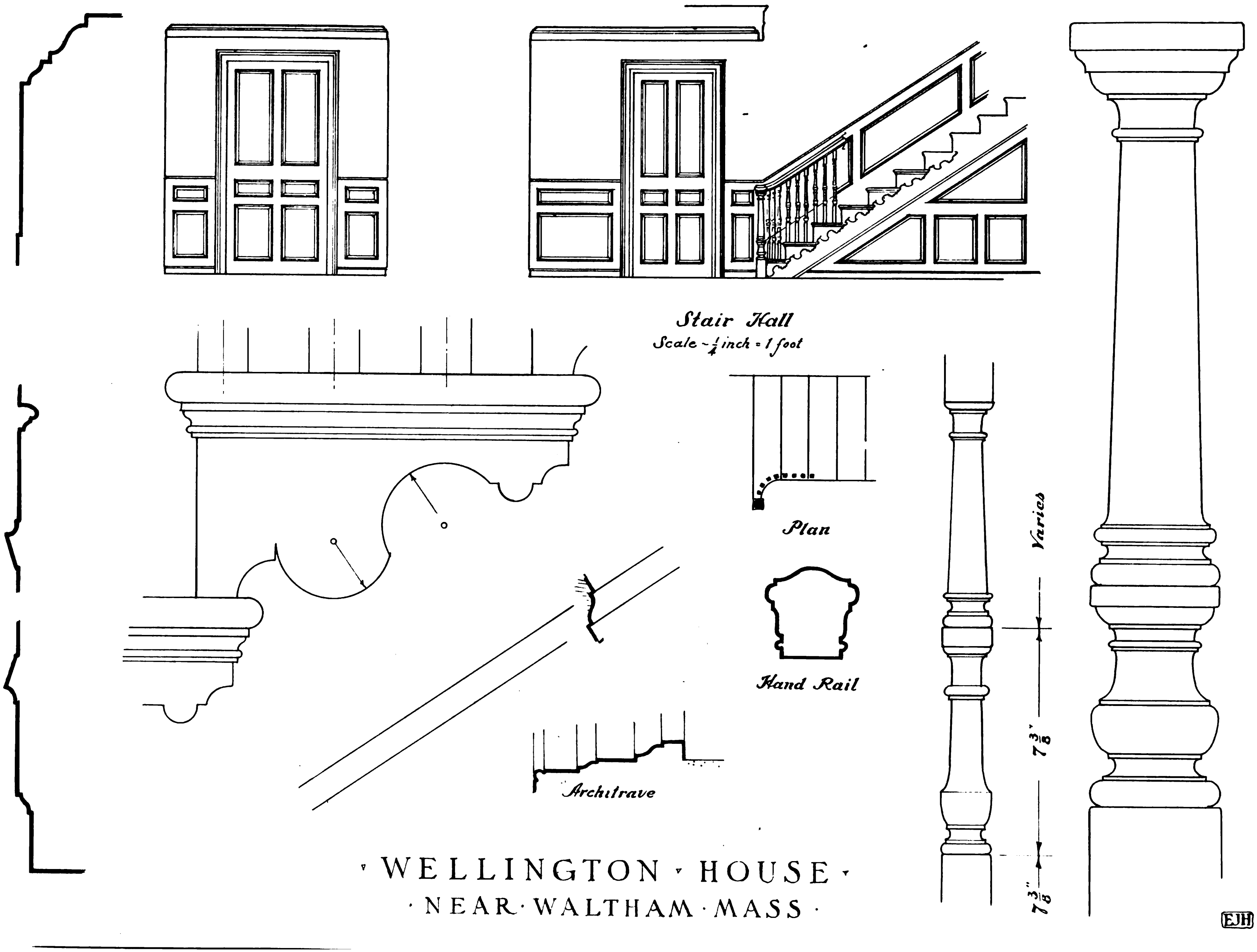


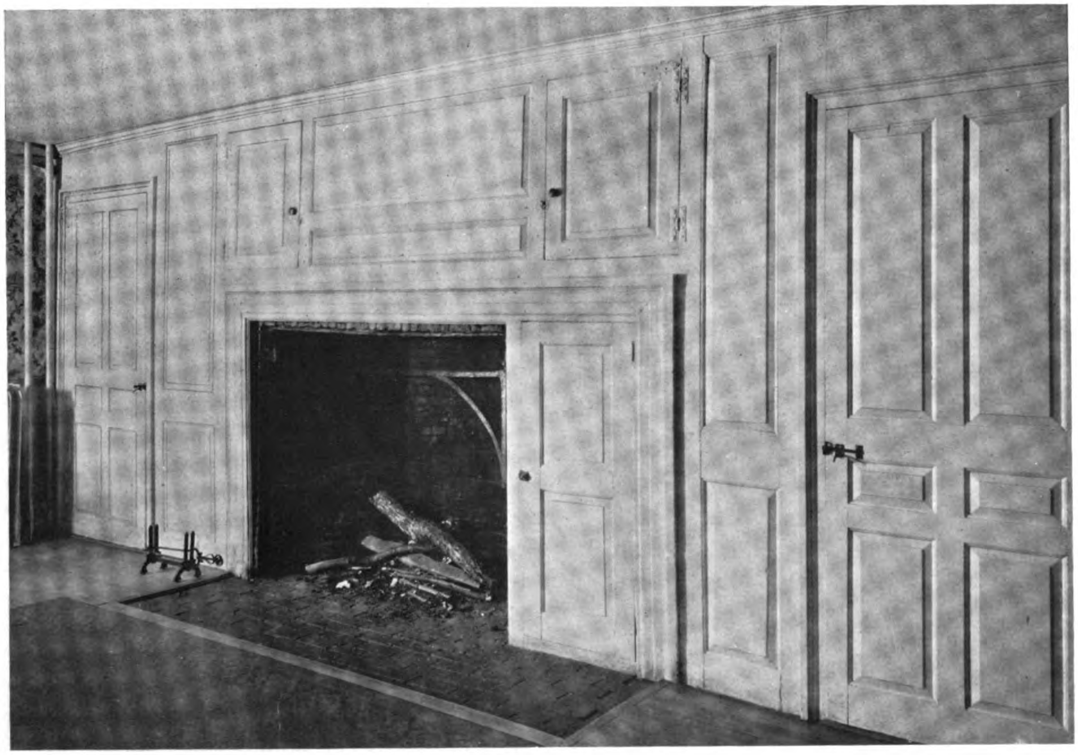
STAIR HALL

MAIN DOORWAY

WELLINGTON HOUSE, NEAR WALTHAM, MASS. BUILT ABOUT 1750

WELLINGTON · HOUSE
NEAR · WALTHAM · MASS

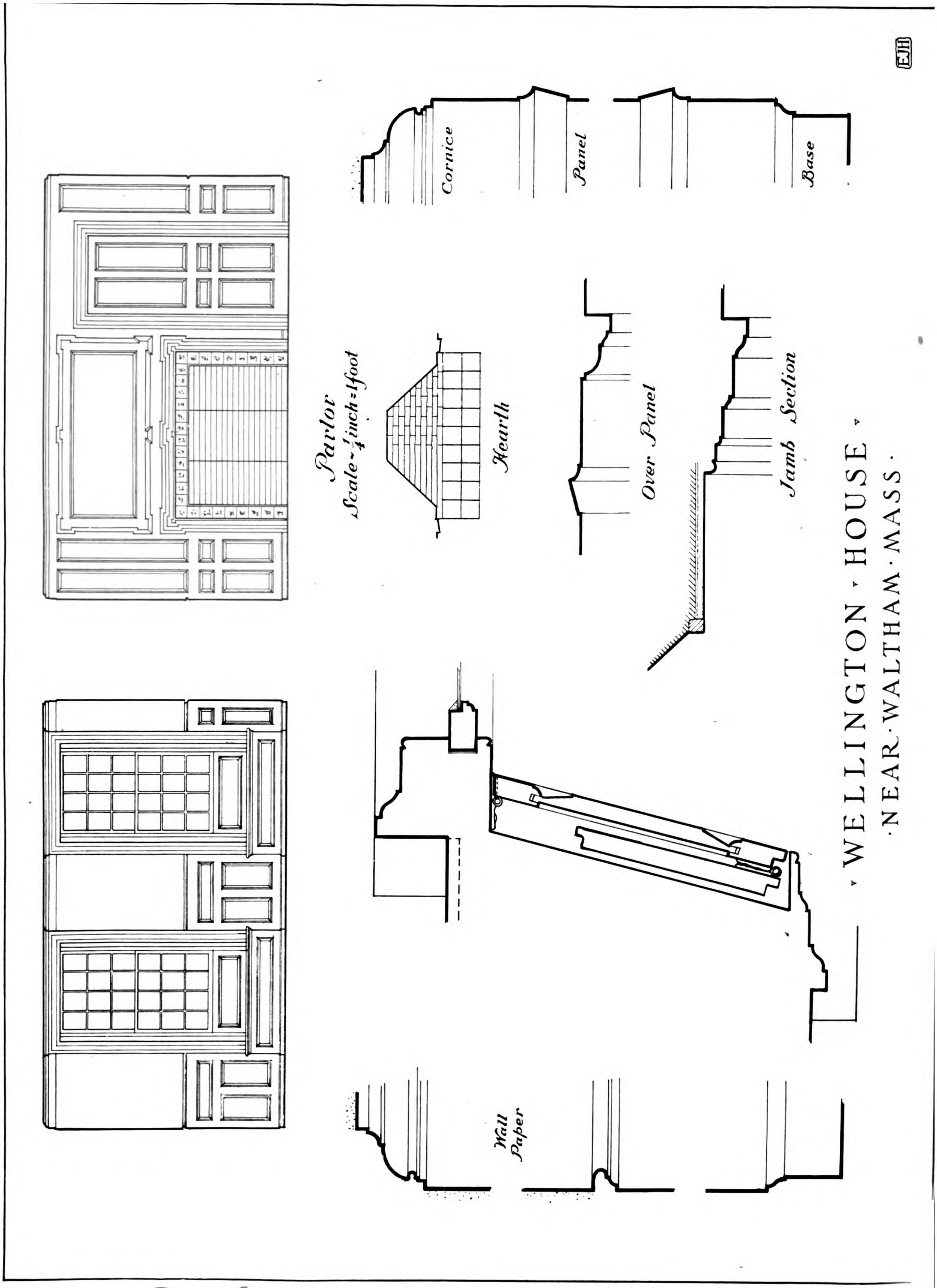




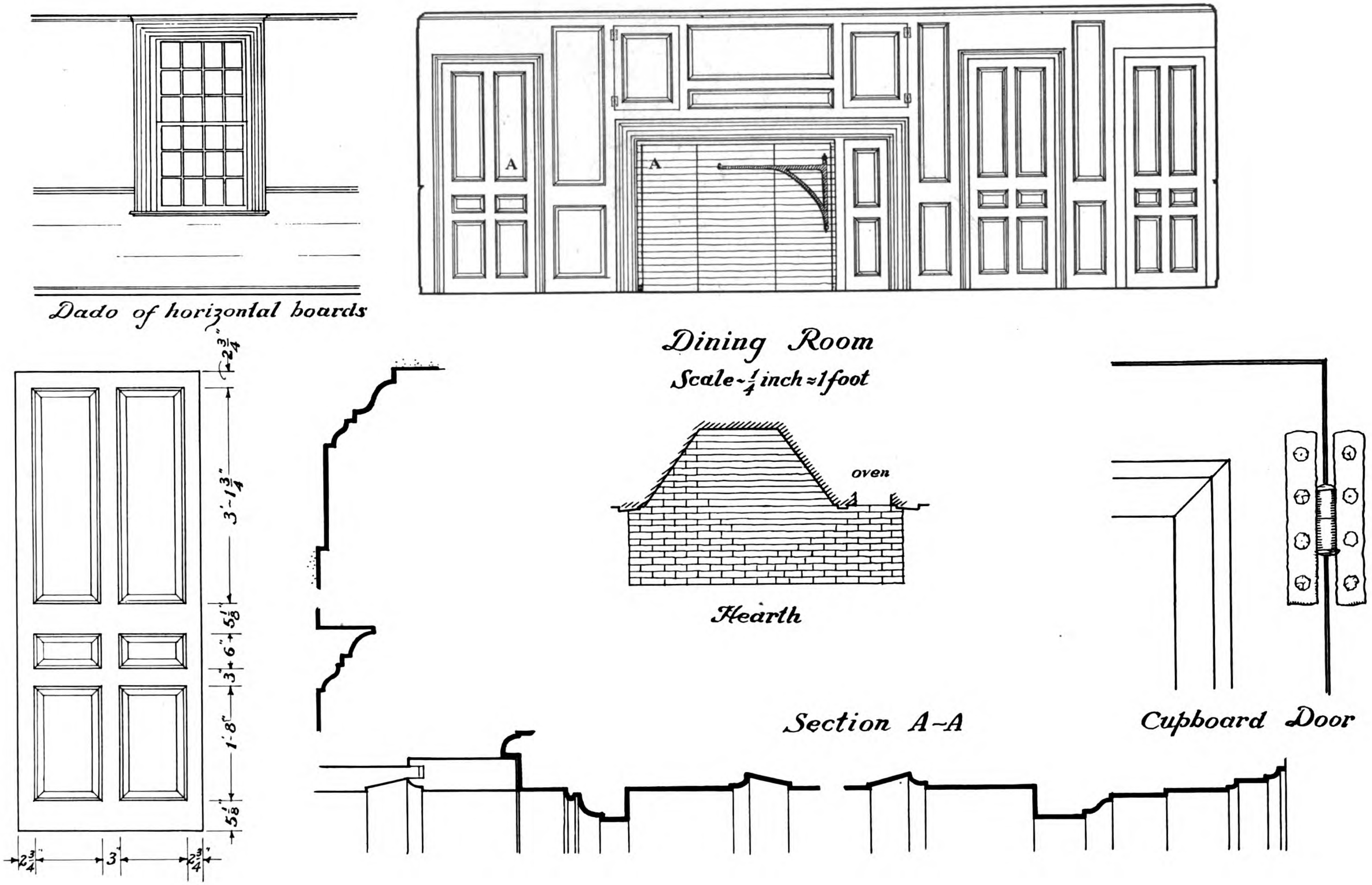
DINING ROOM MANTEL

PARLOR MANTEL

WELLINGTON HOUSE, NEAR WALTHAM, MASS.



·WELLINGTON·HOUSE·
·NEAR·WALTHAM·MASS·
Parlor
Scale ¼ inch = 1 foot
Hearth
Over Panel
Jamb Section
Cornice
Panel
Base
Wall Paper
EJH



· WELLINGTON · HOUSE ·
· NEAR WALTHAM · MASS ·

The Development of Architectural Practice through Local Co-operation

MUCH has been said and written during the past few years regarding the use of publicity by the architectural profession. Many recommendations have been made, some of a very practical nature, and it would seem to be the consensus of opinion that there is no ethical reason why architects should not advertise. But in spite of this fact there seems to be little activity in this method of promoting practice. It remains, therefore, for constructive suggestion to be made, and to outline one method of activity which should not only assist in developing local practice, but should have the added value of community benefit.

Briefly, we have in mind the possibility of forming local groups of architects co-operating to produce general publicity which will promote in the public mind a better conception of the value of architectural service, both to the individual and to the community.

In traveling through various smaller cities and towns of the East and middle West, particularly in industrial centers, it is amazing to note the lack of architectural merit in the designs of dwellings, small store groups and other smaller types of construction. Naturally, many comments have been made regarding such conditions, but it is also evident in starting new construction that very little progress is being made in impressing owners and communities as to the value of architecture applied not only to the design of individual dwellings, but in relation to unity of mass, which is so lacking even in the newly constructed residential and business sections of our cities and towns.

We may refer for instance, to the great volume of dwelling construction which has been recently carried out in Detroit and other Western cities. In Detroit many millions of dollars have been spent in the construction of so-called duplex houses, which are in reality two-apartment houses. Thousands of buildings of this nature have been constructed in Detroit in the last two years, and the average cost has been from $16,000 to $30,000. Of all these buildings not one-half of one per cent possess any architectural merit. The houses are constructed on narrow lots, the average allowance between houses being simply space wide enough for an automobile driveway. To the fact that land values are high may be attributed the general use of small lots.

Upon inquiry regarding the lack of character, variety and mass unit in these buildings, it was found that very few of the houses were designed by architects,— at least for the type of location in which they were placed. These houses are built usually from stock plans developed by builders, and while they may include every practical comfort for living, they are usually devoid of that attractiveness which is evident in an artistically planned building.

It is a safe estimate that in one year $40,000,000 worth of construction of this type has been carried out in Detroit, in which work architects have received no consideration; nor has the community benefited in proportion to the possibilities. In making inquiry as to real estate values it was found that in certain blocks where houses of good design had been constructed the appearance of the entire block was better and consequently real estate values were higher, as a definite character had been given to that locality.

The development of really good stock plans for homes which has been carried out through various manufacturers' associations and through the activities of certain publications has had beneficial influence on the modest cost domestic architecture of the United States. The fact, however, that a very large percentage of this construction is carried out without the services of good architects is plainly evidenced in a study of new building developments of a residential character.

The same criticism may be made of store blocks, usually two stories in height, containing space for several stores and possibly residential quarters for storekeepers' families. Here and there one may see a new store block which has character and consequently attractiveness. Casual inquiry seems to show that in blocks of this kind store rentals are higher, not because cost of construction is higher, but because atmosphere has been created.

The public at large, and particularly the building public, has no mentor to point out the basic reason why certain houses or certain blocks are more attractive. There is no simple manner through which appreciation in the public mind is being developed regarding the fact that the more attractive units or sections of the community are those which have received architectural study. Consequently, as millions of dollars are being spent in the development of new homes and smaller buildings of various types, there is not an increasing percentage of this work coming under the control of trained designers.

It would seem logical, therefore, that under normal conditions, and particularly in smaller communities, definite co-operation could be carried out among local architects to enter into a campaign to develop public appreciation of the value of their work,— not only in its value to the individual, but from a community aspect. As we enter the smaller industrial towns where the business section is made up usually of one main artery consisting of one block with offshoots extending into the side streets, we are amazed by the haphazard and unattractive development of these blocks. Here enters not only the question of city planning, but the possibility of an art commission, even in a small town, which, to a certain extent, could control the designing of groups of buildings of a semi-public nature. Certainly much improvement has been developed in residential sections through the medium of restrictions regarding setbacks, sizes of lots, etc., but in the more closely built up sections where real estate values are high, we cannot look to landscape architecture as a means of promoting better design. We must look directly to architecture, particularly in neighborhoods where houses such as the Western duplex houses are in danger of developing into monotonous and unattractive rows.

Through the activities of a committee or group of local architects there is no reason why certain funds should not be raised and expended in developing public appreciation in order that prospective builders of homes and smaller building groups may be induced to at least give consideration to the possibility of using good plans, both from an artistic, community and real estate valuation viewpoint.

Not long ago the directors of the New Jersey Association of Architects were considering a proposition of furnishing plans and designs for inexpensive homes at special and reasonable rates. Other groups of architects have given some consideration to this idea, but in view of the fact that practically every home built from such plans would normally not be planned by an architect, it would seem that co-operation in the preparation of plans would constitute a valuable feature for local application. In fact, this might be a means of publicity.

Suppose a group of local architects were to prepare a number of attractive house plans and offer them to prospective builders in the community at a comparatively low cost. Certainly there would be considerable publicity not only for the architects who entered into such an activity, but for the idea of bettering residential design, and this spirit, once established locally, would result in practical elimination of ugly stock plans and the untrained conceptions of the average builder.

To the lay mind, in considering the construction of an inexpensive home the services of an architect mean added expense. If, however, the architect be of practical mind, he will usually be able to produce a design involving additional features which would more than offset any charge which he might make for the work.

The possibilities of local co-operation among architects for the public benefit as well as the development of their own practice are so great that it is difficult to describe in a brief article the activities which might be undertaken. The home-owning public is always interested in an activity which tends to improve home surroundings or to increase or stabilize real estate values. The speculative builder is ready to be impressed with the value of improved design if some one is willing to undertake his education, and to show him that a well designed house is more saleable. From the viewpoint of community improvements there is no doubt that newspapers would be glad to co-operate in a campaign for the betterment of individual dwelling and community architecture.

Through the activities of such an organized group of architects real estate developers could be induced to avoid common errors in locating dwellings on subdivisions. With a studied campaign of education carried out along simple and dignified lines of community benefit there can be no doubt that a very large percentage of money to be expended for building construction in the community would carry an architect's commission.

In isolated cases some effort has been made in this regard, but as yet there has not come to our attention any well defined local co-operation among architects tending toward the accomplishment of the purposes as outlined here. We are much interested in receiving information from architects regarding the feasibility of the use of publicity in the way indicated.

There is no doubt that the chamber of commerce in the average town would co-operate in activities of this nature. Usually the architect is not a progressive member of the chamber of commerce, even though every other line of effort in the community which depends upon public demand for its support enters actively into co-operation, both for community and individual benefit.

There is no doubt that architects have been somewhat lax in at least one respect,— that is, in waiting for prospective builders to learn, through one manner or another, appreciation of the practical, artistic element in the preparation of building plans, and consequently awaiting calls for their services. In other lines of activity demand for services is definitely developed by some more or less scientific plan of publicity.

No serious obstacle can be foreseen which might preclude co-operative activity of this nature on the part of local architects. The actual division of the work would naturally be left to individual selection, but it is certain that if the demand for architectural services can be increased through the development of public appreciation, there would be more work to go around, and consequently more work for the individual architect who may lend his aid in establishing a better public appreciation of the practical methods of architectural service in the design of dwellings and structures housing business dependent upon the support of local trade.

Applying the Co-operative Method of Financing to Inexpensive Types of Apartment Buildings

AS interest in the idea of co-operative apartment house financing is becoming national in its aspect, it is but natural that this interest should take definite form in a consideration of the possibilities of applying the co-operative idea to the financing of moderate cost apartment houses. The great wave of co-operative financing of apartment houses and office buildings which has found its center in New York has, to a certain extent, been developed in high cost buildings; but in view of the number of inquiries in regard to this question, it will undoubtedly interest architects and speculative builders to know that there is no reason why the co-operative method of financing should not be applied to less expensive types of buildings. In fact a number of such buildings have been recently developed in and near New York, and while sufficient time has not yet elapsed to determine the ultimate success of the proposition this method has been successful to the point of making it possible to design a number of buildings.

The basic elements of co-operative building ownership do not preclude the application of this principle to moderate cost buildings, except in the limitation of promoters' fees. In fact it might be said that as the inducement to the promoter is greater in developing high cost buildings it is but natural that real estate activity of this kind should be directed chiefly toward the promotion of the more expensive types of apartment dwellings. Possibly this is why the co-operative plan has been applied, in most instances, to costly developments.

On the other hand, there is a great need of studied application of the co-operative principle in the development of apartment units costing in gross figures not over $8,000 per family. In order to give some idea how a comparatively inexpensive co-operative project can be developed it may be interesting to know of a simple development of this nature which is now being successfully carried out, in so far as the financing is concerned, and which promises to be successful from the tenants' side.

For the development of the operation in question it was first determined that in a rapidly growing industrial city there were a number of families who would be interested in buying an apartment on the co-operative plan provided the cash payment were not too high. It was further learned that as far as a building loan was concerned co-operation might be expected either from a financing corporation, definitely developed to aid in meeting the housing shortage, or from an insurance company which had set aside a certain amount of money to assist in solving the housing problem.

The first step was to work out sketch plans and to outline specifications for an apartment building simple in design and equipped and planned to include every possible economy, but at the same time providing comfortable dwelling quarters for a class of people represented by the employes of local factories. Having determined that the element of financing and demand could be definitely counted upon, the advancing of the necessary equity to carry out this project was undertaken by a group of business men representing employers of labor, and others interested in meeting the local housing shortage.

The general figures on this project were worked out somewhat in this manner:

1 — That a building should be constructed providing ten apartments averaging six rooms each at a cost of $6,500 per family, consequently making the total cost of the building $65,000. The building in question is a four-story, walk-up apartment having simple modern conveniences.

2 — That suitable land for the location of this building should be obtained for $5,000.

3 — That a mortgage loan, bearing an amortization clause as later described, could be obtained, amounting to 60 per cent of the cost of land and building or 60 per cent of $70,000, being a building and first mortgage loan of $42,000, 20 per cent of which was to be paid off over a period of five years. This meant in simple figures that, adding a profit of $500 per family for those who financed the equity in this building, each apartment might be put on the market for purchase at $7,500 made up as:

Pro rata cost of building	$6,500
Pro rata cost of land.............	500
Pro rata allowance for profit	500
	$7,500

Of this amount the advancement of $4,200 as part of the building loan was assured, leaving an actual cost balance of the difference between $7,000 and $4,200, or $2,800 per family, this being the amount of equity advanced by the promoting group.

Having completed the details of the operation thus far a stock company was formed representing the equity in the sales price of the building,— the sales price as given being $75,000; the first mortgage being $42,000, and the original owners having agreed to allow a second mortgage of $15,000 to be paid off on an amortization plan by those who purchased stock carrying occupancy privilege in the building.

From the viewpoint of the buyer, therefore, an apartment in this building could be purchased for the gross price of $7,500 of which $4,200 represented a pro rata share in the first mortgage, and $1,500 represented a pro rata share in the second mortgage, which is to be paid off in five years. Taking this total of $5,700 it is found that the purchaser of an apartment must pay $1,800 in cash for which he receives one-tenth of the stock of the corporation carrying with it the perpetual leasehold privileges for one apartment. Having paid $1,800 the tenant has assumed these liabilities which might be termed owner's annual rental:

Interest on first mortgage of $4,200 at 6%	$252
Interest on second mortgage of $1,500 at 6%	90
Amortization of 20% of first mortgage over 5 years, or 20% of $840	168
Amortization of second mortgage over 5 years	300
Pro rata cost of maintenance and service charges	300
	$1,110

In this total of $1,110 the items of $168 and $300 representing amortization payments cannot be figured as actual rental, but are actually installments on the purchase of the apartment and consequently represent savings. Therefore the actual rental of the apartments approximates $642 or about $54 a month which is actually decreased by the cessation of interest on the amortization payments until, at the end of five years, the owner of one-tenth of the stock representing the tenancy of one apartment actually pays as a rental charge:

Interest on reduced first mortgage, $3,360 at 6%	$201.60
Second mortgage has been paid off	
Cost of maintenance and service charges	300.00
Owner's rental, after fifth year	$501.60

or approximately $40 per month, to which must be added any repairs which the owner may wish to make to his own apartment, as the owner always assumes interior repairs and decoration in the co-operative plan.

No item is included, of course, on money invested as this interest is returned in the form of reduced rental cost.

In the purchasing of apartments as here outlined the purchaser's viewpoint is that by paying an annual amount, not exceeding normal rental in the locality, he is obtaining the use of an apartment and at the same time buying his share in the building in the same manner that furniture might be purchased on the installment plan.

From the viewpoint of the developers of this project, each is receiving interest on his money and a profit of $500 on a $2,800 five-year interest bearing investment, at the same time helping in the relief of the housing situation.

In later issues we expect to give detailed examples of actual operations where the co-operative idea has been applied to the development of inexpensive types of apartment houses. It is plainly evident that the co-operative apartment of comparatively inexpensive type can be developed for the family which can afford a moderate cash payment, and a low but definite investment each year over a period of years until amortization or indebtedness has been cleared off.

Another method of developing an operation of this type is, of course, getting together a group of future tenants who will do the necessary financing, thus eliminating the middleman who first provides the equity. This requires a larger amount of capital per family for immediate investment, unless it is possible to borrow second mortgage money, paying relatively high fees which may be distributed over the first few years as owner's rental.

In general, however, the successful co-operative developments carried out thus far have included a promoting entity of some sort, which for the sake of profit has either carried out the operation and then sold stock, or has been the actuating force to bring together a group of prospective tenants, receiving a promoter's fee which has been made chargeable to building cost.

A Note of Optimism as to Business Conditions

FROM the viewpoint of increased business for next year, it will be interesting to architects to realize that in the circles of big business there is an increasing spirit of optimism as to future business conditions. This desirable state of mind is supplanting a former condition in which important things seemed to indicate conditions varying from possible acute business panic to the generally accepted belief that we were doomed for at least a short period of depression.

The last two months have been months of readjustment. In many industries labor has been finding itself. According to the monthly review of the Federal Reserve Board for July these interesting conditions bearing upon general business have been thus defined:

"One notable feature of the business situation during the month has been a change in labor conditions. An important factor in this connection has been the development of unemployment in various parts of the country. This unemployment has been apparently chiefly due to three factors. Where poor transportation prevented deliveries of fuel and raw materials some plants have been obliged to curtail operations and thereby reduce opportunities for employment pending better conditions; in other manufacturing districts the shutting down of mills as a result of cancellation of orders and lack of demand has also thrown considerable numbers of men out of work; elsewhere, inability to obtain capital for construction and the consequent abandonment or delay of undertakings that had been contemplated have produced a certain amount of unemployment.

"An effect of the changed labor situation, which has been the subject of general comment in the various Federal Reserve districts, is an increase in the efficiency of labor. One of the largest producing companies in the Cleveland district reports the greatest four months in our history of pounds produced per man.

"Boston reports that labor is less insistent in its demands and during the first half of July only ten new strikes were reported to the Massachusetts Department of Labor, but two of these involving any considerable number of men. During the latter part of June and the first two weeks of July there was a marked decrease in the demand for factory help. The Boston Public Employment Office reports a surplus of machinists, mechanics and general factory helpers.

"Retrenchment in government manufacturing operations has released some labor. Unskilled labor is also more plentiful than heretofore. In the agricultural regions, however, there is little or no relief from the shortage of farm labor. In the extreme Southern part of the country a better supply of agricultural labor has resulted from the slackening of industrial production.

"In New York there has been a distinct, though not large, increase in unemployment and this is more noticeable than usual at this season in the clothing trades. The labor difficulties at the port of New York have been reduced. Generally speaking, conditions are more stable than they were several months ago. Local shortage of unskilled labor due to the scarcity of immigrant hands is observable.

"A notable event of the month has been the decision of the Railway Wage Adjustment Board, which has resulted in awarding a wage increase to railway workers estimated to aggregate $600,000,000, and presumed to represent an average increase of 21 per cent or over for railway employes as a whole, although the increase granted has been greatest in the lower paid grades of employment.

"Labor in many parts of the country is reported as increasing in efficiency, and a better spirit of co-operation is said to exist between employer and employe."

Another interesting and important prediction is contained in this recent statement made by Judge Gary before sailing for Europe:

"From my viewpoint I think conditions should be considered satisfactory. In some respects I think there has been a lack of prudence in business management since the armistice of 1918. I refer especially to prices. There seems to have been a disposition on the part of large numbers to ask and accept the highest prices which could be obtained. Consequently there has been added to going prices the amount which the producer has been obliged to pay, with profits on the whole, and the purchaser has thus been obliged to charge an increased price to his customers. Besides there have been added many government taxes and other expenses. Therefore, increases in costs of production and consequently in selling prices have been passed on from one to another.

"In addition to this situation the disposition to work and produce has been materially diminished. The workman in the field, at 4 o'clock or some other early hour, drops his tools and leaves the hay or grain unsheltered, to be spoiled or injured by rains during the night, when under old methods it would be stacked or housed before quitting work. This practice has been followed in many different lines of work.

"In order to remove and replace a headlight on a locomotive it has been necessary to employ four different men, because of labor regulations, where one man heretofore performed the service in less time. It has been recently published that the tailors have announced an increase of 15 per cent in selling prices because the workmen advanced their rates 15 per cent. These common illustrations are well known to the average individual. The custom has prevailed of doing as little work as possible and of securing as large a pecuniary result as could be obtained.

"However, somewhat to my surprise, I have, upon inquiry during the last thirty or forty days, ascertained that labor at our various plants is more efficient per man than it has been at any time during the last five years."

The New York *Times* in commenting on an interview with Judge Gary says that in his opinion everyone who has been increasing his profits beyond reason and doing it intentionally has been operating against his own interests. He asserted that if the tailor had borne the additional cost to him resulting from higher wages he would probably have had a reasonable profit left and would have used his influence in keeping prices from advancing further and in restoring a fair equilibrium.

Such inexcusable conditions, in his opinion, have naturally been followed by a diminution in the buying movement. This applies to many different lines, but apparently it has not as yet reached the steel business to a large extent. In calling attention to the disposition on the part of the average man to be more careful in his buying, he gave it as his opinion that this tendency probably would become more and more noticeable throughout the country in the next few months.

In conclusion Judge Gary said: "While I recognize, and for many months have comprehended, dangers in the general situation, I am more optimistic in regard to the future of this country than I have been at any time during the last six years. If people generally will recognize the possible dangers which have been hinted at and will, each for himself or herself, do everything possible and practicable to improve conditions, we shall soon return to a basis of living which should be entirely satisfactory."

EDITORIAL COMMENT

SICK HOUSING CONDITIONS

INTEREST is focusing on the national housing shortage in accelerated degrees as the fall season approaches. While the sick condition of the building industry as far as it relates to housing has been patent to any one who gave the matter a thought, difficulties growing out of hurried, thoughtless legislation, lack of transportation, speculation in materials, and the unwillingness of loaning institutions to extend financial aid have steadily increased till there is now created a situation in which it is impossible to provide a satisfactory house for a family of average income within a cost they can assume.

Shelter is an absolute necessity and it must be provided; if it will not be furnished through the channels to which we are accustomed it will have to be recognized as a duty of State or Federal Government and provided from public funds. This is not in accord with American principles and it should not be made necessary. It would be the most expensive and most inefficient way of meeting the problem.

The solution should be sought in removing from house construction or at least in reducing them, the harassing conditions which have held back building since the armistice. The greatest single difficulty is the lack of money for building loans; others are comparatively incidental and will be lessened with the normal increase in production, but if new money is not made available a deadlock will occur which will have disastrous results for the building industry.

The Associated Metal Lath Manufacturers in a recent bulletin have set forth in detail the reaction on the mortgage market of the Federal Income Tax and recommend most strongly that every one interested in the welfare of building exert his influence in developing a demand that Congress exempt mortgage income from this tax.

The bulletin says: "The banks were obliged to stop construction loans, not because of prices of materials, but because they could not dispose of real estate mortgages to their customers. This was largely due to the Federal Income Tax which, with its heavy Surtax on the larger incomes, makes mortgage buying at 6% absolutely impossible.

"No one can blame the man with an annual income of $50,000 for refusing to make investments that will yield but $412 on $10,000 when he can get $600.

"The bulk of new money for mortgages must come from estates and individuals having such excess funds as are not available until incomes of $20,000 or over are reached. As an example, an income of $30,000 is subject to a Federal Normal and Surtax totalling 21% in addition to the income taxes levied by several of the states. This income tax must be deducted from the gross return on the mortgage before the net return to the investor is found.

"To compete with the 6% Municipal Bond which is exempt from income tax, the banks cannot offer a $30,000 investor anything less than 7.6% on a taxable mortgage, or to the $50,000 investor anything less than 8.7% and have him come out even. With mortgages tax exempt, however, they could readily be sold on a 5% and 6% basis."

It is evident from these figures that the present burden of taxation is a very important factor in holding back construction. Examples of the practical effect of this condition are being brought out in the hearings conducted by the Senate Committee on Reconstruction and Production in various important cities of the country and one of the recommendations which this committee will undoubtedly make will be the exemption of mortgage income from taxation.

As we go to press preliminary meetings are being held in New York to consider the proposals for housing relief that will be presented to the New York State Legislature which convenes in a special session on September 20 to be devoted entirely to housing matters. It is expected that this legislature will exempt mortgages from the State Income Tax and that it will memorialize Congress to adopt similar legislation with reference to the Federal Tax.

There is then a movement started in this direction, but it will need the concerted support of all who are anxious to see our housing difficulties met, if the object is to be realized to a satisfactory degree.

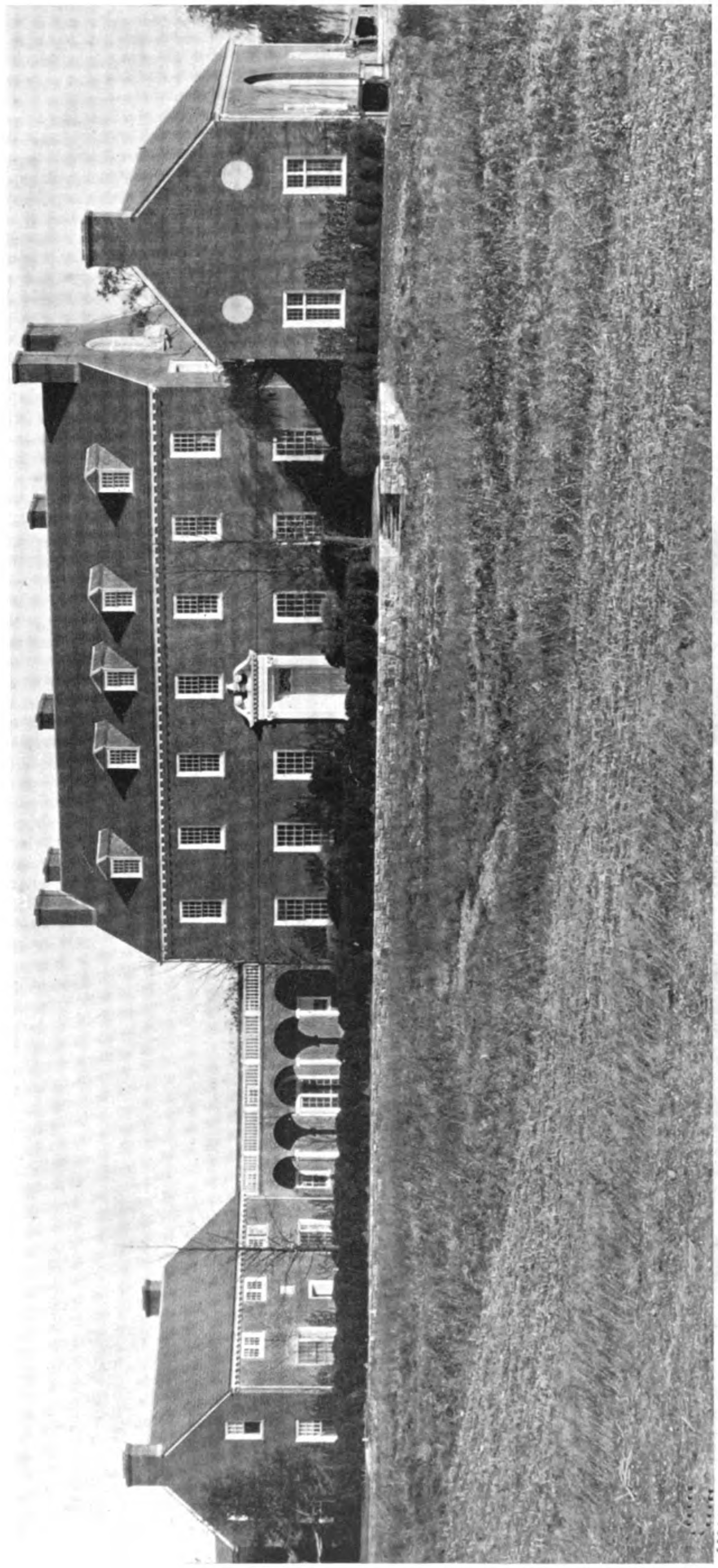
LE BRUN TRAVELING SCHOLARSHIP COMPETITION

THE executive committee of the New York Chapter of The American Institute of Architects, as trustees of the Traveling Scholarship, founded by Pierre L. Le Brun, announces a competition for the selection of a beneficiary, the program of which will be issued about November 1, 1920, calling for drawing to be delivered about January 15, 1921.

The following excerpts from the deed of gift explain the award and conditions:

> "Fourteen hundred dollars is to be awarded to some deserving and meritorious architect or architectural draftsman, resident anywhere in the United States, to aid him in paying the expenses of an European trip, lasting not less than six months."
>
> "Any architect or architectural draftsman, a citizen and resident of the United States, not under twenty-three or over thirty years of age, who shall, for at least three years, have been either engaged in active practice, or employed as an architectural draftsman and who is not and has not been the beneficiary of any other traveling scholarship, shall be eligible to compete."
>
> "Every competitor must be nominated by a member of the American Institute of Architects who shall certify in writing that the above conditions are fulfilled, and that in his opinion the competitor is deserving of the Scholarship. No member of the Institute shall nominate more than one (1) candidate."

It is requested that those wishing to enter the competition arrange at once for their nomination by any member of the American Institute of Architects, according to the conditions outlined above, which nomination should be sent with his application so that it may be received before November 1, 1920, to Louis Ayres, 50 East 41st Street, New York City.



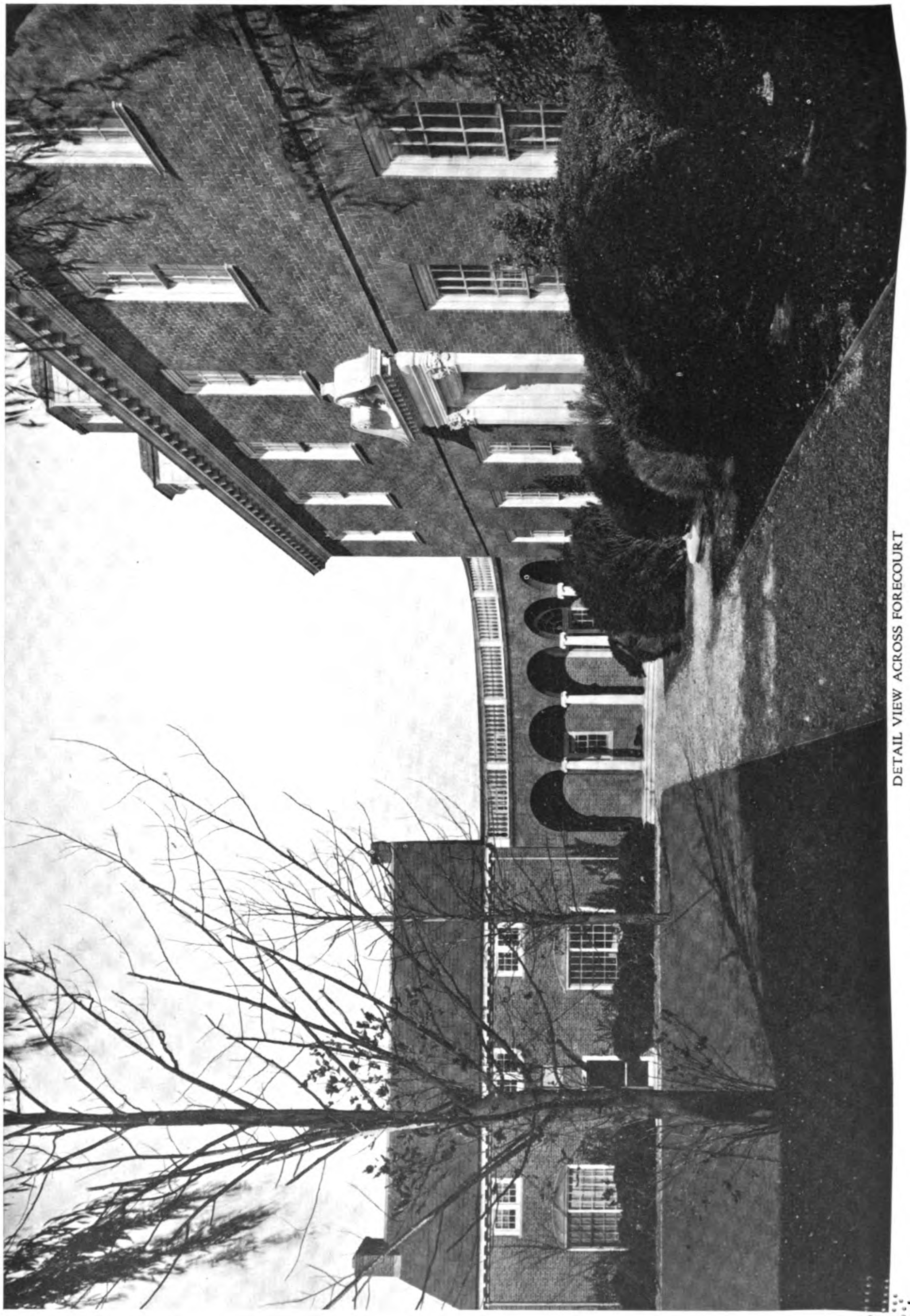
HOUSE OF LATHROP BROWN, ESQ., ST. JAMES, LONG ISLAND, N. Y.
PEABODY, WILSON & BROWN, ARCHITECTS

VIEW FROM APPROACH

VIEW OF CENTRAL BLOCK

HOUSE OF LATHROP BROWN, ESQ., ST. JAMES, LONG ISLAND, N. Y.

PEABODY, WILSON & BROWN, ARCHITECTS



DETAIL VIEW ACROSS FORECOURT

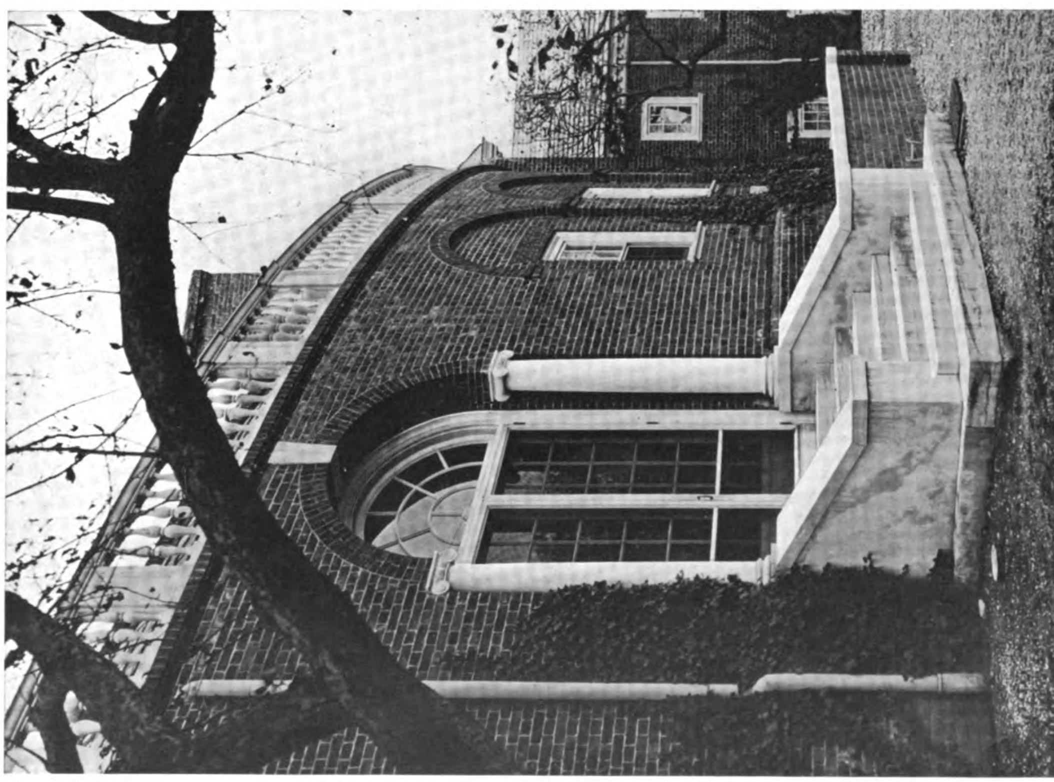
HOUSE OF LATHROP BROWN, ESQ., ST. JAMES, LONG ISLAND, N. Y.

PEABODY, WILSON & BROWN, ARCHITECTS

DETAIL OF ENTRANCE

HOUSE OF LATHROP BROWN, ESQ., ST. JAMES, LONG ISLAND, N. Y.

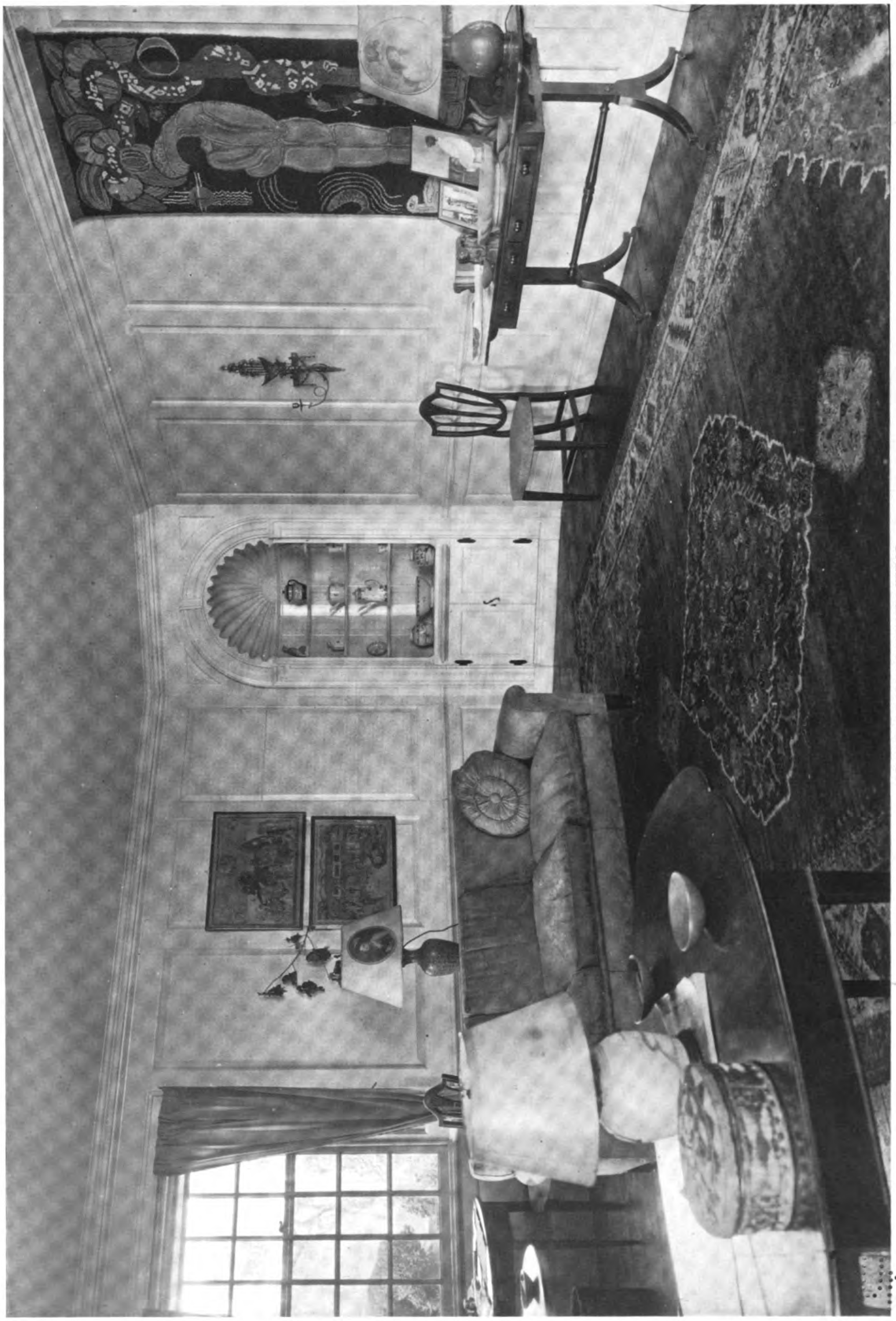
PEABODY, WILSON & BROWN, ARCHITECTS



DETAILS OF SUN ROOM CORRIDOR

HOUSE OF LATHROP BROWN, ESQ., ST. JAMES, LONG ISLAND, N. Y.

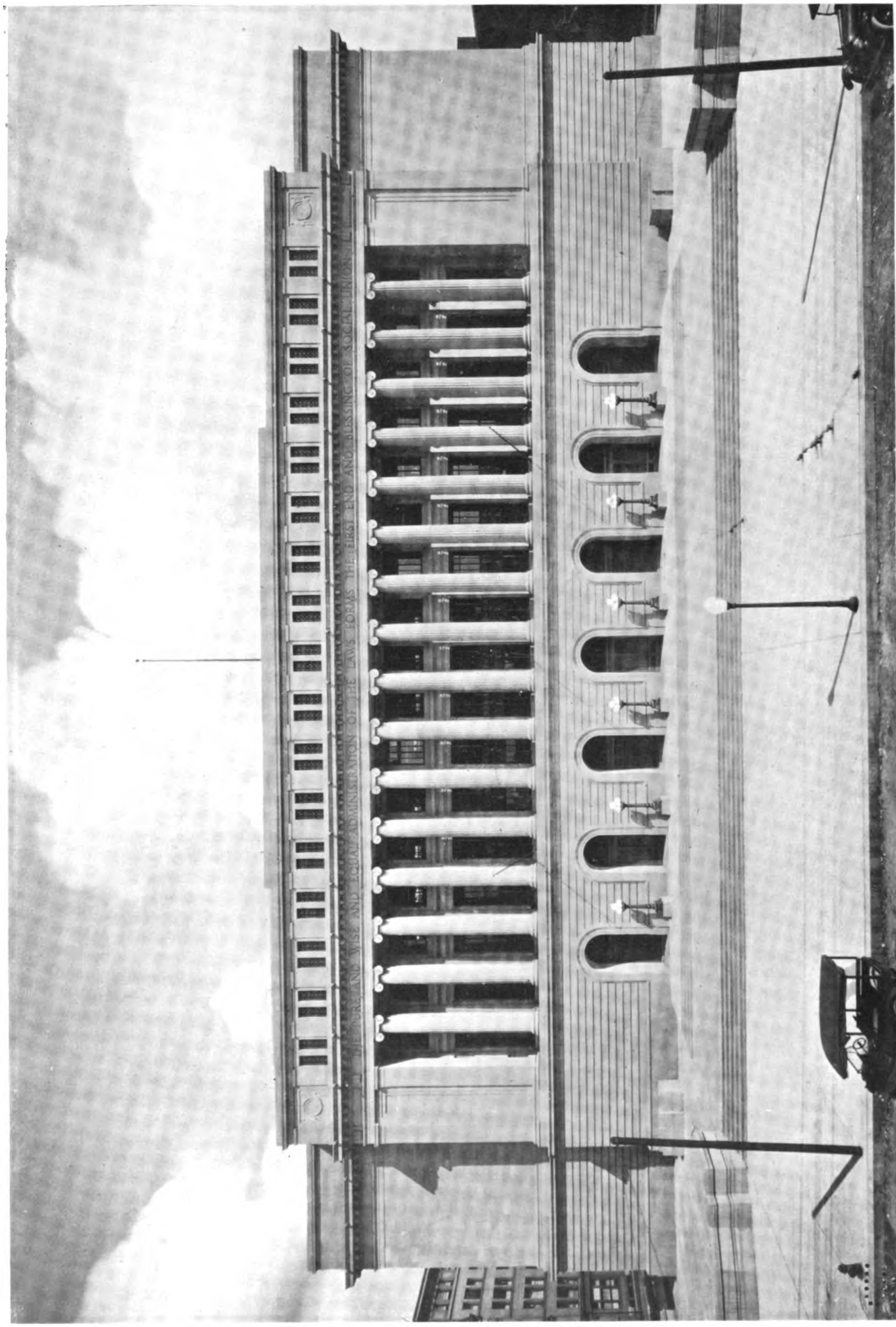
PEABODY, WILSON & BROWN, ARCHITECTS



LIVING ROOM IN NORTH WING

HOUSE OF LATHROP BROWN, ESQ., ST. JAMES, LONG ISLAND, N. Y.

PEABODY, WILSON & BROWN, ARCHITECTS



PRINCIPAL FACADE

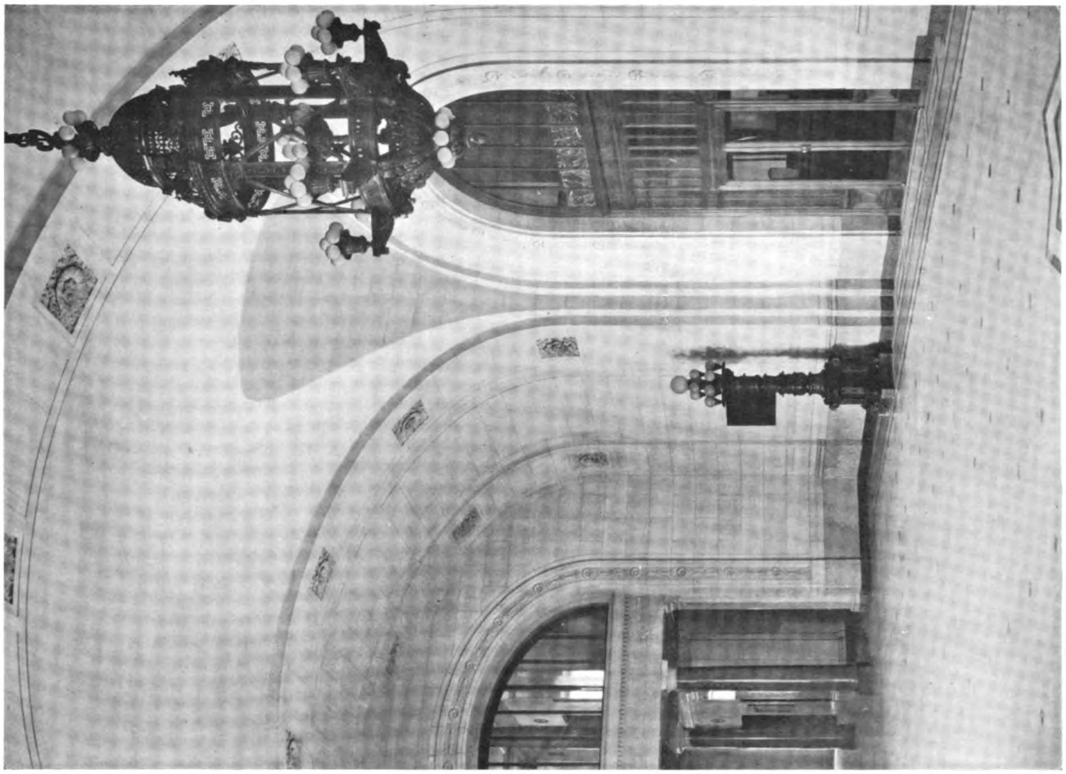
HAMILTON COUNTY COURTHOUSE, CINCINNATI, OHIO

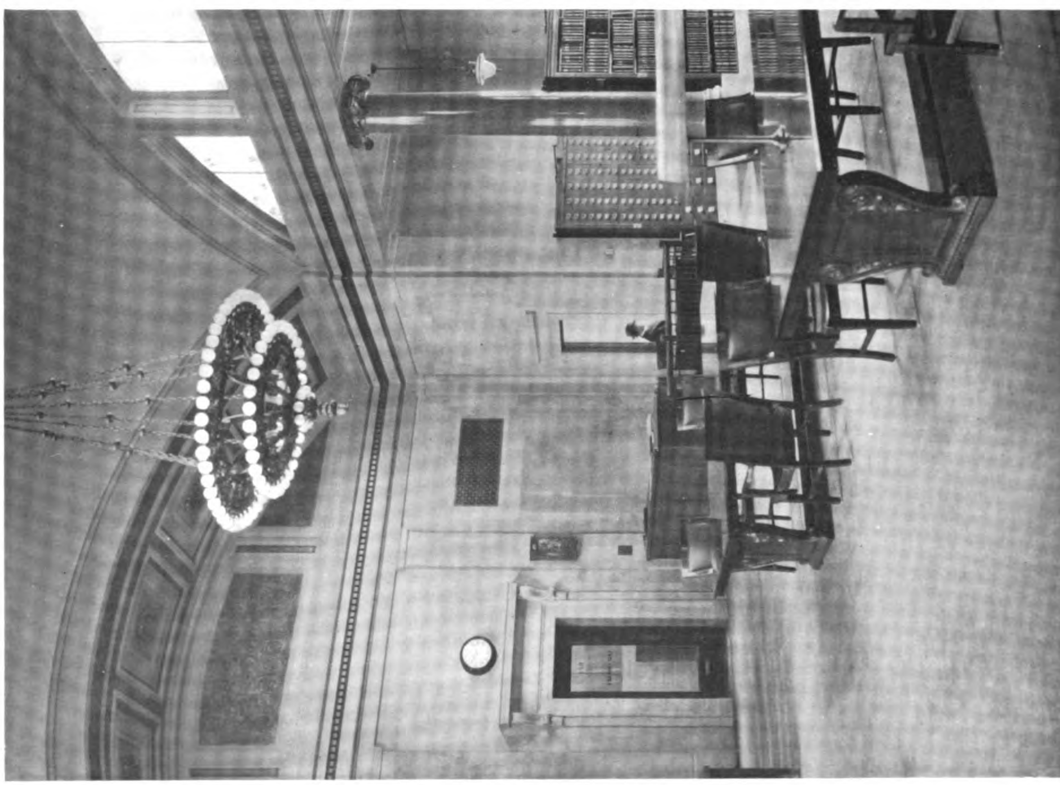
RANKIN, KELLOGG & CRANE, ARCHITECTS

CORNER ENTRANCE PAVILION

HAMILTON COUNTY COURTHOUSE, CINCINNATI, OHIO

RANKIN, KELLOGG & CRANE, ARCHITECTS





DETAILS OF LAW LIBRARY AND ENTRANCE HALL

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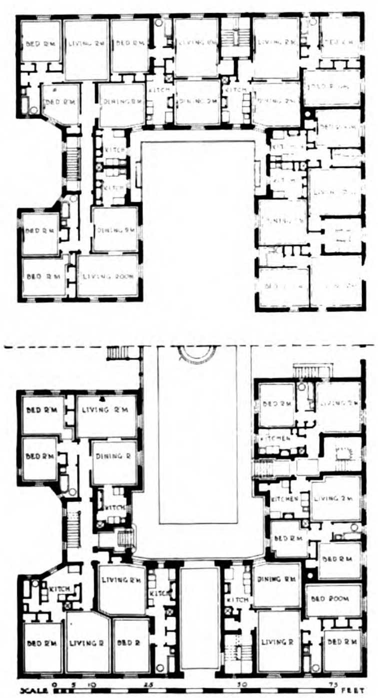
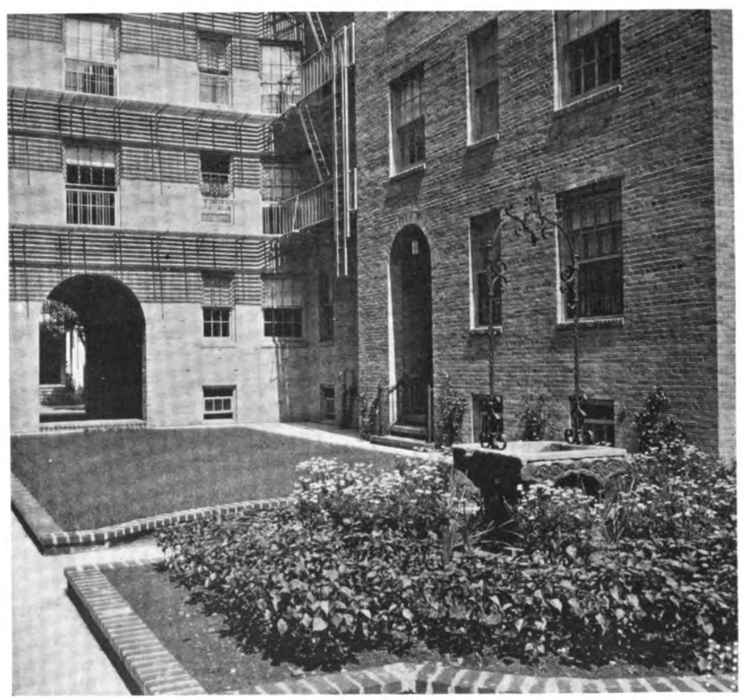
VIEW FROM CONCOURSE



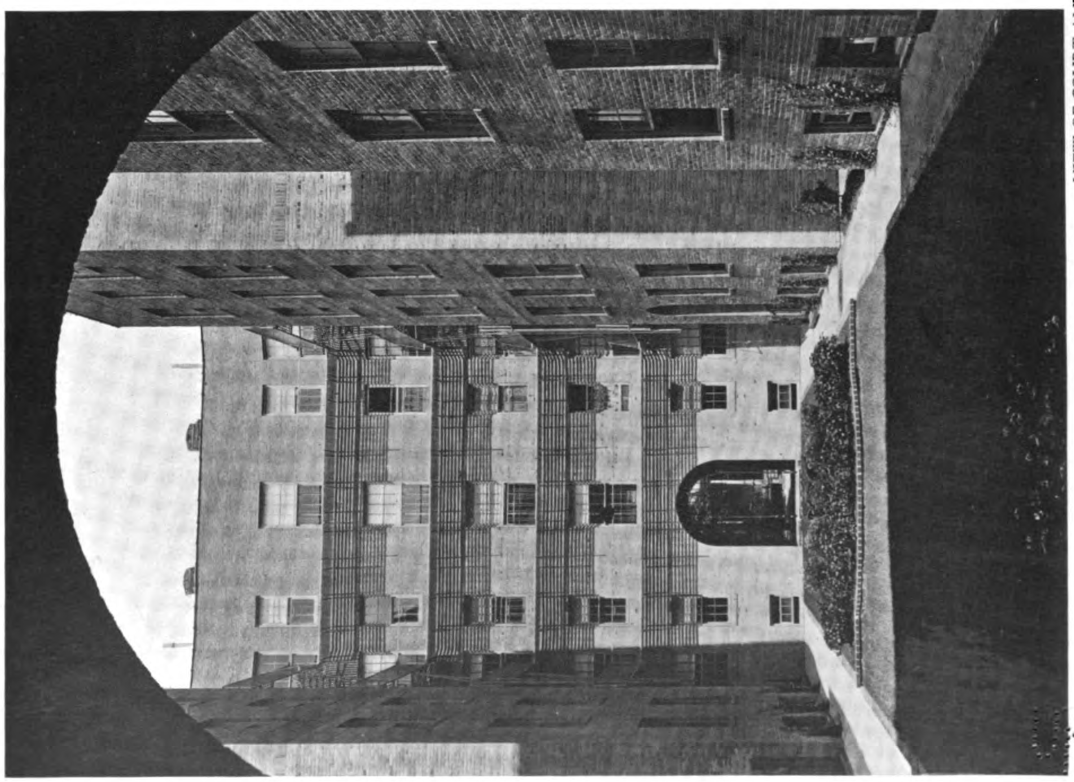
HALF FIRST AND TYPICAL PLAN

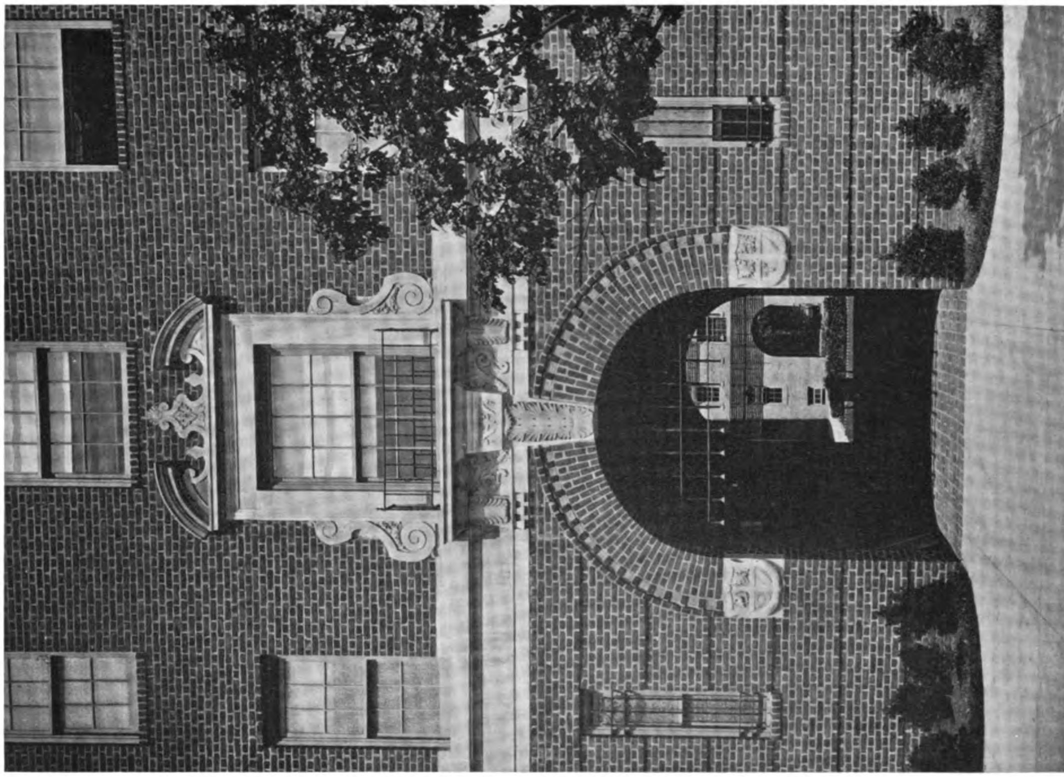


VIEW IN COURT

APARTMENT HOUSE, CONCOURSE AND 183D STREET, BRONX, NEW YORK

ANDREW J. THOMAS, ARCHITECT





VIEW OF COURT AND DETAIL OF ENTRANCE
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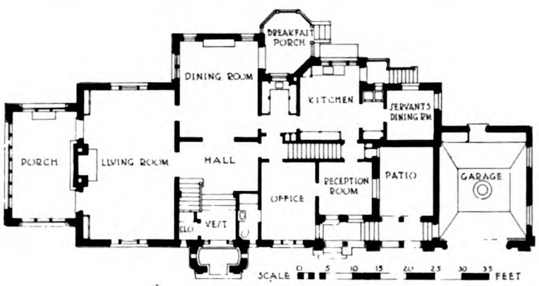
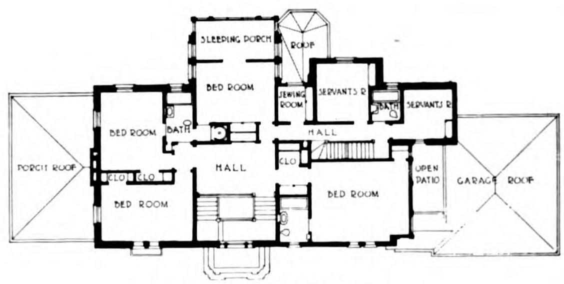
ANDREW J. THOMAS, ARCHITECT



FIRST FLOOR PLAN



SECOND FLOOR PLAN

HOUSE OF DR. W. R. PARKS, EVANSTON, ILL.

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OCTOBER 1920

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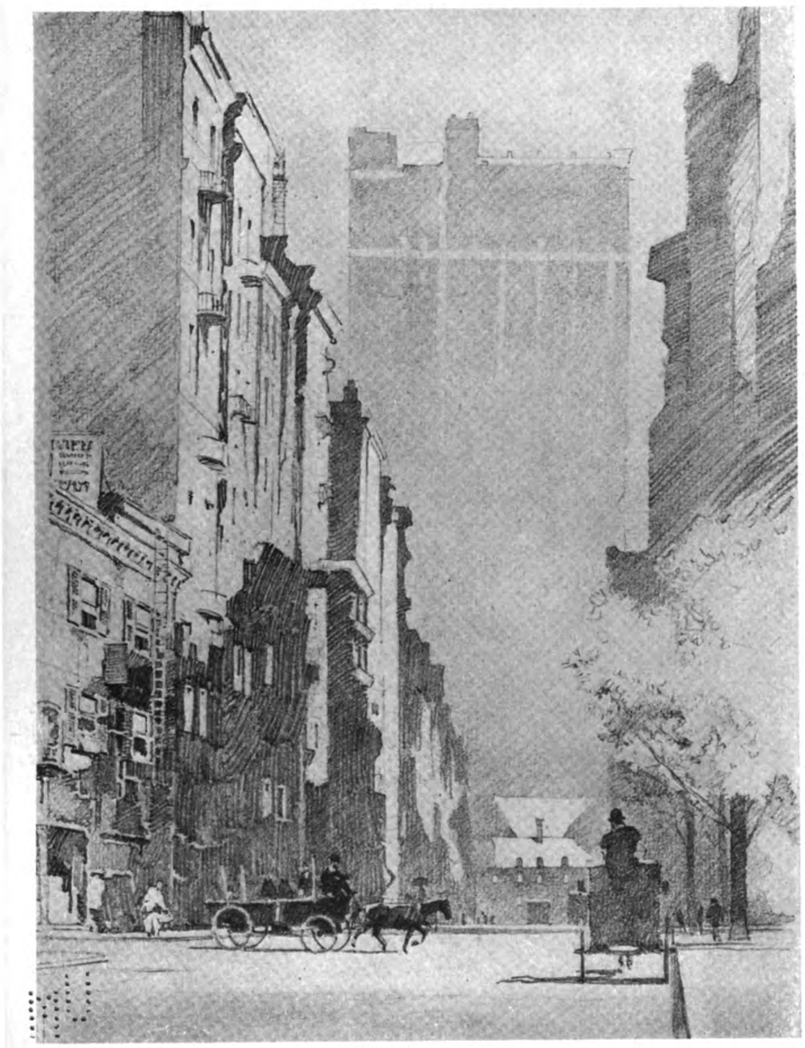


LOOKING SOUTH FROM WASHINGTON SQUARE,
NEW YORK CITY

From Pencil Drawing by Harold R. Shurtleff

The
ARCHITECTURAL
FORUM

VOLUME XXXIII OCTOBER 1920 NUMBER 4

Some Lesser English Churches

FROM DESIGNS BY GILBERT SCOTT, A.R.A., ARCHITECT

By R. RANDAL PHILLIPS

MR. GILBERT SCOTT is the third of a line of modern English church architects who have borne the same name, each distinguished in his generation, though each represents a different kind of achievement. In the heyday of the Gothic revival it was Sir Gilbert Scott who rose to fame. He it was who wrought mightily in the restoration of our cathedrals and parish churches. We are still astounded by the record of his activities but we think rather sadly of the wholesale making anew of ancient buildings that was the inevitable accompaniment of revival enthusiasm. His son, George Gilbert Scott, is a far happier memory. We have indeed in his best known church, St. Agnes', Kennington, a splendid piece of modern Gothic free from pedantry, with a warmth and life about it that Sir Gilbert could never have compassed. The present Mr. Gilbert Scott had, therefore, in his father's work, a much more exhilarating model than in what his grandfather did. He too, in one sense, is carrying on the same torch that was lighted in mid-Victorian England, but he reflects the different spirit of our own times. The zeal which set new designing in what they conceived to be the thirteenth or fourteenth century manner, and which made them dogmatic about the hollow of a moulding or the precise ornament for a capital, finds no exponent today. Gothic is no longer a style to be copied with minute exactitude, but a manner of building made to suit the needs of the modern church.

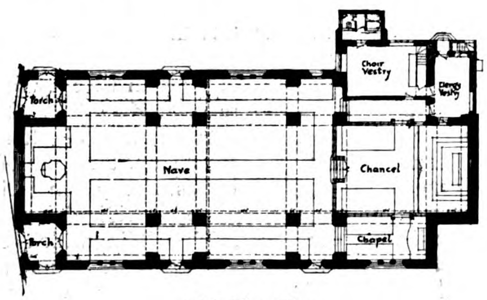
It seems likely that Liverpool Cathedral will constitute Mr. Scott's magnum opus, since it is the largest Protestant cathedral undertaken in England since the reformation, and that as yet it has advanced no further than the choir and lady chapel. But though this great fabric has absorbed his chief attention since he won the commission as a young man of twenty-two,—that was in 1905,—he has nevertheless designed and carried out a number of lesser ecclesiastical buildings. Five of these are here illustrated and brought under consideration. They are all pre-war churches, as might be supposed, remembering the five years' ban on building other than that for some sort of war purpose, and remembering also that since the armistice there has been no church building of any kind in England.

The most recent of these five churches is St. Paul's, Derby Lane, Liverpool. This affords an unusually striking example of bold, straightforward brick building which relies for its exceedingly graceful effect entirely upon the use of very simple materials, and strong, vigorous structural lines. Of applied ornament indeed there is very little, the ribs of the brick vaulting serving to give relief to the interior, in connection with exposed brickwork around the tall window openings and at pier angles. The plan is interesting. It consists of choir and nave with three transepts on either side and a large square tower rising above the intersection of the central transept with the main roof. This is very clearly expressed on the interior. It would indeed be difficult to conceive of a church which more fully showed its arrangement on the outside. Inside, an original effect is produced by the intersection of the transept vaulting with the main vault, resulting in the main arcade being composed of high and low arches alternately.

Externally the church is faced with small silvery gray bricks laid up in an appropriate bond; the unusual plan of the building makes possible broad wall surfaces which, particularly in a structure of brick, add a definite element of strength to the appearance of the building. The square tower rises to a height of about eighty feet and its roof, like the roofs of the entire church, is of tiles.

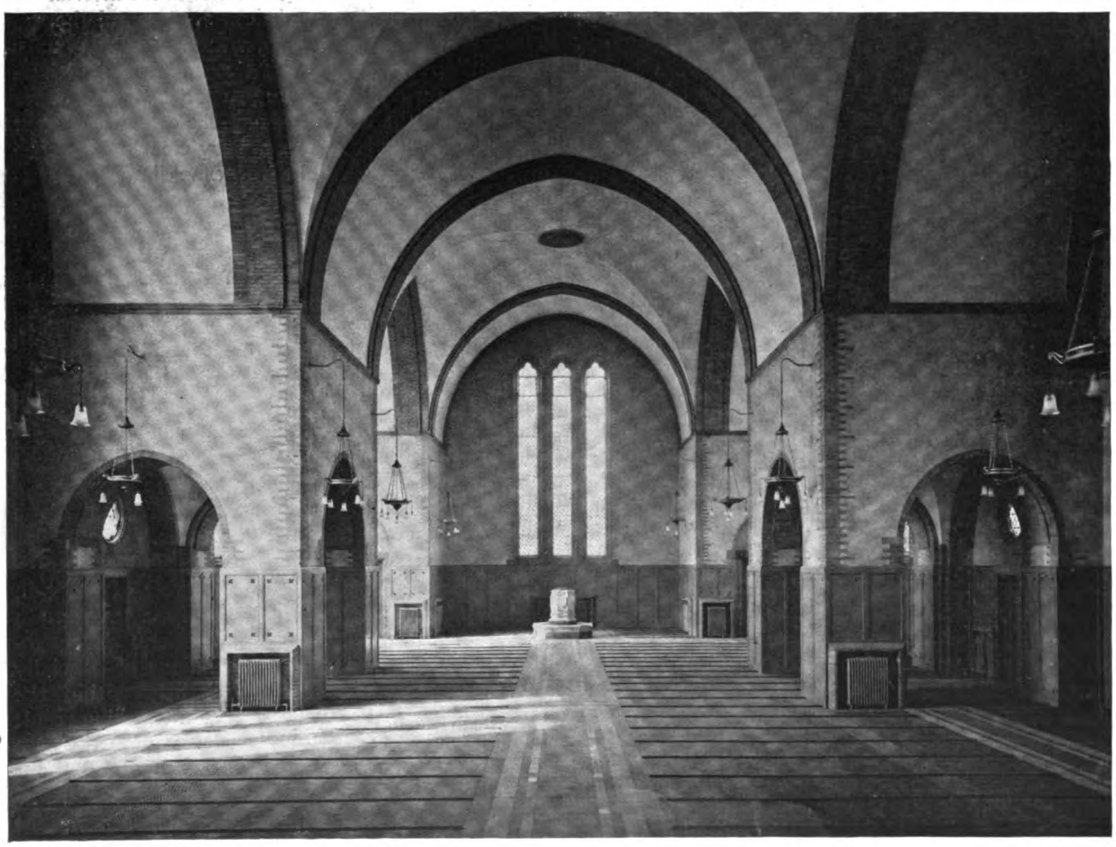
A very effective though extremely simple arrangement has been made of the grouping of the tall, narrow windows at the West end of the nave and in the several transepts. By placing them closely together, divided by piers or mullions of specially modeled brick and recessed slightly within the outer surface of the walls, a very interesting result has been obtained. Equally successful is the high wall of gray brick which encloses the ground about the church and the use of wooden gates in the arches from the street into the open porches. The interior of the church is consistently simple. The walls are plastered and a high dado of wood, paneled and painted, runs about the walls. The aisles are paved with tiles, with wood blocks elsewhere, the use of a wood floor beneath benches or chairs being probably due to the fact that many people object to the coldness of tiles or stone. At the South side of the choir is a small chapel which is used for daily services and at the opposite side are arranged the choir room and the clergy sacristy over which extends an ample space for an organ chamber.

In the building of this church, which accommodates a congregation of about 640, quite obviously the controlling factor was cost. An imposing structure was required at a minimum of expense, and Mr. Scott has very successfully met the conditions, by adopting largeness of scale and simplicity and dignity of proportions rather than any elaboration of treatment. It is, perhaps, not over satirical to observe that whereas we never hear of the cheap hotel or railroad station, the cheap church is always confronting us. And the architect's task to provide it, effectively, is not easy. The available funds are almost always insufficient to do more than make possible the barest fabric, and though in later years all manner of enrichment may be added, not often does this follow a complete scheme, pre-conceived by the architect and in accordance with his own designs. He who pays the piper often calls the tune, and so we usually have the sight of an interior being successively ruined by "memorial" windows, organs and other features thrust upon the church by well meaning donors who are often wholly devoid of a sense of appropriateness or suitability.



Main Floor Plan

It has often been Mr. Scott's problem to design churches on this basis of minimum cost, and that his main reliance on structural lines and good proportion is right may be seen again in the church at Northfleet, at the mouth of the Thames. This church stands on high ground in the midst of a poor district, and its tower is a landmark for miles around. A very

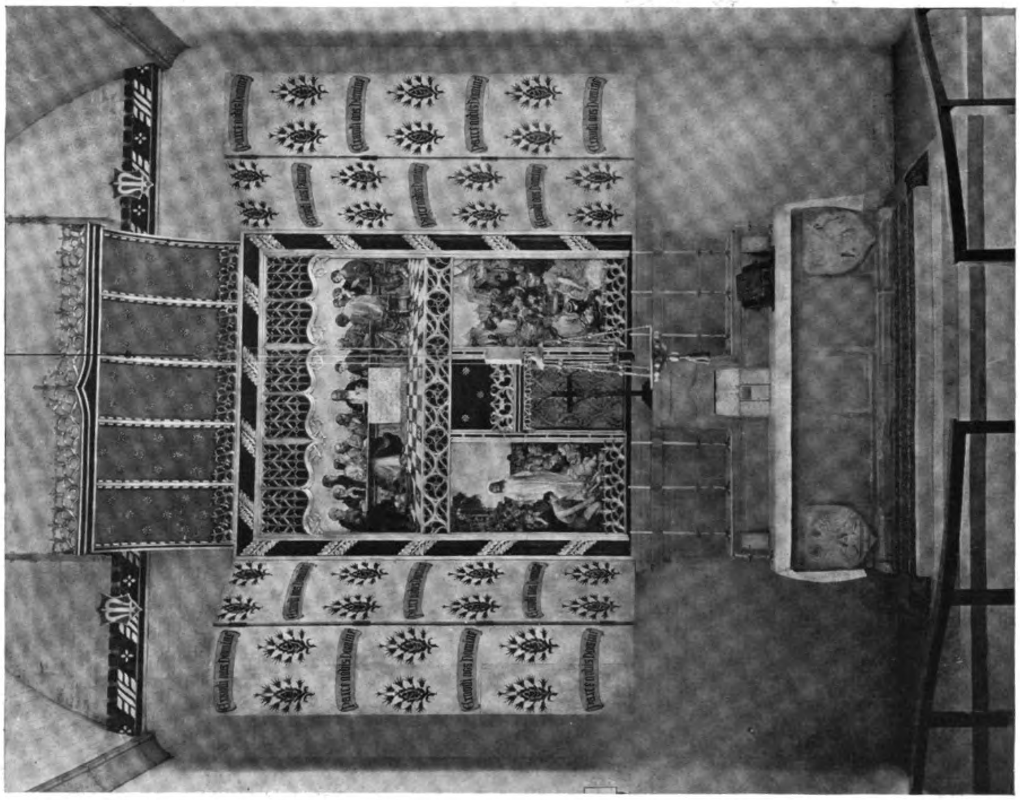


View of West End, St. Paul's Church, Derby Lane, Liverpool

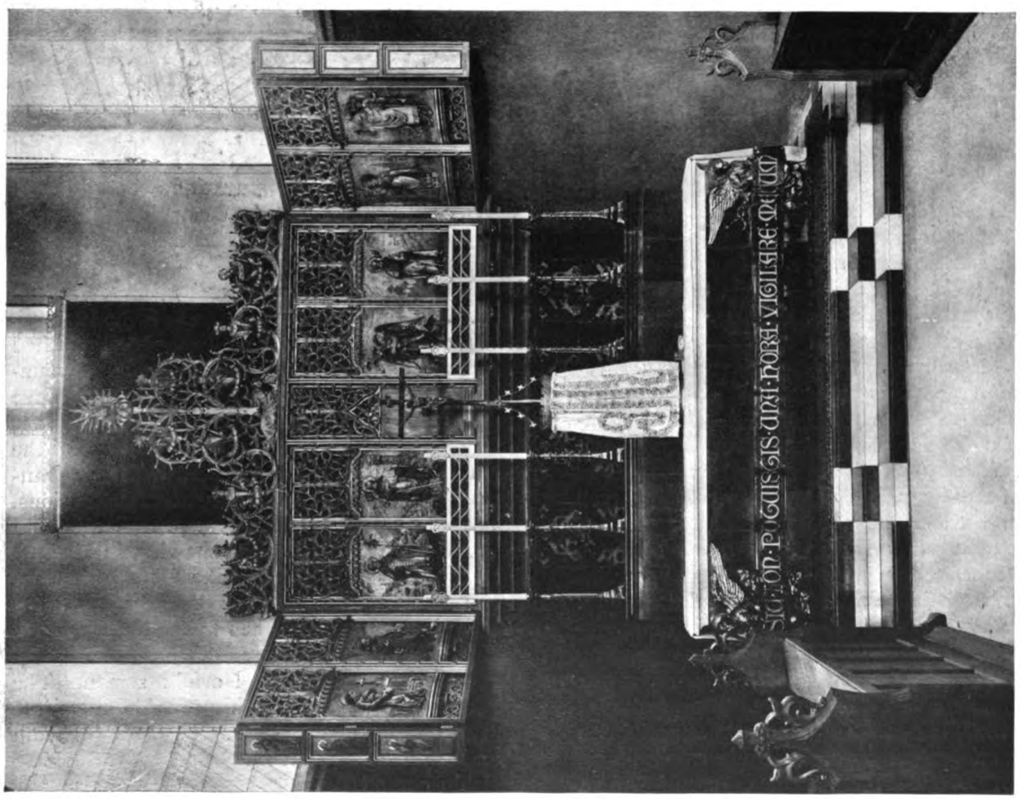
St. Paul's Church, Derby Lane, Liverpool

noble tower this, rising sheer from the pavement and maintaining its square form to the summit, where it has no crowning flèche, spire or cupola, but only a crenelated parapet. The outline is excellent, the slight breaking back of the succeeding stages giving all the relief that is needed, while the high, narrow belfry opening on the Western face produces a shadow depth that is extremely effective. The nave walls are carried high and the interior is ceiled straight across. Reinforced concrete beams are used here, as often in Mr. Scott's churches, frankly as modern construction. The fabric is of two-inch Crowborough bricks, plastered internally; the sanctuary roof is decorated in black and white on a red and gray ground, and the nave and aisle roofs, organ gallery front and other interior woodwork is finished in two shades of gray. This is a Catholic church, providing accommodation for about 380 worshipers. The accompanying view of the interior looking West shows the organ gallery across the end of the nave. The placing of organs at the West end is an old practice and much happier in effect than putting them in transepts or, —worst of all possible schemes,—setting them straight in front of the congregation, where the collection of metal pipes provides a conspicuous opportunity for strange and wonderful displays of stenciled decoration.

Two other Catholic churches by Mr. Scott are those at Ramsey, Isle of Man, and at Sheringham, Norfolk, each of these having a presbytery attached to the church. The Sheringham plan is very unusual, the church itself being L shaped, the nave occupying one arm, and a transept the other, the sanctuary coming, of course, at the junction of the two. The presbytery is connected with the transept and incorporates the sacristy accommodations. The nave is very high and narrow, the simple king post construction of the roof showing inside and being decorated with color. The focus of the interior is, however, the high reredos, which consists of a magnificently embellished frame around seven devotional panels of figure subjects, four of them being copied from an old Norfolk screen. The sanctuary has a black and white marble floor; the altar and retable are also of marble. Hanging from the roof and dividing the sanctuary from the nave is a richly carved Rood, colored and gilded, made

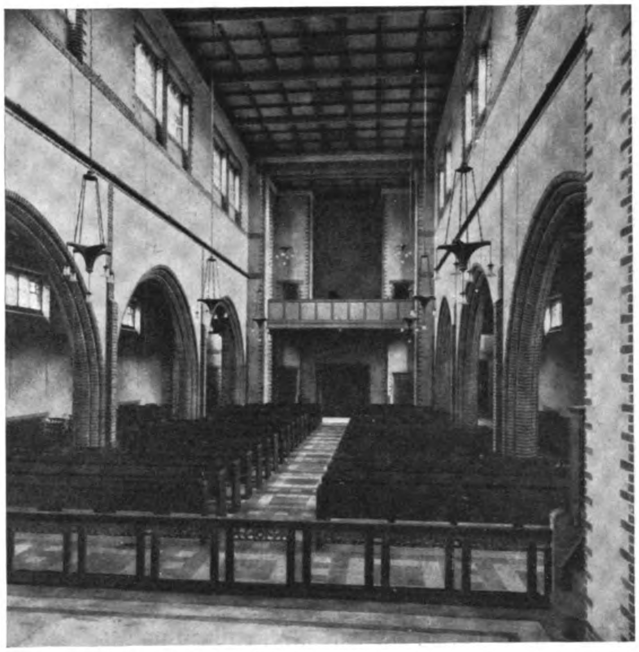


ALTAR OF ST. MARY'S CHURCH, DOUGLAS, ISLE OF MAN



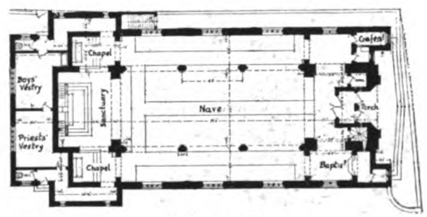
ALTAR OF CATHOLIC CHURCH, RAMSEY, ISLE OF MAN

FROM DESIGNS BY GILBERT SCOTT, A.R.A., ARCHITECT



Nave of Catholic Church, Northfleet, Kent

The church stands by the sea, on a site as romantic as that of Whitby or Iona. Being in a very exposed position, its walls are made extra strong and hollow, the outer thickness of wall being of rubble obtained from old buildings on the site, the inner thickness of smooth local bricks, which have been lime whited only, not plastered. The effect is that of truly monastic simplicity redeemed by the rare beauty of the structural proportions. The triptych in this church is a particularly good example of the architect's work in detail,—a modern version of flamboyant Gothic, full of vitality and rich fancy.

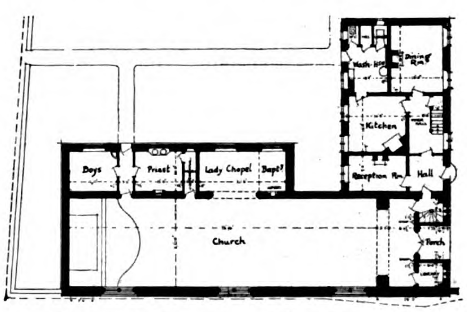


Main Floor Plan

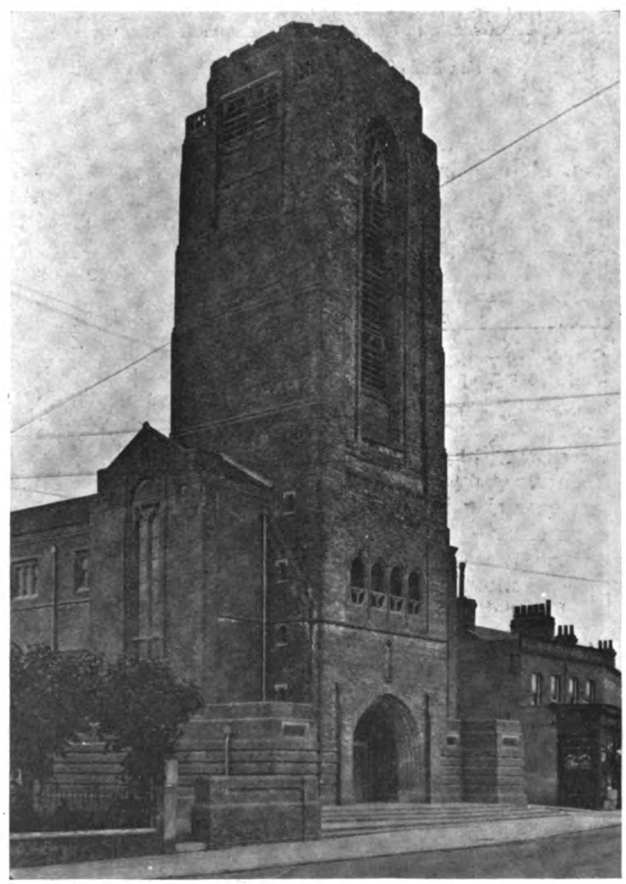
in the Tyrol by the clever craftsmen in wood of that district.

The interior of this little Norfolk church may well be regarded as one of the most beautiful among modern English work. It possesses much of the reticence and simplicity which have made the English country church, during many centuries, the model upon which church architects everywhere base their efforts.

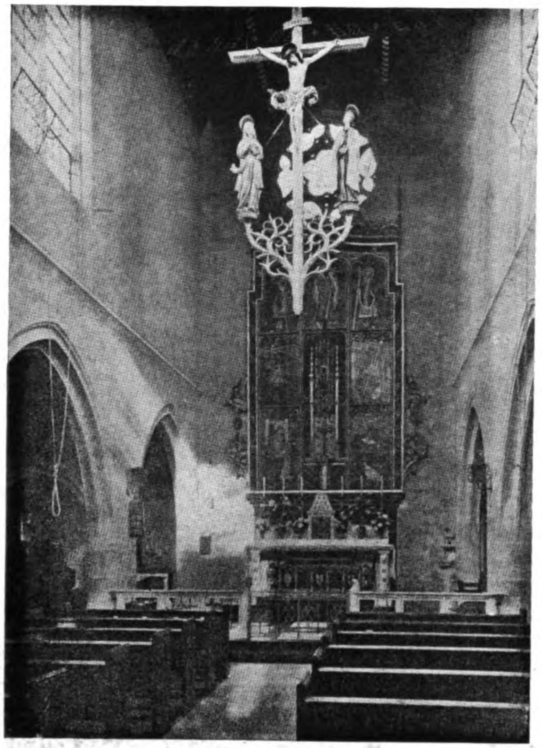
The other church with presbytery attached, at Ramsey, consists of a long nave and sanctuary, a plan with which Mr. Scott is unusually successful. There are no aisles and no transepts. Everything is severely plain and simple, but here again, as in all Mr. Scott's Catholic churches, color and gilt enrichment around the altar, on the tie beams and in the Stations of the Cross, produce a strong effect and redeem the interior of any feeling of bareness.



Plan of Church at Ramsey, Isle of Man



Tower on West End, Catholic Church, Northfleet, Kent

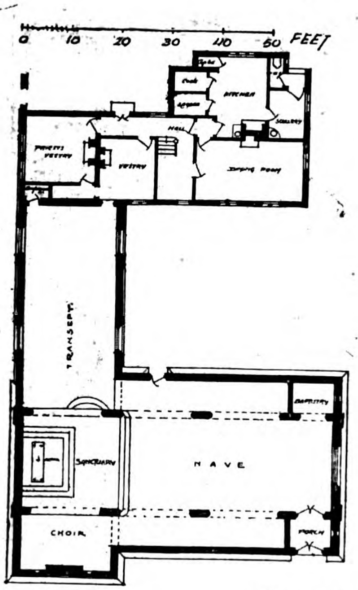


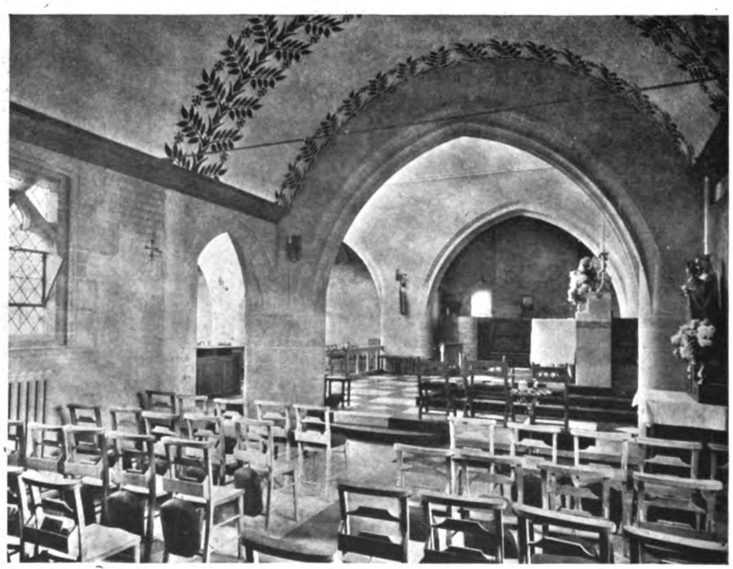
East End of St. Nicholas Church

Another interesting treatment of sanctuary accessories is in St. Mary's Church, Douglas, Isle of Man. Here again the space above the altar is occupied by a triptych, carved, colored and gilded. At the top the ornament takes the form of a "Jesse Tree," a subject frequently worked out in stained glass and sometimes in sculpture. The Jesse Tree portrays the royal lineage of Christ; at the bottom King Jesse is shown and the tree growing from his loins bears many royal figures wearing crowns and bearing scepters, the full flowering of the tree being shown as the Mother and Child at the top of the entwining branches.

While referring to this matter of enrichment it may be interesting to know that Mr. Scott's practice is always to design the details himself. We see in old churches marvelous craftsmanship in wood and stone, we admire the individual touch of the workman, the inequalities in the setting out, the running of the ornament as the spirit moved and not in mechanical repetition of an exact copy. And we may conjure up a picture of a similar thing being done today by the ordinary carver or decorator. But, though there are not lacking craftsmen who could be trusted thus to work out their own designs, disaster would surely follow the giving of such freedom into the workman's hands. In execution his work may be admirable, but he has no tradition of good design behind him as the older men had, and in face of this fact it is best to provide him with full sized details. This is Mr. Scott's custom and the enrichment thus produced has an orderly, definite and logical effect in harmony with the architectural design. In the Golden Age of Art it would of course have been all very different but it is best to frankly acknowledge the conditions which surround us, and to allow the architect to design the enrichment for his own buildings.

A church, more than a building of almost any other character, should be a consistent and finished work of art and such it never can be unless carried out to complete the scheme as it exists in the mind of the architect who has studied and planned it, complete with all its details of structure and ornament.





Floor Plan and Transept Detail, St. Nicholas Church, Sheringham, Norfolk

St. James' Chapel, Cathedral of St. John the Divine

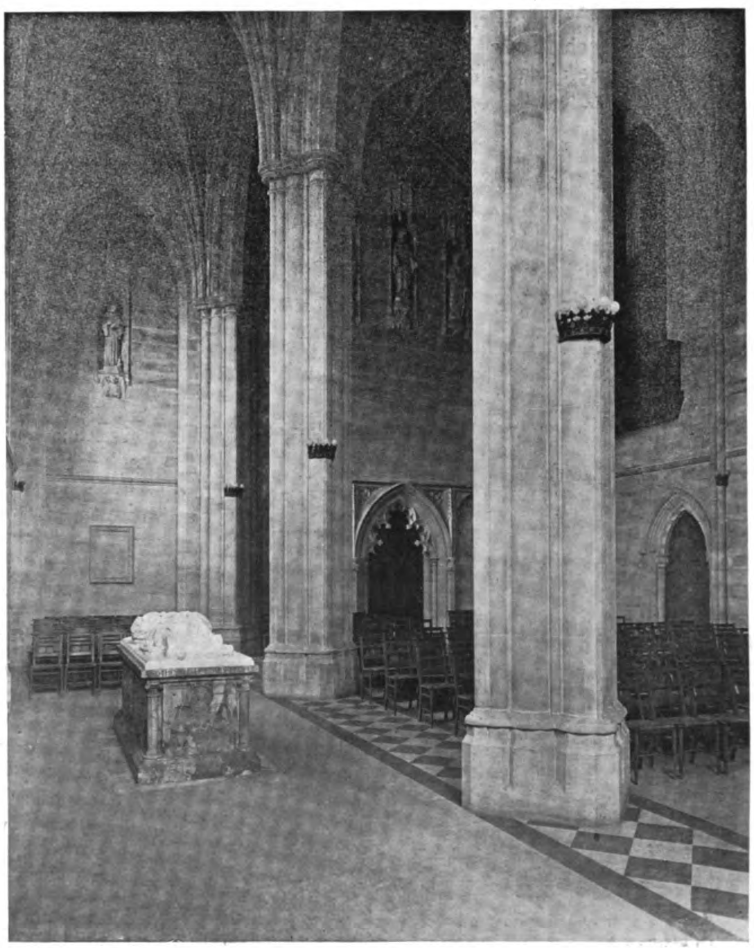
HENRY VAUGHAN, ARCHITECT

SLOW but steady progress on the Cathedral of St. John the Divine marks the passing of the years and already there are certain parts of the vast pile of buildings which have attained what will be their completed form. No part of the Cathedral has thus far been more successful than the seven small chapels,—the "Chapels of the Tongues,"—which surround the choir and sanctuary, each of which has been the gift of some individual or of some one family. To each donor belonged the privilege of selecting the architect for the particular chapel in question, the designs and plans being made subject to the approval of the architect to whom belonged jurisdiction over the entire Cathedral and all of its auxiliary buildings.

The Chapel of St. James, the gift of the widow of the late Bishop Henry C. Potter and her children, is by far the largest of these seven chapels and occupies a space at one corner of the Cathedral where the South transept crosses the nave. This position affords access into the transept and also into the wide ambulatory which extends around the choir and sanctuary and from which all the seven chapels are entered.

The architect of St. James' Chapel, the late Henry Vaughan, has well utilized the small space at his disposal and has created a work of great architectural dignity and of a well restrained character which is in thorough accord with its highly architectural surroundings. Owing to the small area of the Chapel Mr. Vaughan very wisely emphasized its height, with three richly traceried windows filling the three bays of the wide aisle which the peculiar position of the Chapel made possible. Balancing the bay nearest the altar the space which opens into the ambulatory gives something of the effect of a transept which materially increases the width at this point.

St. James' Chapel is now complete excepting for the stained glass which is to fill the three large windows. Like other parts of the Cathedral the walls are of stone, the floor of marble and the roof is vaulted. It is the only chapel of the seven to include a small but well appointed choir and it has its own organ, set within a chamber in the thickness of the wall and high above the floor near the West end of the Chapel. Above the altar is placed a richly carved reredos with canopies above a sculptured portrayal of the Transfiguration and tall statues of the Evangelists with their appropriate emblems. At either side of the reredos are smaller statues in niches representing St. Augustine of Canterbury and St. Gregory the Great while further above and at either side of the stained glass window are statues of St. Peter and St. Paul. In the front of the mensa, or altar table, is placed a sculptured representation of the Last Supper. In the wide aisle of St. James' Chapel is placed the tomb of the Bishop, the recumbent effigy showing him vested in the robes of his episcopal office.



Tomb of Bishop Potter in Aisle of Chapel

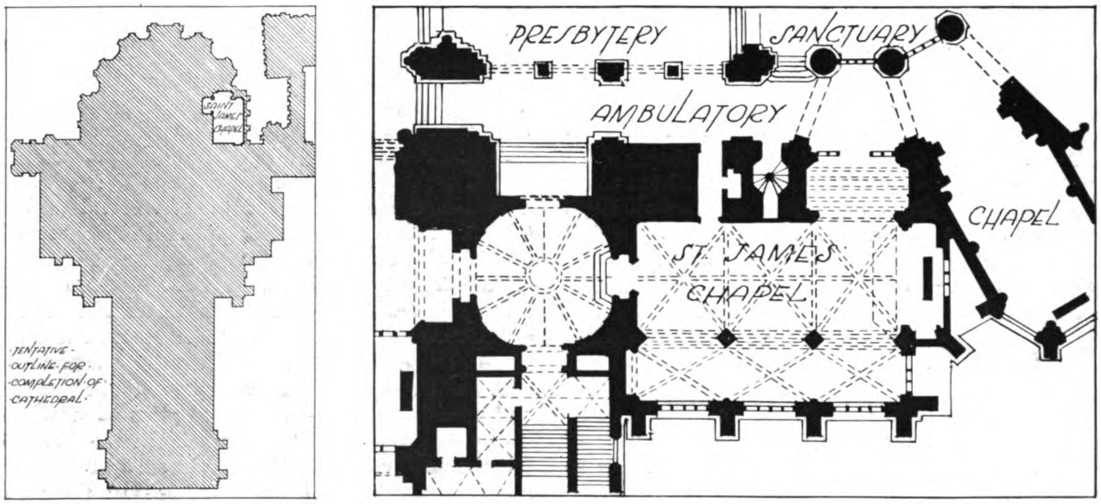
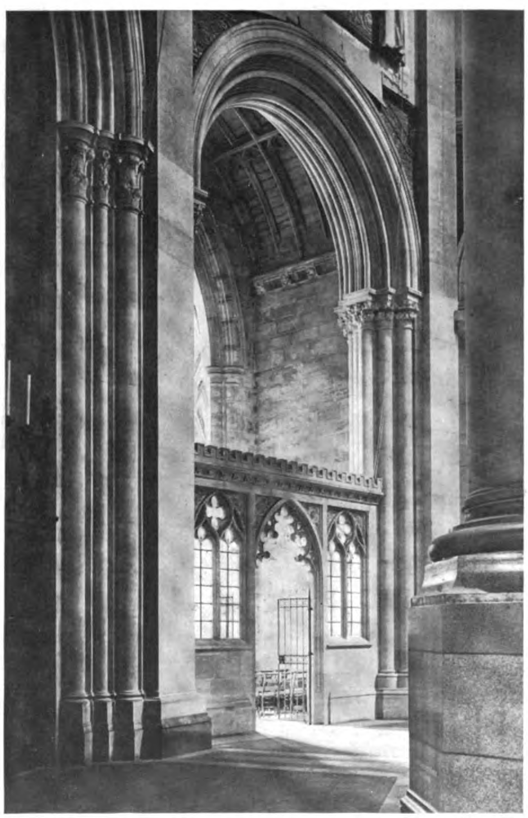


Diagram of Location in Cathedral and Detailed Floor Plan of Chapel

Most of Mr. Vaughan's churches include very carefully designed details of structural ornament and very interesting furnishings and fittings. In addition to such decorative details of St. James' Chapel as have already been mentioned there are important accessories in the carved stone screen which separates the Chapel from the choir ambulatory and various niches in which statues are placed under Gothic canopies. A very interesting example of this treatment occurs above the door leading from the end of the Chapel into the close where three niches and statues are grouped together. Some very successful details of wood carving are the ends of choir stalls, the lecturn and the case for the organ with the tiny gallery for the organist.

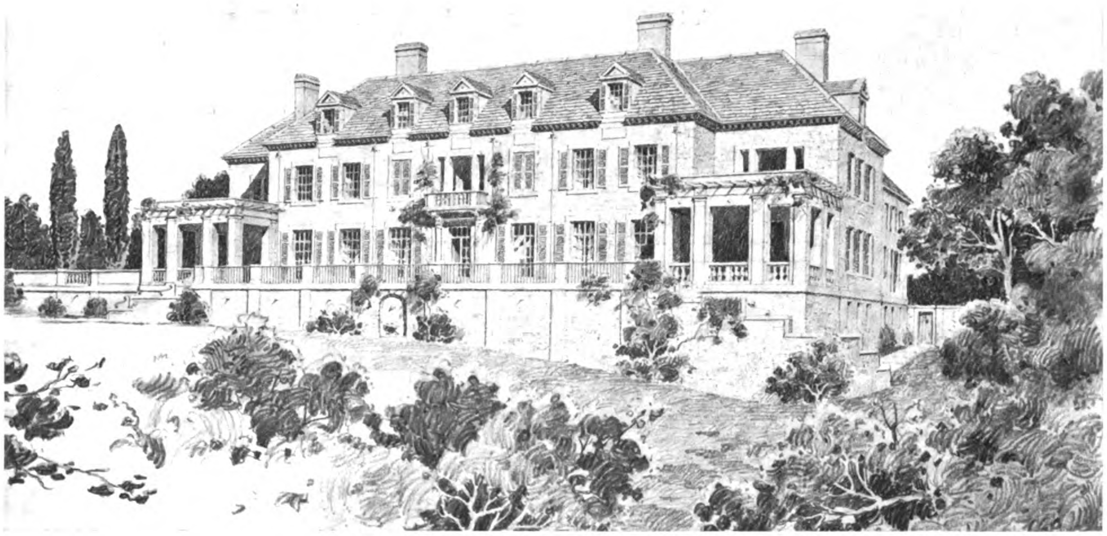


Screen at Ambulatory Entrance to Chapel

These various small chapels which cluster about the choir and sanctuary of the Cathedral have been planned for the holding of services of the Episcopal church in various languages which accounts for their being called the "Chapels of the Tongues." The dedications of the chapels may be regarded, to a great extent, as suggesting the languages used in the services therein; German is obviously the tongue suitable for the Chapel of St. Boniface, French for that of St. Martin of Tours, Italian for St. Francis, while Spanish might be the language employed in St. James' Chapel. The decorative accessories in these chapels relate, in each instance, to their dedications. Such details as sculptured adornment, stained glass and screens or grilles of metal have been planned to embody symbolism of an appropriate kind.

Rich opportunities have been offered in these small chapels for the successful use of glass. In each instance a considerable part of the walls is made up of large windows and the great openings have made possible the use of small medallions which in many instances show scenes in the lives of the saints to whom the chapels are dedicated.

The exterior appearance of these various minor chapels is especially interesting, for they are all very slightly different and their comparatively moderate dimensions tend to emphasize the great height of the body of the Cathedral which towers above.

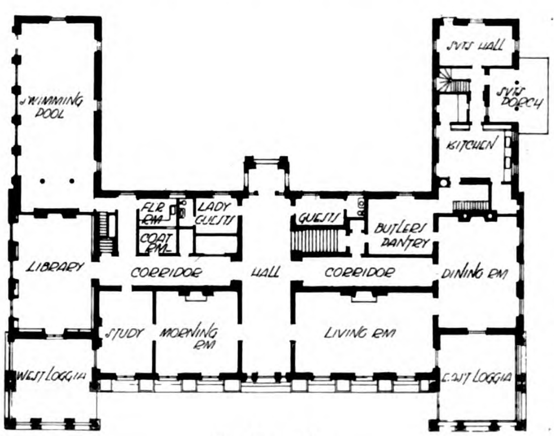


A House at Mount Kisco, N. Y.

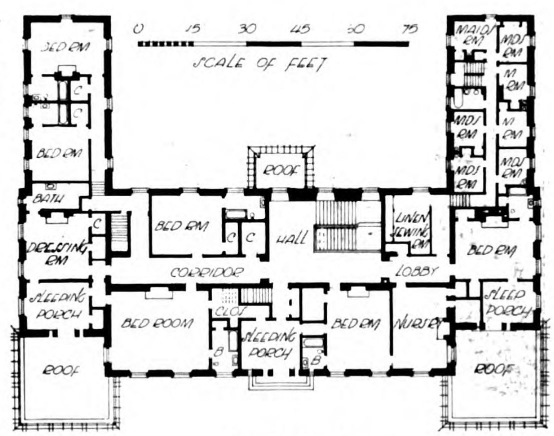
THE RESIDENCE OF EUGENE MEYER, ESQ.

CHARLES A. PLATT, ARCHITECT

TO Charles A. Platt is in large measure due the credit for the very great stimulus that has brought American country house architecture to the high standard it holds today and to him are directly attributable some of the most stately and beautiful homes in America, which with their garden settings rank with English country places that for many years have been recognized as the finest expression of domestic architecture. Mr. Platt enjoys the distinction of having been a painter and etcher before he began the practice of architecture. He is endowed with the powers of the artist as well as the architect, and it is therefore not strange to find his architectural works characterized by a careful regard for line, subtle color and charming relations between setting and structure. He entered upon his work as a designer of houses at the time interest in country living began to assert itself as an American quality and his early houses which were designed with a fresh memory of previous study of Italian gardens and villas, established a standard which has exerted a marked influence on domestic architecture. In all of the many houses he has designed there is a consistent element of fitness to site and a remarkable measure of restraint in the use of architectural motifs and decoration. These



First Floor Plan

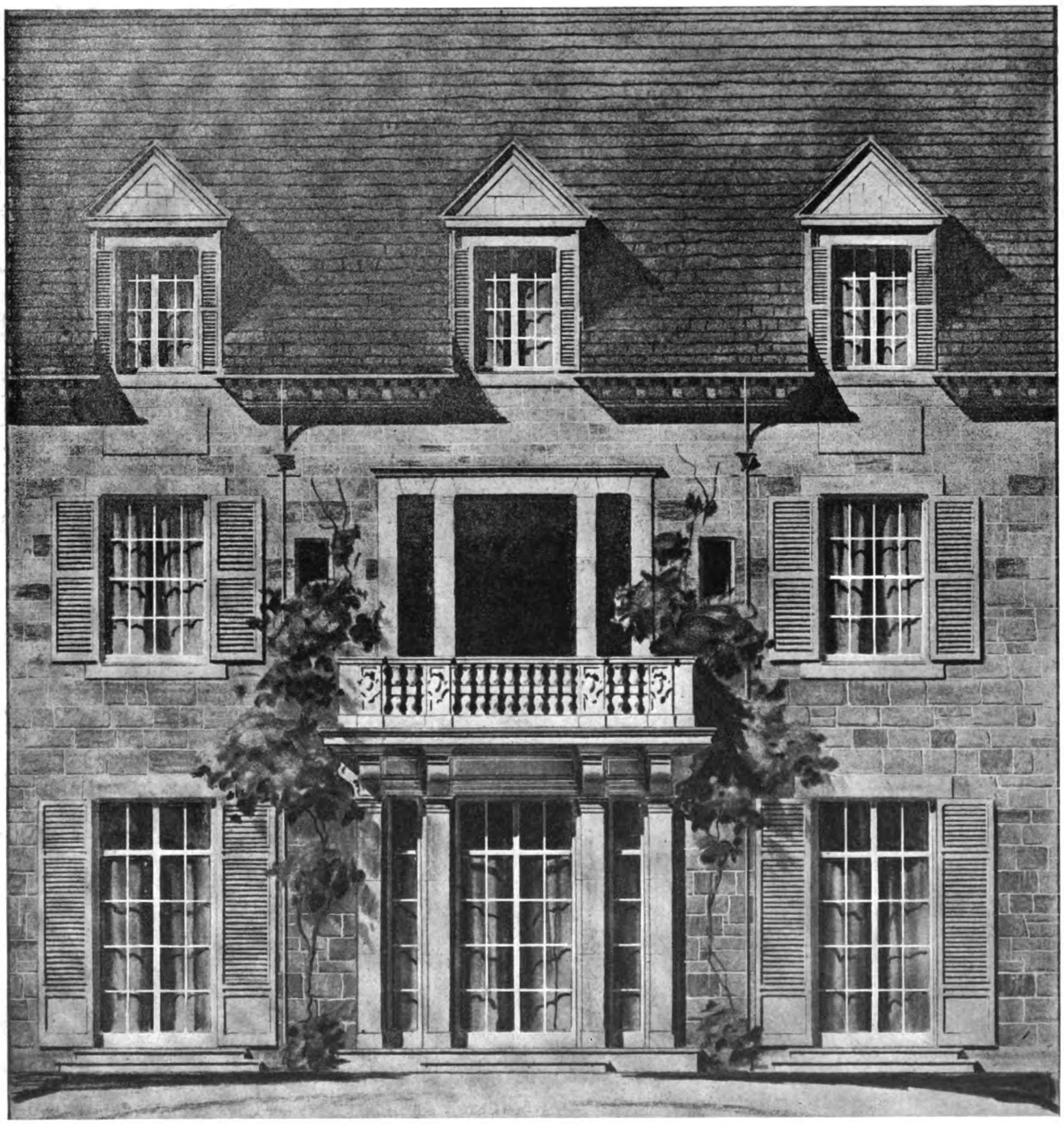


Second Floor Plan

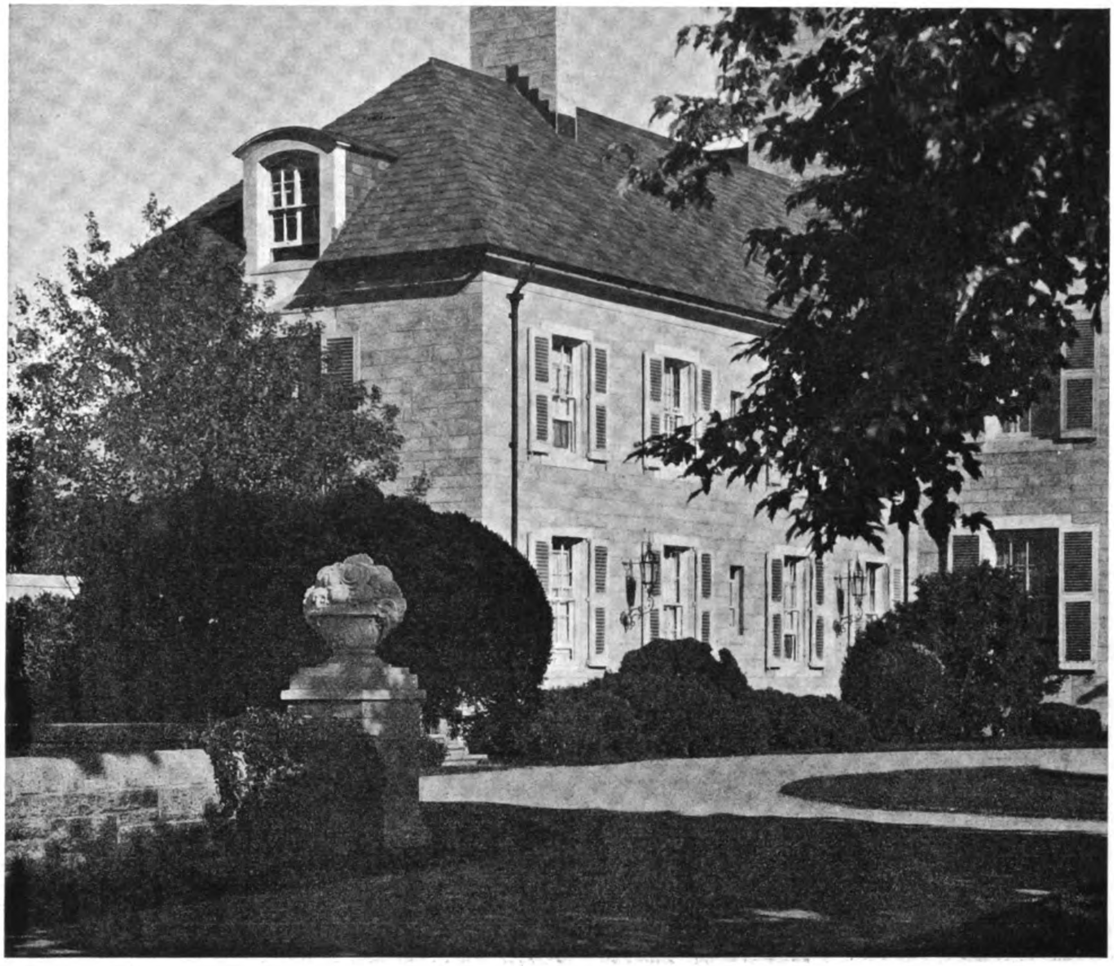
houses while in most cases composed on a large scale have in them a great simplicity and homelike character. They are always formal, but their symmetry is never dull, it is tempered by a perfect understanding of the art of fitting the building into its surroundings, and by a sure handling of the color and texture of materials. His designs are perhaps of the greatest interest in their proportions and beauty of line; this is accomplished not through applied decoration but by the most honest and straightforward expression of form.

In the house for Eugene Meyer, Esq., at Mount Kisco there is seen a recent example of Mr. Platt's work which is quite distinctly different from his other houses. It has the breadth and distinction of the Italian which underlies all of his work—there is, however, little that can be definitely labeled as Italian—one feels perhaps a stronger suggestion of French inspiration; it is truly derived from no single precedent, being rather the product of intelligent eclecticism which insures a quality of refinement because of the background provided by the appreciation of all that is good in architecture.

The planning of this house presented a most interesting architectural problem. The site is on very high ground overlooking a wide expanse of woodland, the fall being very abrupt from the terrace to the south of the house. The comparatively



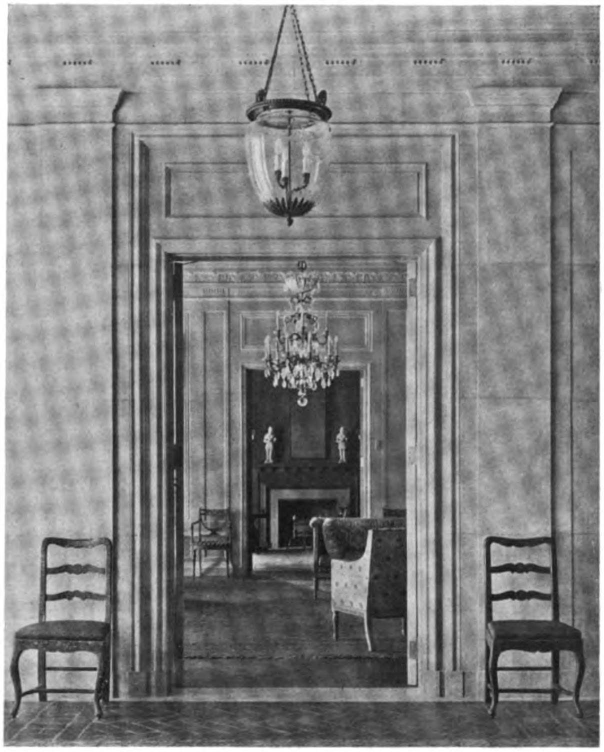
Charcoal Study of Central Motif on Terrace Façade



CORNER OF FORECOURT AND SERVICE WING

NORTH OR COURT ELEVATION

HOUSE OF EUGENE MEYER, ESQ., MOUNT KISCO, N. Y. CHARLES A. PLATT, ARCHITECT



Hall Doorway to Morning Room

level area for the house, garden and approach was limited and an examination of the plot plan on Plate 50 will show how ingeniously this has been utilized to provide the essential features of a country place.

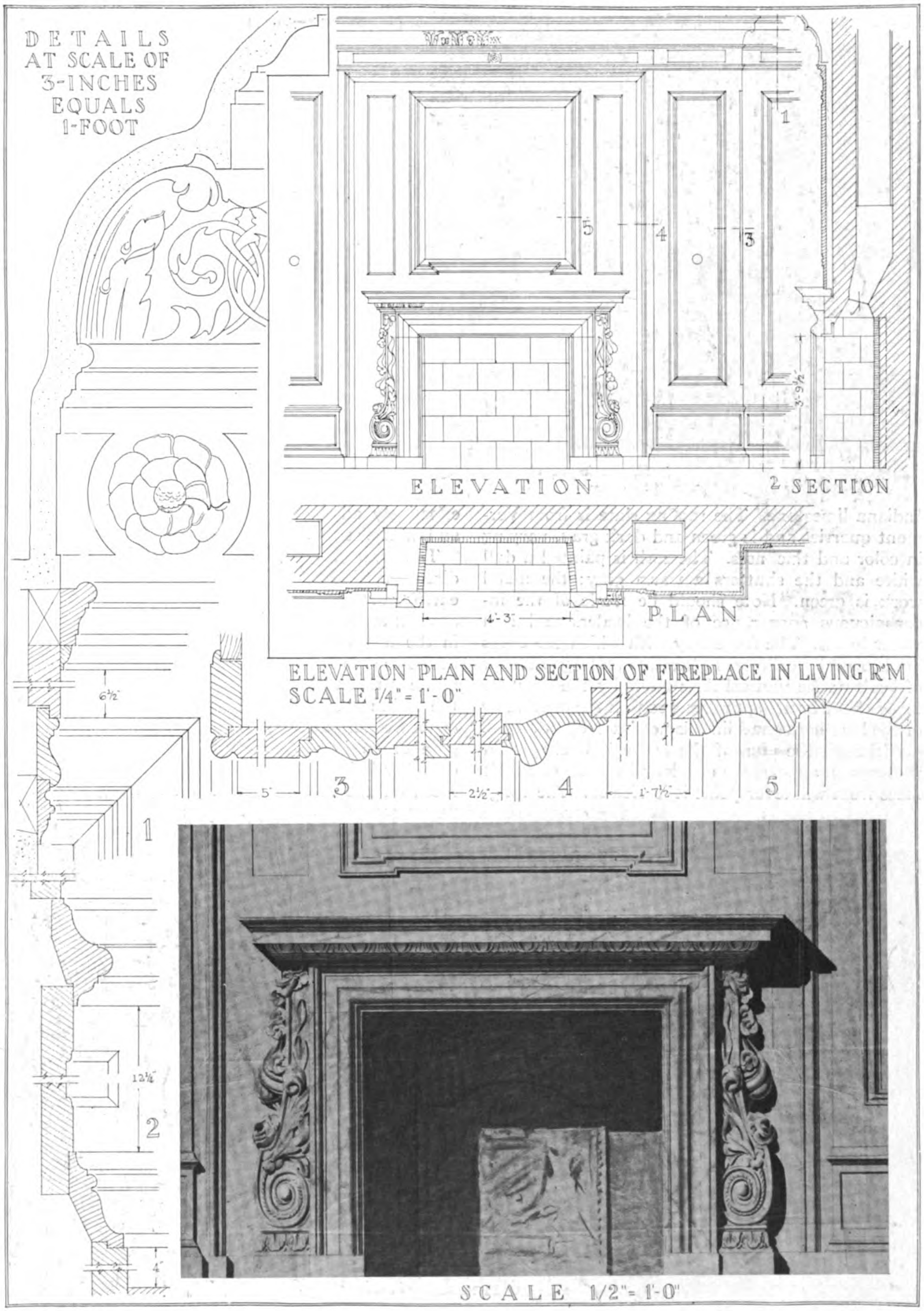
The approach to the house is from the north. A gently rising and curving roadway leads to a low walled forecourt approximately 100 feet square, the grade of which is but a step or two below the main floor level. The low and irregular planting of box along the base of the walls, the great breadth of the façade and the low-roofed wings on either side make a charming ensemble. There is nothing to detract from the simple dignity of the beautifully balanced disposition of windows and wall spaces, the entrance doorway bearing the only note of accent save the artistically wrought lamps that hang out from the forecourt walls of the two wings.

Morning Room toward Living Room

The south side of the house has been located on the very edge of the slope so that all the available level space is given to the garden at the right of the forecourt. This has considerable area and is treated in a simple, open manner to increase the apparent size. The main axis runs north and south terminating at the northern end with an orangery and the wooded slope at the south. The cross axis is the same as that of the forecourt. Access to the garden from the house is through the library windows, which open on to long, low steps.

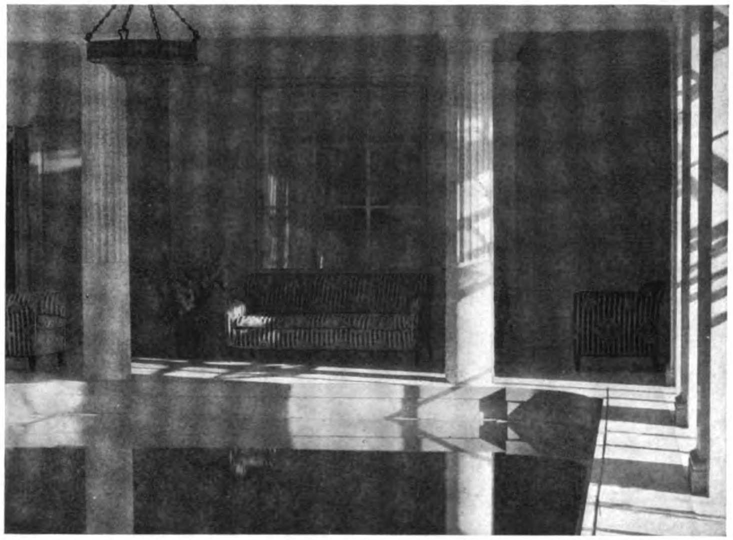
The land falls away at the east again which made it possible to arrange some of the service features in the basement, and a branch from the main drive leads to the service court at the basement level. The grade about the opposite wing is only a foot or two below the floor level. The swimming pool which occupies the lower portion of this wing is lighted by a row of windows opening to the floor and about nine feet high. These windows overlook the garden and the great expanse of glass gives the pool practically the effect of an outdoor location.

The exterior walls of the house are built of local granite that was quarried on the property, most of it coming out of the site of the house. It is a warm gray with considerable variation in graining and in tone. The stones are sawed square and vary slightly in size; they are laid in the wall in random-coursed ashlar. The cut stone cornices, columns and window trim are



DETAILS OF LIVING ROOM, HOUSE OF EUGENE MEYER, ESQ., MOUNT KISCO, N. Y.

CHARLES A. PLATT, ARCHITECT



Detail of Swimming Pool

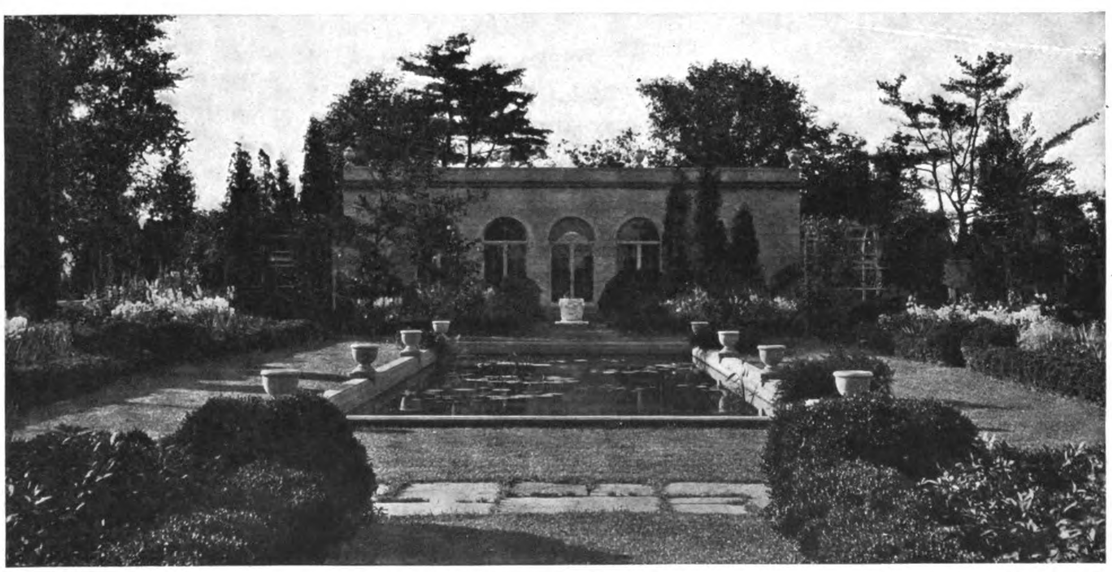
which form the forecourt are kept low and the long dominant main roof line rises above them, emphasizing the main mass of the house which is some 143 feet long. The large scale of the main block can be appreciated by noting that the wings contain three stories in less than the height occupied by two in the main portion.

The care with which the architect considers scale is illustrated by the loggias at the ends of the south front. The openings are about 14 feet high which accord well in scale with the house as viewed from the exterior. From the loggia itself these openings appeared too high and a wrought iron grille of pleasing curves was arranged in the upper portion which effectively adjusted the relation between exterior and interior scale.

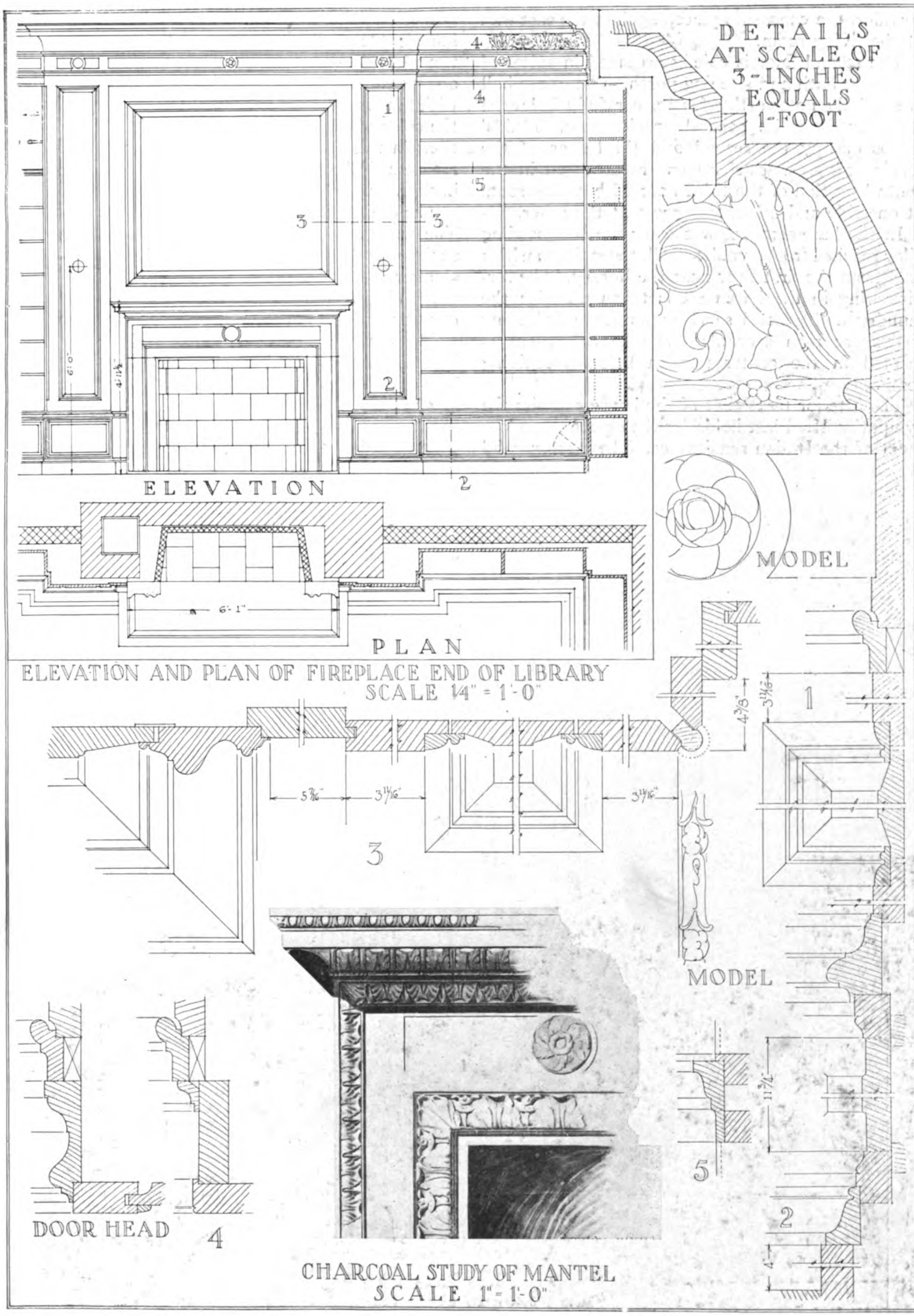
Indiana limestone. The roofing slate is from Vermont quarries and is green and dark gray, varying in color and thickness. The sash is painted a dull white and the shutters a warm gray; the metal work is green. Note should be made of the inconspicuous appearance of the leaders and rain water heads. The frequency with which the eaves are broken by dormers necessitated a large number of leaders; the vertical lines made by them on the façade have been kept narrow so that the continuity of the long horizontal lines is not interrupted.

Although the plan of the house is U shaped, it presents an appearance of a long building of simple mass from whatever point it is viewed. The wings

The arrangement of the floor plan is simple and direct—a wide central hallway unbroken by stairs extends through the house to the terrace. Corridors at right angles to the right and left bring the rooms in the wings into easy communication with those in the central portion. The entire north side of the house is taken up with service quarters, so that all the main rooms are so placed that they have sunny exposures and a command of the distant views. A pipe organ is a feature of the house; the tone chamber is in the space adjoining the ladies' coat room on the first floor with an opening into the



Orangery and Formal Garden



DETAILS OF LIBRARY, HOUSE OF EUGENE MEYER, ESQ., MOUNT KISCO, N. Y.

CHARLES A. PLATT, ARCHITECT

corridor, the console is placed against the east wall of the living room.

The second floor is chiefly arranged in suites of bedroom, bath and sleeping porch. The upper hall is specially noteworthy for its carefully balanced treatment and its general spaciousness. Maids' rooms occupy the second and third floors of the service wing. Guests' rooms are arranged in the central portion of the third floor with a play room at one side and a lounging room at the other.

In the basement below the terrace is a bowling alley reached from a vaulted hall, the stairs to which lead from the first floor near the library. The service wing in the basement is taken up with the laundry and general service quarters and sleeping rooms for men servants. The heating plant is located in the center portion below the living room.

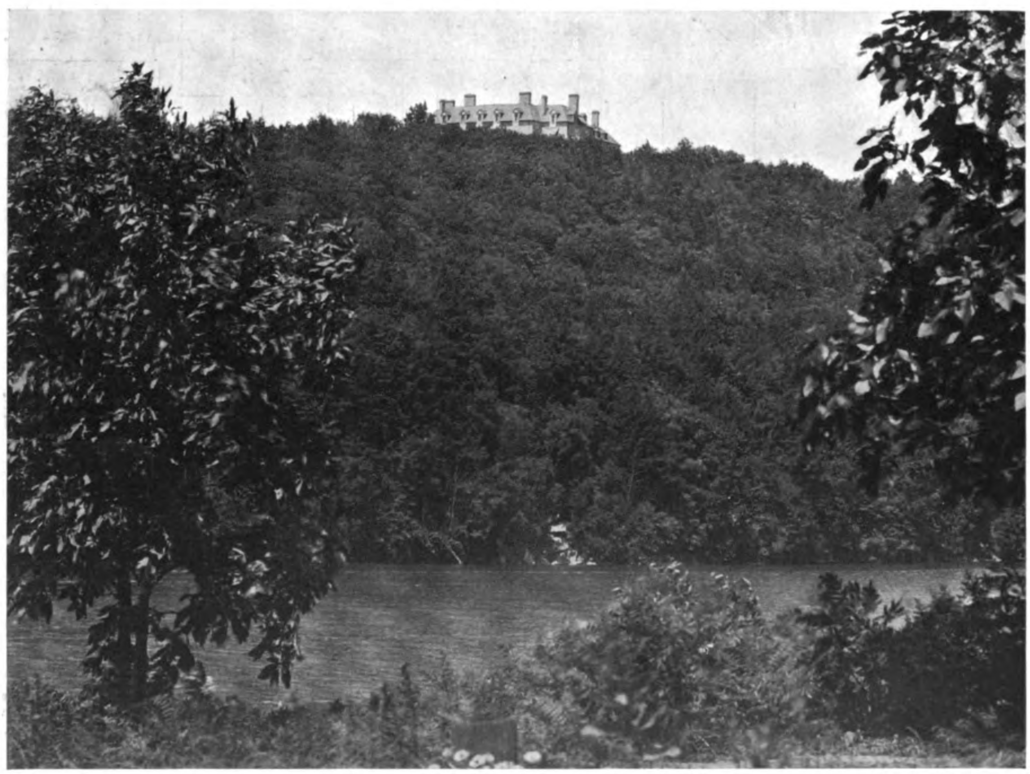
The interior treatment of the house exhibits the sympathy Mr. Platt holds for the ordered development of the Italian renaissance. The same careful regard for proportion and restraint in the use of ornament that is characteristic of his exteriors is equally evident in his interiors. The largest and most imposing room is composed of simple elements; nothing is introduced that would impair the sense of refinement and homelikeness which pervade all his interiors.

The walls of the entrance hall and the staircase are of Indiana limestone, the surface of which is honed; the floors are of special hand-made tile, waxed and polished. The living room is a large apartment simply treated with broad plaster panels with low wooden wainscot and wooden mouldings, the color of which is warm gray. The wall decorations in this room as well as in the morning room are beautiful Chinese paintings, the wall color or background being complimentary to the paintings.

The dining room is carried out entirely in marble. The walls are of deep Istrian marble with honed surface and the floor is paved with alternate squares of black Belgian and Istrian marble. The mantel is an Italian antique of vigorous design and dark brown from age and discoloration.

The library walls are low toned English oak with book shelves covering a large part of the surface. The mantel is of kingwood stone.

The details and office sketches reproduced herewith are of special interest in showing the way in which design is studied in Mr. Platt's office. Ornament and mouldings are studied in large scale charcoal rendered drawings which give an effect approximating modeling. In addition actual models are made and submitted for criticism of all carving on mantels and ceilings. In many cases these models include the mouldings of adjacent wall panels so the finished effect of the combined details may be readily determined in advance.



View of House from the Valley

Interior Woodwork

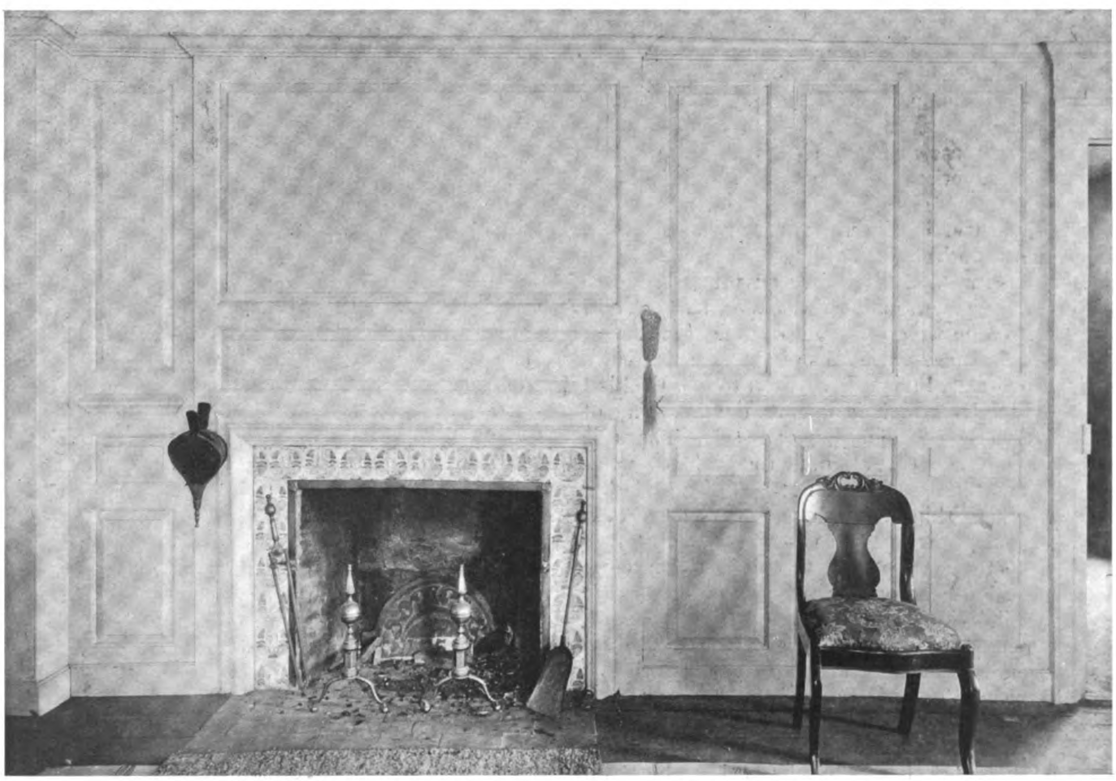
THE DEVELOPMENT OF THE NORTHERN VERSION OF THE COLONIAL

By RICHARD B. DERBY

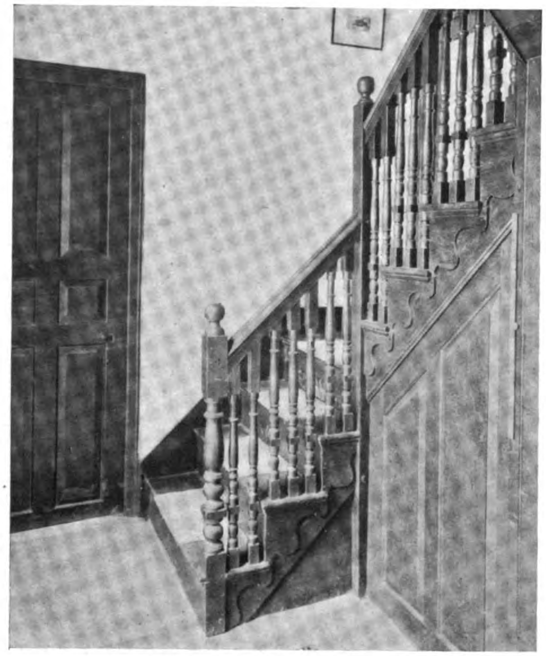
WE usually distinguish the several stages of our Northern work by marking it off into periods as the Gothic, the Georgian, the Roman, the Greek, etc., or as the first period, the second period, the third period; but our period divisioning is arbitrary at best and merely serves, like railroad stations, to note the direction in which we have been traveling. It is desirable, if only for the sake of variety, to look at our architectural development from another point of view. It is even possible that the new point of view may be fundamentally better than the old. Certainly it is better to recognize the various changes at briefer intervals than those marked by the so-called periods, and to do so it is only necessary to think of them in terms of construction instead of in terms of style as is commonly done. Inside finish, whether taken as a whole or in parts, notes this progress of development by many and intimate steps which relate themselves (at any rate in the earlier work), almost more intimately to the changing types of construction than to the changing styles.

The construction of our houses from the Gothic period to 1800 varied from time to time in almost all particulars, but there is one time, which can be more or less clearly stated, at which it ceased to be definitely one kind of construction and became definitely another kind. The first was of a kind either wholly or partly exposed to view; the second was of a kind wholly concealed. The first originated with our earliest houses and continued until the modern method had standardized all the members. Our first walls were posts, girts, girders, etc., with merely a filling between. Modern walls are a collection of studs reinforced at the corners. This, of course, omits from consideration brick and stone structures.

Finish applied to the early construction may properly be called native. It was even a kind of opportunist's finish in which the workman took advantage of this or that accident, or allowed himself to be forced in this or that direction by conditions. The bulk of the finish in the early houses was little more than the construction itself. When more finish than the mere construction was needed, the carpenter took occasion to give his special imprint



Room in the Hannah Robinson House, Saunderstown, R. I. Built about 1750



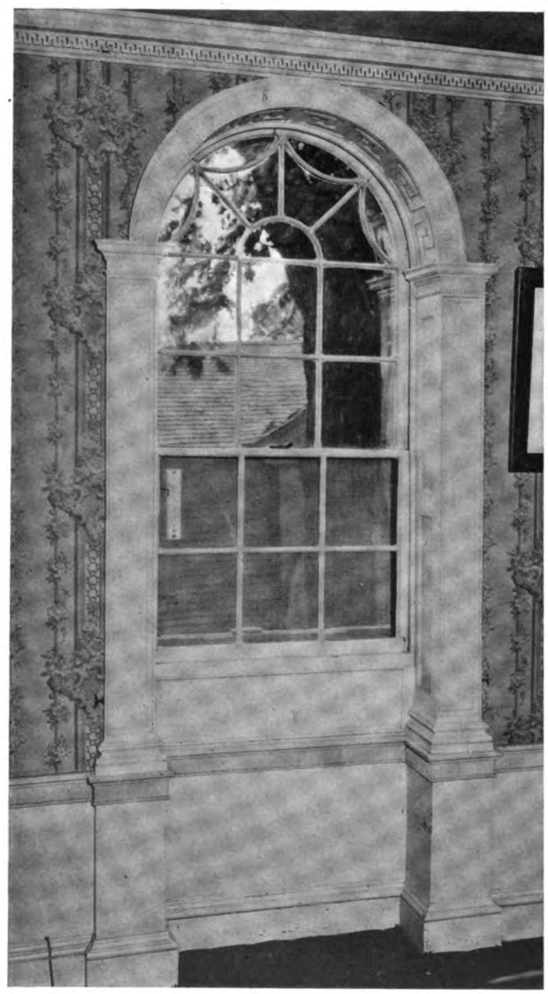
Stairway, Hancock-Clark House, Lexington, Mass.

to the parts he himself supplied. There was, of course, a general tendency of direction which was adhered to by everyone, but there was ample opportunity for the individual workman to apply his own ideas without any interference with this. As a result, we have in this earlier work a finish which supplements, while adapting itself to, the construction and is at once the expression of common general ideas, and of the ideas of the workman.

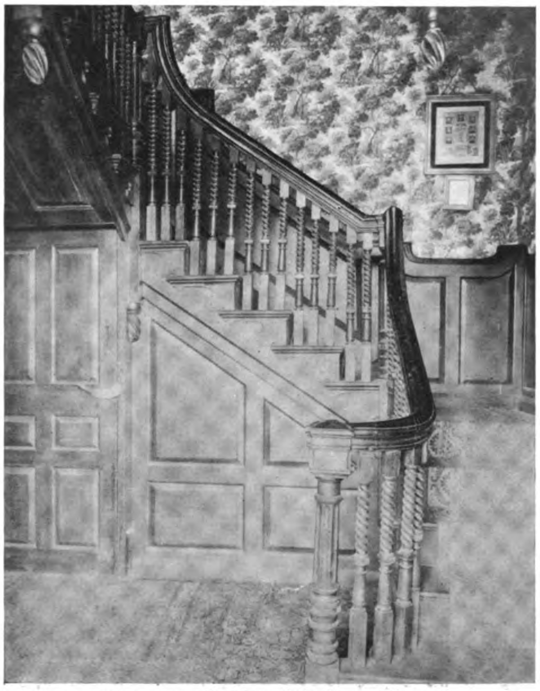
The characteristics of this work are those of an unsophisticated art. Chief among these are freshness and virility. The interest attaching to this work is not due to fine relations of mass or to refined proportion of parts. It is rather an interest due to qualities of charm, quaintness, flavor, naïveté, and the like. When we go into one of the old rooms we expect to find new variations of the characteristics which we already know. We expect to find the kind of individuality which is due to the handling of parts rather than the handling of a style. The style was imposed by construction, methods of workmanship and materials. It was not less of a style because of these things. Perhaps it was more of a style. Certainly it was more indigenous. But over and above the interest due to this is the interest due to accident and opportunity, taken advantage of by the individual workman.

It is perhaps hazardous to give an exact date to the time at which the unsophisticated workman gave place to the designer. The general practice probably began about the middle of the eighteenth century. But the line of demarcation between the two kinds of work, even though it cannot be given a definite year, is clearly enough perceivable in the work itself. It is, of course, at that period when the old construction passed completely over into the modern construction. At this time inside finish ceased to be the complement of construction and became an applied product. The wall beam, whether cased or not, disappeared within the wall or floor of the house, and the cornice which was nothing but a cornice took its place. The corner post likewise disappeared. The door frame became purely a door frame and was no longer a part of the architrave. The minor ceiling beams, originally exposed, passed through the stage of being concealed above plaster; and then the summer or main beams underwent the same change, until the plain ceiling only remained. When the construction had thus been entirely reduced to its modern equivalent, walls and ceiling alike became an open page on which the new designers were to write.

The new designer began his work with the study of the classic. His first attempts were rather unfortunate from the domestic point of view. He was too much in the position of the man who loves art



Stairway Window, Pierce-Nichols House, Salem, Mass.



Stairway in the Hannah Robinson House

for its own sake and who doesn't realize that the only right use of his knowledge comes at about the time he is able to forget that he has it. His first work was cold, formal, precise, heavy and barren. He was no doubt in sympathy with his art, but he was not, as artist, sufficiently humanized to be in sympathy with the use to which it was put. His rooms were unhomelike and pretentious; but he worked with a formidable and increasing knowledge.

The new American classicists started their career with a study of the orders; not the orders as taught today, perhaps, when they are put before the student in such a way as to serve as a comprehensive background for architecture in general. Now we are taught all the variations which the several nationalities using them gave to all the orders. But our first students gave their attention almost exclusively to what might be called Roman work; and what they attended to as students they applied later (or simultaneously) as designers. Consequently we have in this early period of genuine design, a style of finish which partakes so strongly of Roman influence that it is not unreasonable to call it the Roman style.

The old construction having been superseded by the new, the designers had now a clear track for the application of their new finish. There were no embarrassing eccentricities of plan, no beams to be worked in as members of a cornice; no interrupted corners. Their only limitations were the sizes of rooms and the door and window openings. The size of a room was indeed a handicap and, judged by the early failures to design homelike interiors, it must have been insurmountable. Their task was to adapt their ponderous and formal prototypes, appropriate enough to the life of classic Rome, to the intimate and friendly use of the colonies.

The general effort simmered down to the particular attempt to make the order fit a room. This, the order, was what the designers chiefly worked with. They spread it, literally, around the room. The pedestal, instead of being a vertical motive, basing a column or a pilaster, became a horizontal motive, a dado, to be measured by the yard,—this in addition to its occasional use as a pedestal. The columns and pilasters, taken from massive rotunda or portico, were arcaded on the walls, at the corners of the room and on either side of the fireplace. The original powerful entablature was as powerfully employed as possible, the cornice given full scope, the frieze and architrave abbreviated to do duty, and

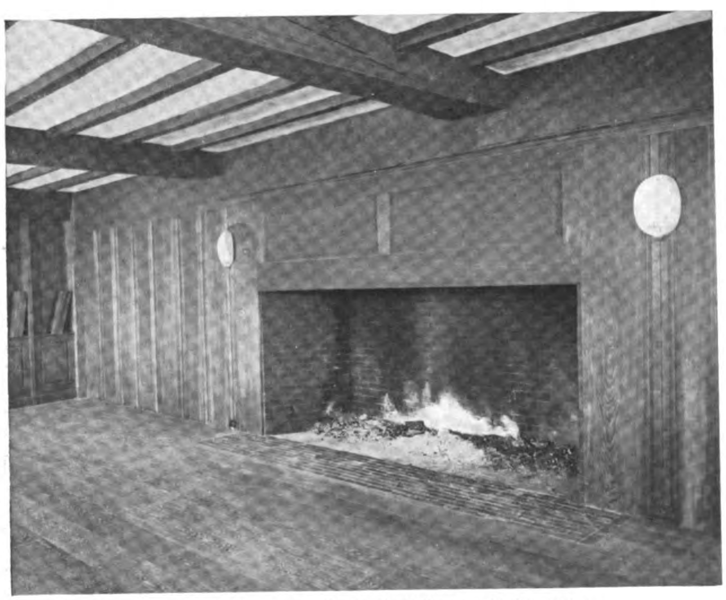
Stairway in the George Cabot House, Beverly, Mass. Built 1783

Stairway in Present Day House at Newcastle, N. H.
Little & Brown, Architects

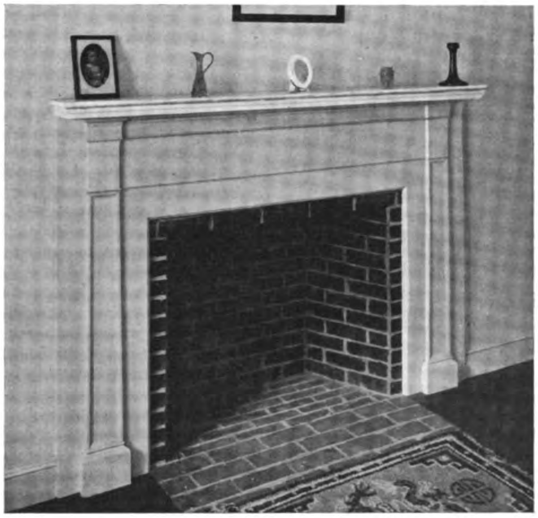
echo their source, above the shaft. This is, perhaps, to satirize the new movement a little. Certainly the weight of the prototype persisted in the adaptation and especially in the details. There were the strong base of the dado and the strong cap, with its projection, like that of its original, of 45 degrees; and there was the resulting necessarily strong projection of the architrave to receive the cap and base. Other details were similarly strong and heavy and the total effect was the effect of architecture and, for its special purpose, architecture misapplied.

But the path of the beginner, and especially in art, is not easy; he meets with many obstacles not encountered by his successor, and his work as done becomes a guide, both negatively and positively, to the man who follows him. The designer of finish as an applied treatment in a room had a harder row to hoe than the man who added finish as a complement to structure. He had to give up charm and quaintness as qualities in his work, qualities which to the early workman were almost accidental, and seek for and consciously exemplify other qualities which should give his work a standing. He turned naturally enough to the prototypes in which these qualities were to be found, but he had to find the qualities out and, having found them, to adapt them; and in adapting them, however unsatisfactorily, he initiated a new art and took the first steps along the road since followed.

The interest in finish from this time on is primarily the interest due to design. We turn from the quality of casualness to the quality resulting from proportion and mass, and to the quality of detail as applied with these in mind. And, this primary source of interest granted, there is a secondary interest in any study of the later development in following the increasingly better adaptation, in the use of design, of means to ends. Used at first for its own sake, design was, in result, merely architecture; but in proportion as the designers mastered their art their work ceased to be inappropriate and extraneous. The Roman influence persisted, only it was more and more modified to the purposes in hand. There was a gradual reduc-



Detail of Restoration Work, Old House at Bolton, Mass.
Biglow & Wadsworth, Architects



Example from Late Eighteenth Century Precedent
Derby & Robinson, Architects

tion in the amount of finish used, a better studied and more appropriate placing of what was used and a tendency toward refinement in the use of detail; the whole development reaching its culmination in the work of 1800 or thereabouts.

The best work of this time,—covering fifteen or twenty years,—is the final and perfect achievement of colonial architecture as a style. The artistry which has been struggling upward for half a century finds its complete manifestation in this work. Design, as applied to finish, is still recognized as a thing in itself, but it is recognized as something more than this. It is a self-conscious art, an art which knows itself and knows what it can do, and more than this, an art which does what it should do. It recognizes as a fundamental purpose the adaptation of itself to the purposes in hand. It is no longer clumsy in adaptation of means to ends. Its results are appropriate. As this is true in general, so it is true also in detail. We find that the details are worked out according to exact standards and may be adapted with accuracy to different proportions. The same design of an architrave, for instance, which is used for a small door may be used for a large door by a definite method of proportioning parts; that is, it is not necessary to re-design the architrave. Similarly with other details. Having cultivated design to this degree it is natural that the architects should have wished to preserve their work in records, hence we find books in which these are preserved like the books of Asher Benjamin. The inevitable result of this, of course, was a speedy decline in the quality of work. The records were put to an artistically unintelligent use and became ultimately "rules of thumb" for the untrained. In other words the 1800 work, reduced to a technique, foundered on its own formulæ.

From any simplified general statement, such as we are giving, much important matter is necessarily omitted. In order to cover the development thoroughly it would be necessary to examine the work at frequent intervals. If this were done it would be found that for each stage there were numerous variations of the type. These would vary from the simplest to the most complex design. At every stage, however, two leading variations will be found. The one might be called the "country gentleman" variation, the other the "town house" variation, or, as it might otherwise be stated, the "simple style" and the "grand style." Perhaps the most profitable periods at which to study these two leading variations would be about 1775 and then again, of course, at 1800. In 1775, the differences will be much more strongly marked in the matter of design than they are in 1800, but in 1800 the design will be noticeable for its just adaptation of proportions. The simpler type of 1775 was still strongly influenced by the older work; the Roman overtook it more slowly and less completely than it did the grand style of the same period. Partly this was due, no doubt, to the relative amount of money

Modern Use of Simple Rail and String Detail
Howell & Thomas, Architects

on hand in the two cases, so that we find the grand style more portentously Roman than the simpler style. This was not true of the 1800 work. Here the design is as clearly marked in the simple as in the grand style.

This paper is concerning finish as it developed in the North, and the development as outlined bears this purpose in mind. Certain tendencies and influences are common for all parts of the country, but these are subject to the variations which the different localities impressed upon them. The earliest, or Gothic work, is pretty much a product of New England. At any rate the numerous examples still standing in New England give to this section of the country a strong claim to the style. This is explained, of course, by the fact of earlier settlement. The middle and Southern states had no strong headway in a given direction, such as New England had, when the classic influence made itself felt. For this reason the Gothic work, and the development out of it toward the classic, is pretty much a Northern product. But the classic work itself was more hampered in the North by conditions, chiefly climatic, than in the Southern and middle states. In the South the large rooms and high ceilings gave an ampler opportunity for the application of classic finish, and in the middle states too, especially in Pennsylvania, where the Georgian work impressed itself very strongly, and where we still find standing many fine examples from the time of the latter half of the eighteenth century. In the North, with its cold climate, and perhaps narrower means, the rooms were small and comparatively low studded, and the heavy classic detail was much more constrained than in the South. This shows itself, not only in the design of a room as a whole, but in the designs of parts, all of which had necessarily to be scaled down. The fireplace is the single Northern motive which is as large or larger than its corresponding motive in the South or in the middle states.

Modern Colonial work follows Classic tradition, and, for the most part, that variation of it which might be called 1800 work. Certain of the details and much of the clumsiness of the earlier Classic work creeps into the design of the present day, but generally speaking, it is the 1800 models that are being followed. The result, however, is almost always a debased version of the type. The style, never more in demand than now, must draw more directly and with greater reverence on the old work if it is not to come into disrepute. To prevent this it is necessary for designers to achieve a greater and more genuine interest in their sources of information. There are variations enough in the style to attract and hold the attention of many different types of mind. We cannot, of course, revert, except in unusual cases, to the old form of construction, and the design of our finish must be the design of an applied treatment, but the very old, or so-called native models, need not be altogether neglected on this account.

Living Room of House at Chestnut Hill, Massachusetts, in the Manner of Late Seventeenth Century Work
Derby & Robinson, Architects

DEPARTMENT OF ENGINEERING & CONSTRUCTION

CHARLES A. WHITTEMORE, *Associate Editor*

Tile and Its Installation

PART I

By E. STANLEY WIRES

THE possibilities in the use of tile have never yet been fully developed, and only through proper co-operation between the manufacturer, the tile contractor and the architect can we reach the ultimate extent of its use and a fuller appreciation of its merits and possibilities. In common with the use of other building materials, under conditions which now exist, there are delays and disappointments attending the use of tile. A variety of shapes and sizes and many special forms and designs pleasing to the architect and the owner are unprocurable. These inconveniences, however, are unavoidable and temporary and must be accepted with the hope that the conflicting influences responsible will soon be reconciled.

Tile factories are principally in Ohio and both floor and wall tile, as well as roof tile, are manufactured in this district. New Jersey, Kentucky, West Virginia and Indiana also have factories engaged in the manufacture of tile. The tile men are banded together in an association called the "Associated Tile Manufacturers" and this association is doing all that can be done to further the interests of the tile industry.

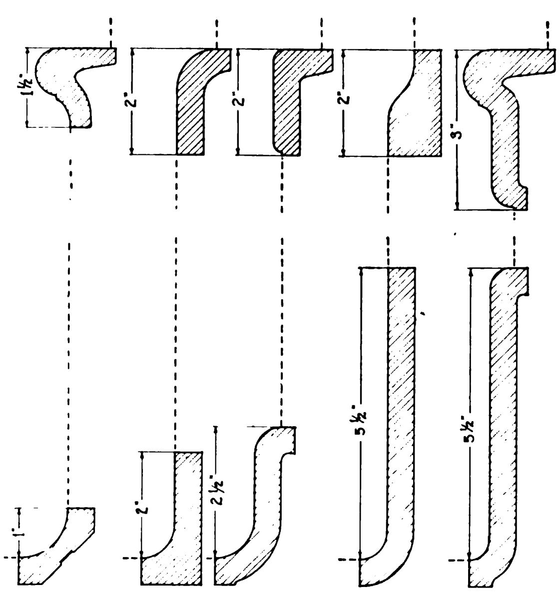
The manufacture of tile requires a variety of buildings and departments in addition to offices and display rooms. Among the principal departments and activities are the clay stock house, the blunging mills and sifting tanks, filtering, clay dry kilns, reduction press rooms, tile drying, designing, packing and shipping.

From the stock room the various materials are automatically weighed into an electric car for transportation to the next department. The clay is subjected to treatments of refining in tanks lined with a heavy insulation of porcelain blocks, impervious to stain. The clay then passes to large filter presses to remove, by powerful compression, the water which must be extracted. When removed from the filter presses, the clay is in a plastic state and all moisture is evaporated in dry kilns, through which the clay cakes pass on cars. These dried cakes are reduced to powder by crushing and sifting and this powder has made possible the clean and even symmetry which characterizes the tile of today.

In the press room this powder is moulded and pressed into shape, and dried on steam drying racks. Placed in special clay boxes, known as "saggers," the tile receives its first burning. Each "sagger" is given a location in the kiln according to a predetermined plan. After burning the tile designed to receive a glazed surface are only partially completed; the unglazed or floor tile have their only firing.

The factories use both a circular oven-like kiln, where the tile remain fixed for a certain period, and also what is known as a tunnel kiln from 200 to 350 feet long, from which a car of tile is drawn every 30 to 50 minutes. Most of the flat glazed tile have the glaze applied by machine, but the more artistic colors and shapes are hand dipped. After a second firing in the glaze kilns the tile are sized and shaded. The white glazed tile go through a machine that automatically stamps each tile with a letter designating a slight change in size, and also stamps the slightly warped tile.

At the present time the white glazed wall tile are classified into three grades, "selected," "standard" and "commercial." These grades are not the result of any intent of the manufacturer to produce different qualities but are the result from the selection made in the product intended to be of the highest possible quality. The Associated Tile Manufacturers have prepared a standard certificate of grade of tile, and such a certificate is sent on request in connection with all tile shipments. On



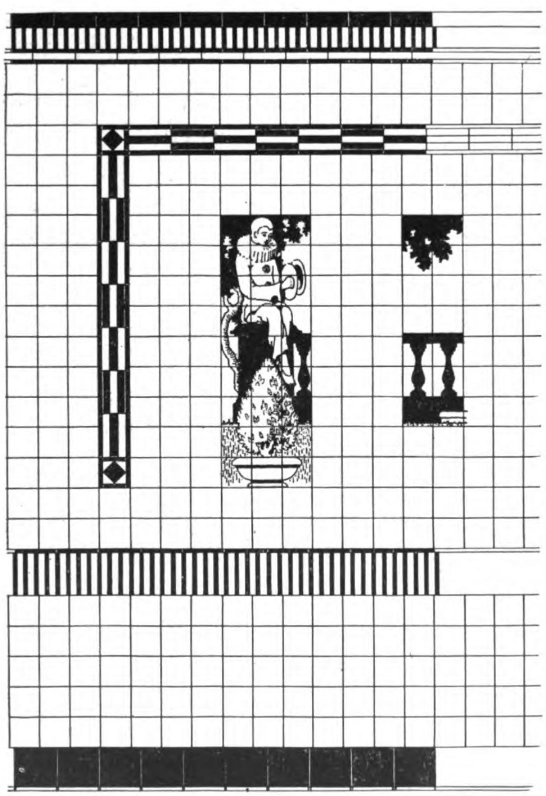
Cap and Base Sections of Standard Manufacture account of the lack of skilled labor and high prices architects should endeavor to use the most economical grade of material suitable for their work.

Wall tile, both white and colored, are produced with a bright finish, in matt finish, and in semi-matt or dull finish. The principal sizes in which the wall tiles are marketed are:

Square		Oblong	
6 inches	9 x 3 inches	6 x 1	inches
4¼ "	6 x 3 "	6 x ½	"
3 "	6 x 2 "	4¼ x 2⅓	"
2⅛ "	6 x 1½ "	3 x 1	"

With the knowledge that these tile are produced in the small units, the architect should be able to design tile wainscots much different from the ordinary stereotyped treatment. The Associated Tile Manufacturers have issued a specification suggesting the use of a few standard cap and base patterns for work of moderate cost instead of the many varieties illustrated in the manufacturers' catalogs. These types, as well as several others of better design, are here shown and can be procured from most of the factories.

The trade term "floor tiles" includes a great variety of sizes and shapes. The unglazed floor tile are classified as vitreous or non-absorbent and semi-vitreous or absorbent, according to the amount of burning they have undergone. The common vitreous colors are white, silver gray, celadon, green,



Wall Treatment Using Plain and Decorated Units

blue and cream. Some of the semi-vitreous colors are buff, salmon, black and red, although several of the reds and browns are very hard and are quite as suitable for any purpose as the vitreous colors, especially as their texture is adapted for such work.

Ceramic mosaic is a trade designation for the tile of the smaller sizes, made ¾ inch square, 1 inch and 1¼ inches hexagon and 1 x ½ inch oblong. These tile are mounted on paper, the square size either straight or broken joint and the oblong size usually in herring bone design. Between these sizes and the 3-inch size, inclusive, tile of the same material are designated as "unglazed floor tile"; above this size, up to 6 inches inclusive, they are known as "unglazed floor tile" if semi-vitreous and as "flint tile" if vitreous.

The principal sizes in floor tiles are:

Square	Hexagon	Oblong	Octagon
6 inches	6 inches	6 x 1 inches	6 inches
4¼ "	4¼ "	6 x 2 "	4¼ "
3 "	3 "	6 x 3 "	3 "
2⅛ "	2 "	3 x 1½ "	

The term "quarry tile" is usually applied to the thicker and rougher textured unglazed tile. There is a great difference in the hardness of this type of tile and those imported from England are not suitable for weather exposure except under most favorable conditions. The principal sizes in this quarry tile are 12, 9, 6 and 4 inches square while oblong shapes are 6, 4½ and 3 inches wide by 9 inches long.

The size 12 inches square is much more expensive than the other sizes. Certain manufacturers of even rougher textured, hand made quarry tile have adopted sizes as follows:

Square		Oblong	Hexagon
4½ inches	2 inches	6 x 2½ inches	3⅝ inches
4 "	1¾ "	2 x 3 "	2½ "
2¾ "	⅝ inch		

"Faience tile" takes its name from the town of Faenza in Italy and is applied to many kinds of decorated, glazed and enameled tiles. These tiles can be procured in practically any size and shape and the important thing to remember is that several months are necessary for the manufacture of this material under present conditions.

Appropriate uses and proper setting of tile are matters usually settled by the architect and tile contractor, and today the contractor has an excellent opportunity to co-operate with the architect and render the benefit of his personal experience as well as that of the manufacturer. He should combine an adequate knowledge of tile and tile design with an intelligent labor organization and should convince the architect that it is to his advantage to deal directly with the specialist. Proper consideration should be given to estimates and designs. A properly organized business is entitled to not only the cost of material, labor and a profit, but also the item of "overhead" covering office and shipping expense, interest, depreciation, etc. Many dealers ignore this and the ultimate result is defective work.

Sprinkler Installation for Fire Protection

PART IV—GENERAL DISSERTATION ON AUTOMATIC SPRINKLERS

By W. D. BROWN, C.E.

CAREFUL planning of a building and a thorough understanding of sprinkler requirements will result in a saving on the cost of the system and will also prevent unsightly breaks in sprinkler pipes.

For example, in planning intermediate partitions it will often be possible to locate them in relation to ceiling beams so as to avoid extra sprinklers. Partitions constructed of wood and glass should, if possible, be so arranged that piping will pass through mullions or mouldings without offsets.

Conveyors, shaftings and other obstructions on ceilings should be considered. Arrangements should be made for openings in foundation walls for supply pipes, sleeves for riser pipes and inserts for hangers.

The wisdom of these considerations can be appreciated when it is understood that all pipes, hangers and other materials are cut especially for each contract and are shipped to the building ready for assembling. In case of a revision at the building a large portion of this material cannot be used.

Underwriters require that plans showing inside and outside systems of piping, also all valves, details of sprinkler systems, etc., be submitted for approval before starting work at the building. Therefore it is recommended that ample time be allowed between the signing of the contract and the designated time for starting work. This period can be utilized for co-operation with other contractors and a careful consideration of the layout with the underwriters and the owner.

PLANS—All features required on a sprinkler layout can be shown on plans drawn to a scale of one-eighth of an inch to 1 foot. In addition to showing floor plans of sprinklers a section through each building should be prepared. Plans and sections should show arrangement of piping together with location of risers, L. T. fittings, valves, tanks, etc. Size and length of each piece of pipe should be marked. The standard practice is to designate the size of pipe above the pipe line and the length below. See Figs. 1 to 4 in the August issue.

Locations of partitions, decks, skylights, beams, columns and all other features necessitating additional sprinklers or causing offsets in sprinkler pipes should be shown. Dimensions such as width of bays, length of building, height from floor to ceiling, thickness and construction of floors, sizes of beams, girders and floor joists, should be shown on plans or sections. Care should be taken in running piping to avoid interference with structural or decorative members of buildings, stairways, stair wells, windows, doors, transoms, etc. Special efforts should be given to avoiding pockets and extra drips. A peculiarity which has caused considerable confusion is the fact that inasmuch as a sprinkler system is located on the ceiling the plan should show features on the ceiling and not on the floor.

THEATERS AND CAR BARNS—Owing to the nature of construction and occupancy of theaters and car barns special rulings have been made to cover special conditions. These rulings vary somewhat with different inspection bureaus, but these rules are as near standard as possible and have been adopted by the majority:

In theaters sprinklers are located on roofs of stages, gridirons, fly galleries, painters' bridges, basements and all retiring rooms including toilets.

In lobby and auditorium sections sprinklers are omitted. Special permission should be asked for the omission of sprinklers in concealed spaces over auditoriums.

Sprinkler lines should run on top of gridirons and heads should be nippled down so that tops of deflectors will be 1½ inches below beams. Splash plates should be provided over sprinklers on gridirons to prevent the water from roof sprinklers wetting the solder on heads below, which would destroy their sensitiveness. (Splash plates are small metal collars over sprinklers.)

Under stages proper sprinkler lines should be equipped with shut-off valves and drains to near cross mains. This arrangement will permit the removal of pipes under traps with the added feature of having protection on the remaining portions.

Separate shut-off valves should be used to divide sprinklers into three units,—*I*, stage basement; *II*, all sprinklers above stage; *III*, auditorium basement including auditorium.

Sprinklers are located over a proscenium arch for the purpose of wetting the asbestos curtain and forming a water curtain between stage and auditorium. This arrangement consists of two lines of sprinklers spaced not more than 8 feet on centers, the top line being automatic and the lower line open type.

The open sprinklers are operated manually by a quickly opened valve located above the stage floor, and are installed below the automatic sprinklers. Sprinklers should be located just below an asbestos curtain when curtain is down. Gongs should be located where the noise will not cause a panic.

CAR BARNS—A standard sprinkler system should be installed in all portions of a car barn and additional "aisle line sprinklers" should be placed on both sides of tracks, in an upright position, on horizontal pipe lines parallel with tracks, and so located that water will spray directly into cars through side windows of car bodies. The sprinklers must be at such a height that their deflectors will be from 2 to 4 inches below the upper sash rails of car windows.

The aisle sprinkler line should be placed not less than 6 inches or more than 12 inches from sides of cars to be protected. An exception may be when the distance between sides of cars on adjacent tracks does not exceed 4 feet when one line of sprinklers should be placed in the center of each aisle. Lines of sprinklers should be placed to cover between sides of cars and partitions or outer walls. Distance between sprinklers on aisle lines should not exceed 8 feet. No pipe smaller than 1 inch should be used and all sprinklers on adjacent lines should be staggered.

Automatic Sprinklers as a Life Saving Proposition

A modified automatic sprinkler system is often installed in apartment houses, hospitals, schools and other public buildings for the purpose of saving lives rather than insurance saving. In such installations the sprinklers are omitted where the fire hazard is negligible.

All basements, attics, store rooms, sleeping quarters, laundries, kitchens and attachments, tops of elevators, light and ventilating shafts, hallways, exits and retiring rooms, including toilets, should be protected. The moral effect of the presence of water in stairways and exits, in case of fire, has a tendency to calm excitable persons and has been known to avert a panic.

Specifications

Owing to the varying sizes and characters of sprinkler equipments standard specifications cannot be used, but some suggestions will cover essential items necessary with the average system.

There should be a paragraph in the specifications giving the definitions of the words, "Contractors," "Engineers" and "Owner." All items, unless otherwise noted, should be furnished by contractor.

Detailed information should be supplied covering these details:

(1) Name and location of concern to which proposal is to be submitted.

(2) Name and location of property to be equipped.

(3) Name and numbers of buildings in which the systems are to be installed.

(4) Whether systems are to be wet or dry.

(5) Number and date of requirements which are issued by the inspection department.

All piping, valves, tanks, etc., should conform to these requirements. *Note:* The procedure for obtaining requirements is to submit an application to the inspection department having jurisdiction. A surveyor or inspector will examine the plans to ascertain the exposure, hazard and available water supplies and from his report the requirements will be established.

The insertion of this paragraph will shorten the specifications:

"It is understood and agreed that all material used shall be of standard quality, that plans will be submitted and work thoroughly done and system tested when completed to the satisfaction of the (name of inspection department having jurisdiction)."

An interpretation of this paragraph denotes that the sprinkler contractor will submit plans to the inspection department and obtain their approval before starting work and that all fittings, hangers, pipes, valves, etc., shall be so constructed as to conform to requirements. It also stipulates that the contract is not completed until the installed work is inspected and approval acknowledged by reduced insurance rates.

"Duplicate of plans submitted to the underwriters, shall be forwarded to the (architects, engineers or owners)."

"It is understood and agreed that the contractor will start work at (give size of pipe, location and description of starting point)."

Automatic Sprinklers—"Contractor shall install a complete (wet or dry) pipe system of automatic sprinklers in buildings (number and description of buildings). It is estimated that (total of sprinklers) will be required."

"In case more or fewer sprinklers should be necessary they shall be charged for or credited at (agreed price) per sprinkler."

All contracts should contain this pro-rata clause to cover small changes at building.

If high temperature or corro-proof sprinklers are necessary, number and locations should be specified.

Open Sprinklers—"Contractor shall install a complete system of open sprinklers consisting of (total number and size of orifice) to be installed on (give description of location), making (size) connection to (source of supply) with necessary controlling valves and draw-off piping. All pipes on system side of controlling valve, and all fittings and hangers outside of building to be galvanized."

Valves—"(Alarm or dry pipe) valve (or valves) to be installed as outlined in requirements."

"Above (valve, or valves) to be connected to electric alarm gong (specify location). This connection is to include electric alarm gong, batteries, wiring, switch and cleats; also annunciator, conduit and hood when required."

"(Number) water motor alarms to be furnished and connected in a standard manner on the outside of the building at locations satisfactory to the inspection department."

"Contractor shall install necessary gate and check valves to conform to National Board of Fire Underwriters' standard." Gate valves should be located under alarm and dry pipe valves in main sprinkler risers and in supplies to adjoining buildings; also, as in the case of department stores, special efforts should be made to reduce water damage by installing a valve on each floor. Ladders or riser steps should be provided for floor shut-off and draw-off valves and check valves installed in supply pipes. Give number and description of valves needed or direct attention to valves shown on requirements.

Drains—"All wet systems should pitch at least ¼ inch in 10 feet and dry system ½ inch in 10 feet for drainage. Main draw-off for system should be properly connected so as to permit full flowing capacity of a 2-inch pipe. Auxiliary draw-offs shall be satisfactorily connected."

HANGERS—"All inserts for hanger rods and sleeves for pipes shall be furnished, together with complete plans showing location, by the contractors and installed at building by owner."

Inserts for sprinkler piping should be of a type to provide for horizontal adjustment and of a size suitable for standard hanger rods approved by the insurance laboratories. Owing to the special design of these inserts, it is recommended that they be furnished by the contractor. Owner should arrange to set inserts on concrete forms to avoid special trips to buildings by contractor.

EXTRA SPRINKLERS—"Contractor shall leave at the building a cabinet with twelve sprinklers and sprinkler wrench to be used in case of emergency."

STAND PIPES, ROOF HYDRANTS AND HOSE CONNECTIONS—"(Number) (size) standpipes in (descriptions of location) with (number) (size) hose out lets, connected to source of supply, with controlling valves and draw-off connections."

"Hose equipment as follows: (number) (size) (number)-way roof hydrants to be installed on (description of buildings), connected to sources of supply, with controlling valves and draw-off connections."

"(Number) (size) hose connections, attached from 2½-inch or larger sprinkler pipe. Outlet for hose to be 1-inch. Should be installed (locations). Each connection shall be complete with control valve, hose, ½-inch or smaller hose nozzle and rack clamped to pipe or bracket attached to wall."

FIRE DEPARTMENT CONNECTION—"(Number) (single, two-way, three-way, four-way) fire department connection (descriptions of location, sidewalk, wall, etc.) connected to system in a standard manner complete with approved caps, check valve and automatic ball drip."

FIRE PUMPS—"(Number) (——) gallon National Standard Underwriters' Steam Fire Pump. (Number) (——) gallon (electric—rotary—triplex—centrifugal) Standard Underwriters' Fire Pump (——) volts, (direct-alternating) current, (——) cycle, (——) phase."

"(Designate) shall provide foundations with anchor bolts for (description) pumps. (Designate) to set pumps. (Designate) shall furnish (direct-alternating) electric current, including necessary switchboard, starting device, etc. (Designate) shall make wiring connections from switchboard to motor."

"(Designate) shall provide pump house, when necessary, of required dimensions."

"(Designate) shall provide steam connection, from proper size valved outlet to pump, and exhaust connection from pump to atmosphere. Contractor shall provide (size) suction pipe from (cistern—reservoir—city water supply) to pump, including (post valve—gate valve)."

"Contractor shall make proper connection from discharge of pump to (underground supply line), including necessary check and gate valves, and connection from waste cone to outside of pump room."

"Contractor shall provide connection from tank filling pump to tanks, with necessary controlling valves."

"Contractor shall furnish (number) -way hose connection at convenient point outside pump room and connect with discharge of pump, including shut-off valve, hose thread to conform to local fire department standard."

"(Number) (——) gallon (wood—steel) priming tank complete with connection to pump, set on supports provided by (——)."

"(Designate) to provide filling pipe for priming tank, including ball float valve."

"(Designate) to provide necessary priming connection to pump from city water supply."

PRESSURE TANK—"(Designate) to furnish (number) (——) gallon steel pressure tanks, placed on foundation or supports, including necessary saddles to be located on (roof-story) as required, height to allow of standard piping connections, built in accordance with requirements of underwriters having jurisdiction and municipal authorities, with necessary outlets to be located as shown (——)."

"(Designate) to provide tank house at (location) of required dimensions for enclosing pressure tank. (Designate) to supply light and heat for tank house."

GRAVITY TANK—"(Designate) to furnish (number) suitable (——) gallon (wood or steel) gravity tanks. (Designate) to furnish structure and supports of standard spread. Tank structure, etc., shall be in accordance with requirements of (insurance companies, architects, engineers, municipal authorities) to be located (give description of location—on building—separate structure away from building), as shown on (name) insurance (plan—requirement) date (——)."

"(Designate) to furnish proper foundation for (——) tank and set tank in standard manner."

"(Designate) to box exposed riser piping, shut-off and draw-off connections, including painting."

"(Designate) to provide proper piping from tank to (sprinkler system—underground system) including controlling valves, draw-off, filling and overflow connections and (altitude gauge—pneumercator)."

HEATERS—"(Designate) to furnish (steam hot water tank heater—coal fire hot water heater—gas hot water heater) placed at location indicated."

"(Designate) to furnish necessary connections from tank heater to tank and to (steam—hot water supply). (Designate) to furnish valved outlet at (location) from sufficient steam or hot water supply (and suitable house for heater). (Necessary smoke piping) for coal fire heater. (Necessary gas supply for gas hot water heater, exhaust pipe to atmosphere.)"

To prevent water in exposed elevated gravity tanks from freezing the tank heater has been designed. In detail the steam supply is connected to a brass coil located inside of heater; cold water, returning from base of tank riser, is heated by passing through shell enclosing the coil and warm water is discharged into tank by a small flow pipe. A thermometer on the return pipe indicates the temperatures of the coldest water in tank. Water accumulated through condensation is discharged through a steam trap.

The tank heater is an improvement over the steam coil in tank proposition, which fails when steam pressure is allowed to drop below the point necessary for circulation.

In case tank is heated by brass coil inside of tank:

"(Designate) to supply brass heating coil of sufficient size in gravity tank, return and supply pipes, (trap), gate and check valves. Supply outlet at (——) return outlet at (——)."

UNDERGROUND PIPE AND FITTINGS—"Contractor shall furnish and install cast iron piping as shown on (description) plan. Pipe shall be approved bell and spigot type in standard 12-foot lengths. All underground joints to be well leaded."

"Contractors to furnish and install (gate—check) valves." (Description where used) (as shown on plan) as follows: (number) (size)."

"Contractors to furnish and install post indicator valves (shown on plan) as follows: (number) (size)."

"Contractor shall furnish and install hydrants (with—without) independent hose valves (shown on plan) as follows: (number) (size) (number) (-way)."

"(Designate) to furnish necessary pits for (name of valves). Pits to be of standard dimensions."

"(Designate) to furnish (size) city water supply connection at (curb—property line), including meter if necessary."

MISCELLANEOUS—"It is understood and agreed that the (——) shall pay all freight and carting charges on material herein specified."

"It is understood and agreed that (——) are to do all carpenter and mason work necessary for this installation. Staging to be erected by (——)."

"(Designate) to do necessary trench work including excavating and back filling." Specify type of soil and whether shoring will be necessary.

"(Designate) shall paint all sprinkler pipes, fittings, etc., in (section—building) with (number) coats of (color and kind) paint. Pipe to be thoroughly cleaned below painting."

Owing to the fact that sprinkler contractors employ experienced mechanics, it is not expected that they should build valve houses, hydrant houses, provide foundation and arrange setting of pumps and tanks, erect tank structures, construct boxing for tank drop, build valve pits, do mason and carpenter work, trench work and painting. It is recommended that the owner provide for these details, as in most cases men doing this sort of work are employed at the building.

Combined Heating and Sprinkler System

A combined heating and sprinkler system is no new discovery but is a combination of old and proven practical devices of heating and sprinkler equipment. It consists of a slightly modified standard automatic sprinkler equipment, hot water for heating purposes being conducted in sprinkler piping.

The fundamental feature is the method of insulating the sprinkler from the hot water pipe. This insulator or water trap is a curved ¾-inch pipe, projecting from the hot water main and approximately 14 inches long. It is so arranged that a loop is made to form a pocket. The lower portion of the pocket is below the center line of the hot water main with the sprinkler elevated above this level. This method, slightly modified, has been used for years as a siphon cock for protection on steam gauges.

Other modifications are:—pipes for connecting the ends of the stringer or branch lines to a common return, a circulating pump, a hot water heater, a hot water supply pipe, a by-pass piping around the alarm valve, pressure relief valves and other necessary valves and fittings.

The hot water heater, which heats the water to a temperature not to exceed 212° Fahr., is connected by means of the hot water supply pipe to main sprinkler riser about 5 feet above and on system side of alarm valve. A valve is installed in the supply pipe so that hot water supply may be shut off from the sprinkler system when necessary. Risers, cross mains and branch lines remain the same as in a standard equipment.

The ends of branch lines used for heating purposes are piped together in convenient groups, and the return from these groups, which are provided with shut-off valves, run to a hot water return. The main return is either connected direct to the hot water heater or through a circulating pump. A by-pass is connected around the alarm valve and relief valves are installed in the hot water supply pipe at the heater to take care of expansion and contraction. No concealed pipings are installed and clean water only is used.

Where the sprinkler system does not furnish sufficient radiation to properly heat the building, additional pipe coils or radiators are installed. This auxiliary radiating system is independent of the sprinkler system.

When one or more sprinklers operate the reduction in the pressure above the alarm valve causes the valve to operate and the system to act as a standard sprinkler equipment. In establishments where a steam plant is installed the exhaust steam from engines, pumps, etc., is used for heating the water.

A summary of a report on combined heating and sprinkler systems for the Underwriters' Laboratories, Inc., and under the direction of the National Board of Fire Underwriters reads:

"From the conclusions drawn it will be noted that the design and construction of the combined heating and sprinkler system are suitable for the class of service for which the system is intended; that it is practical to install and maintain the system without unusual difficulty; that the system is not subject to rapid deterioration; that the parts and assembled system are capable of safely withstanding all stresses to which they are likely to be subjected under ordinary service conditions; that the system is reliable in operation; that accident hazard is remote, and that the parts can be uniformly made and uniformly assembled and installed."

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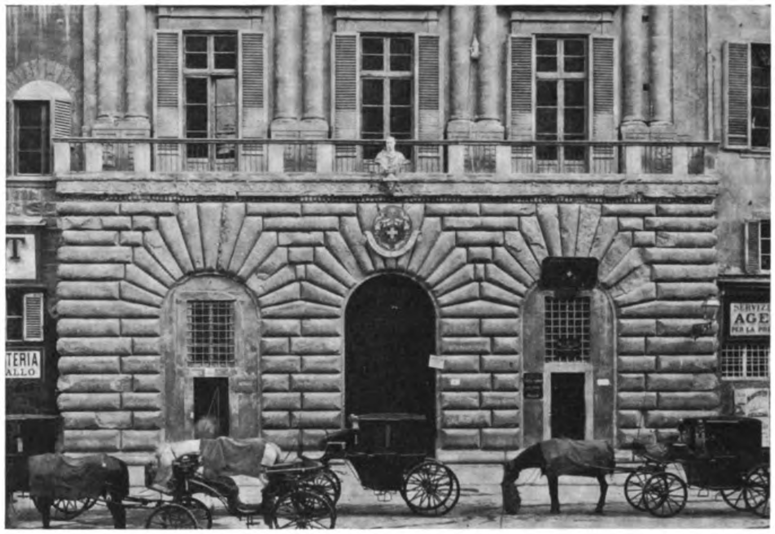
Italian Renaissance Details

A COLLECTION OF MEASURED DRAWINGS BY WM. D. FOSTER

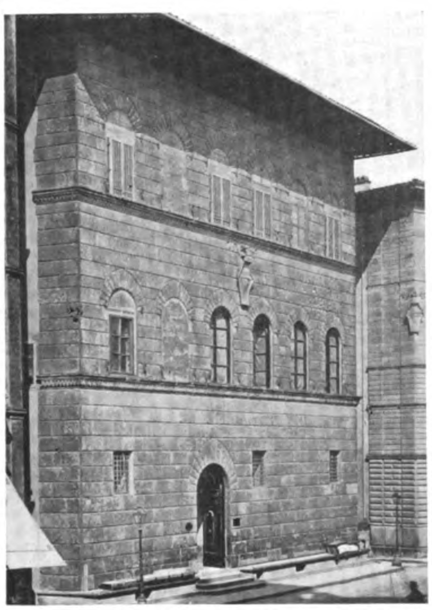


Detail of the Palazzo Uguccioni, Florence

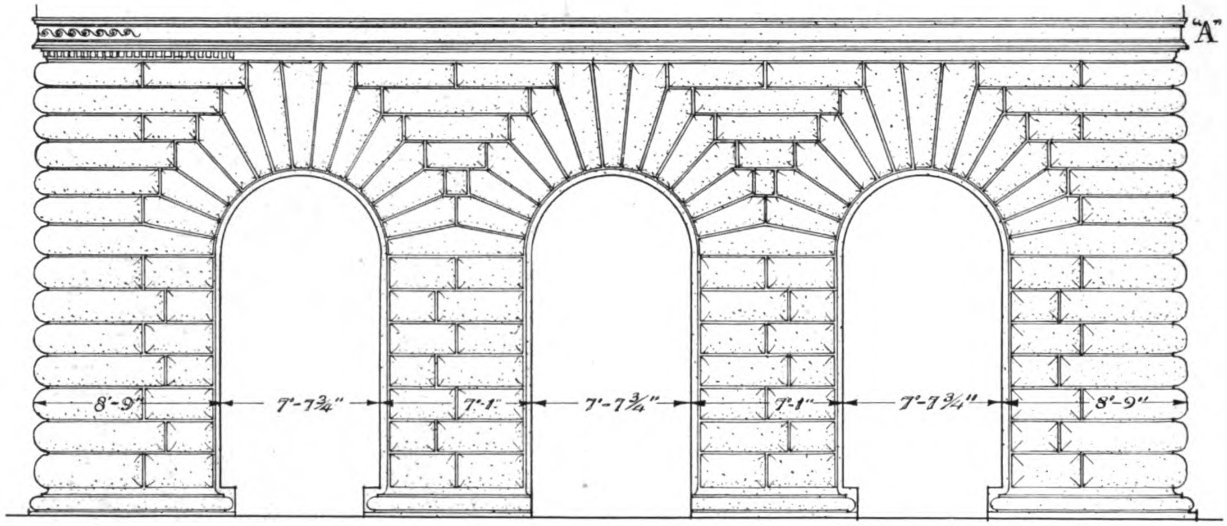
THE effect that is obtained from the rustication of a wall depends upon the study of the joints and the texture of the stone surfaces; these may result in giving a very sturdy and rugged appearance or in only slightly accenting the rusticated beyond the other portions of the building. The most interesting examples of rustication are to be found in renaissance work. Constructed at a time when there were wars not only between cities but between families and even individuals, the buildings of the time were very generally made to appear strong and capable of resisting attacks as well as actually being so. The gates of the cities as, for example, the gates of Verona by San Michele, were usually rusticated in a vigorous way that adds materially to their appearance of solidity and strength.

The three examples of rustication here shown are from the smaller palaces of Florence, of the late fifteenth century, and illustrate three variations of strengthening the appearance of the lower stories with rustication.

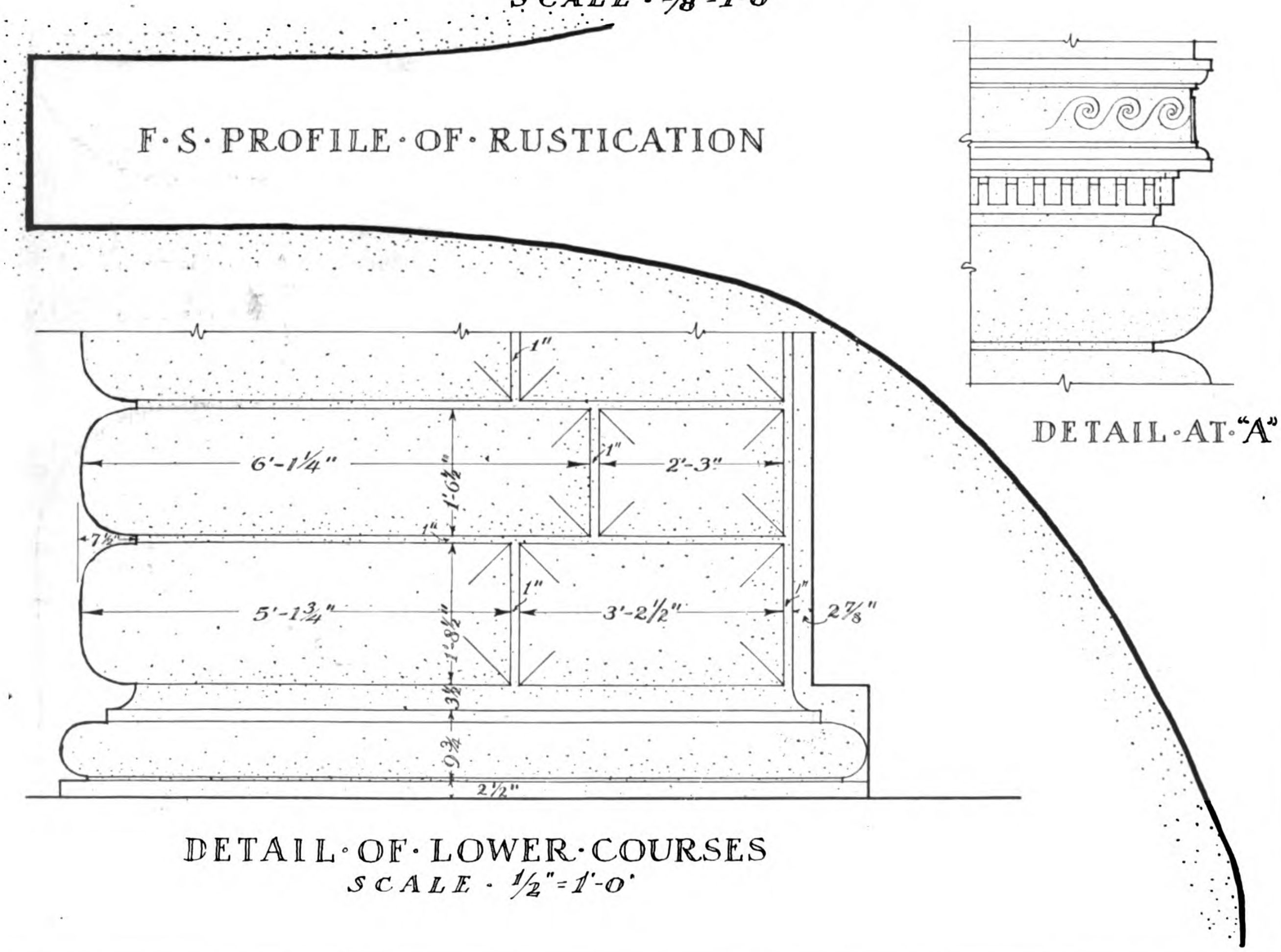
The Palazzo Uguccioni is of the particularly rugged type with very deeply recessed joints, the projection of the stones being from 7½ to 8 inches beyond the joints. The surface of the stone also is rather deeply tooled. The rustication of the Palazzo Davanzati and the Palazzo Antinori is much flatter and the surface of the stone, accordingly, is tooled more lightly. In each of these cases the stones project from the joints from 1 to 1½ inches. The rustication in the Palazzo Davanzati stops at the band course while in the Antinori instance it continues up the whole façade, being slightly lighter above the band course. The Palazzo Antinori is one of the finest of all examples of the renaissance palace both in proportion and refinement of detail. The treatment of the lower courses, where the projection forms a seat as well as a base to the building, is interesting and was used on several of the other palaces. In all three of these buildings the rustication is carried around the sides for about five feet.



Two Florentine Façades, Palazzo Antinori and Palazzo Davanzati

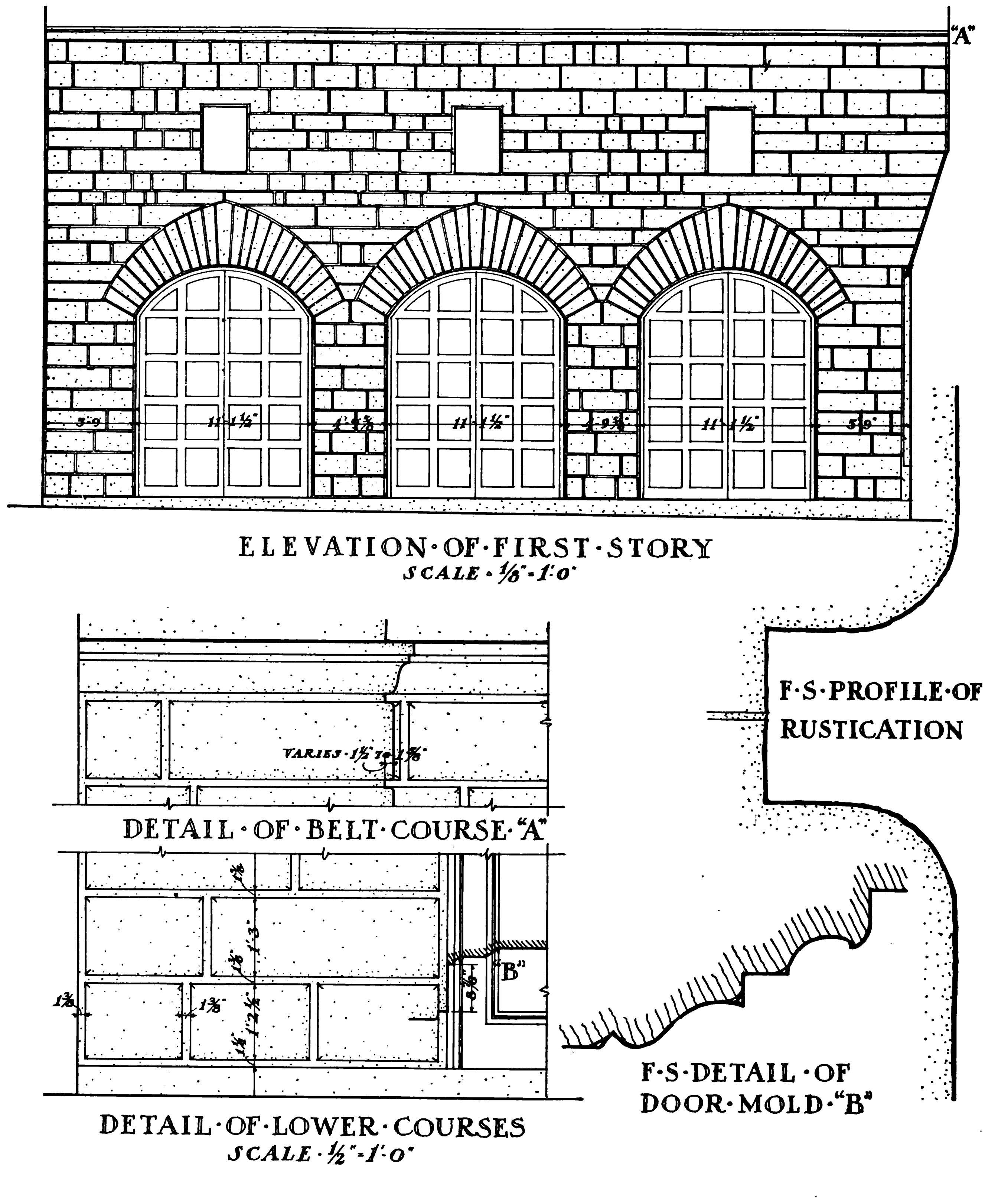


ELEVATION · OF · FIRST · STORY
SCALE · 1/8" = 1'-0"

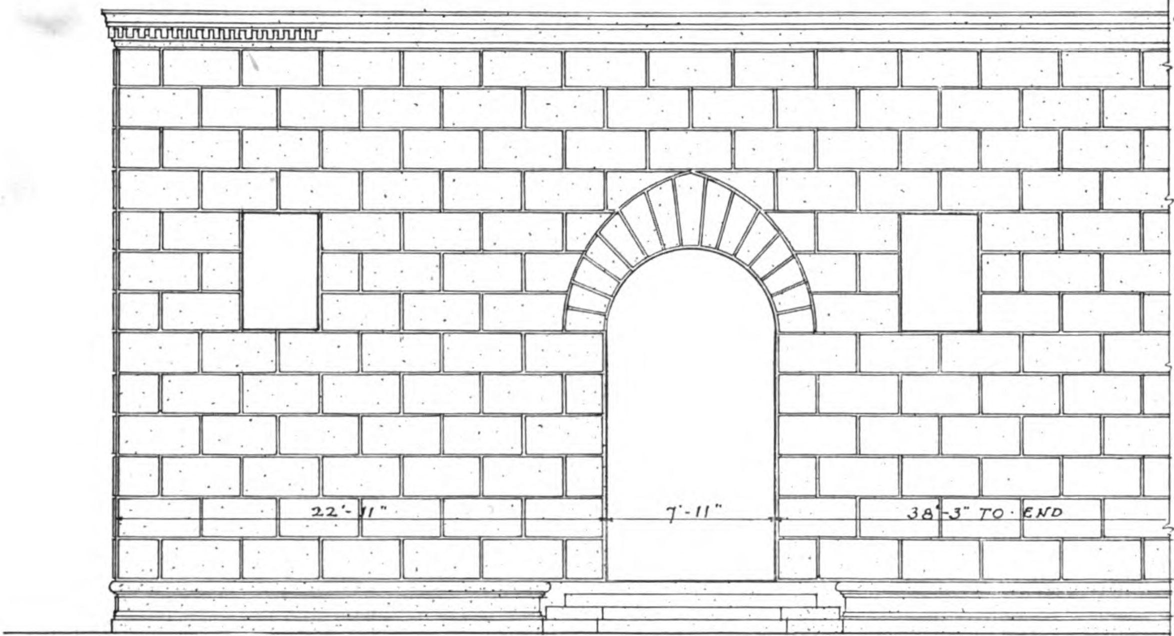


DETAIL · OF · LOWER · COURSES
SCALE · ½" = 1'-0"

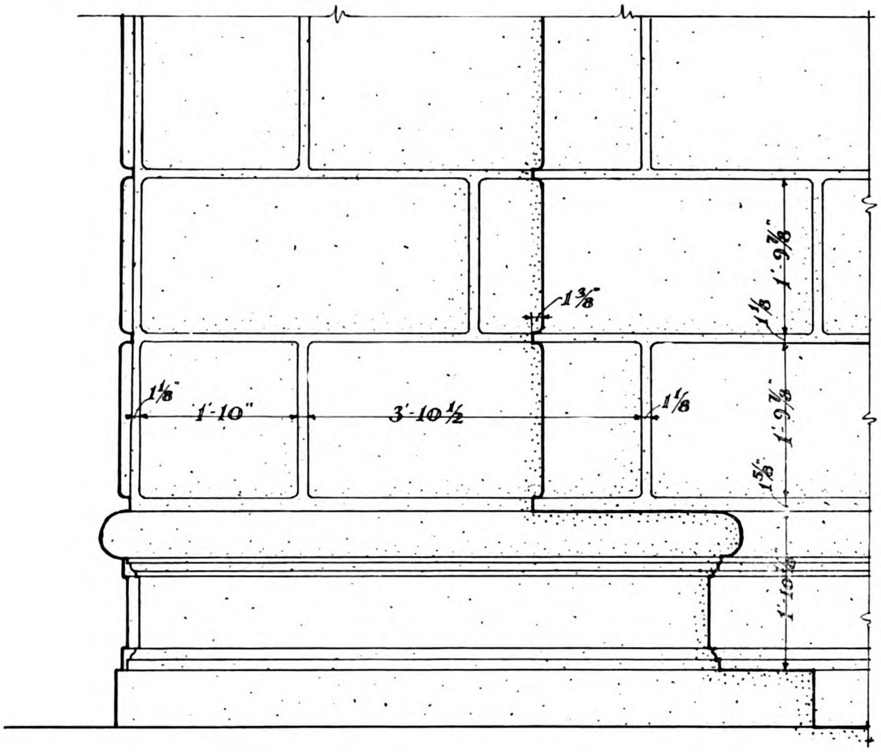
ITALIAN DETAILS 1920	*PALAZZO UGUCCIONI FLORENCE*	MEASURED *and* DRAWN · *by* WM · D · FOSTER



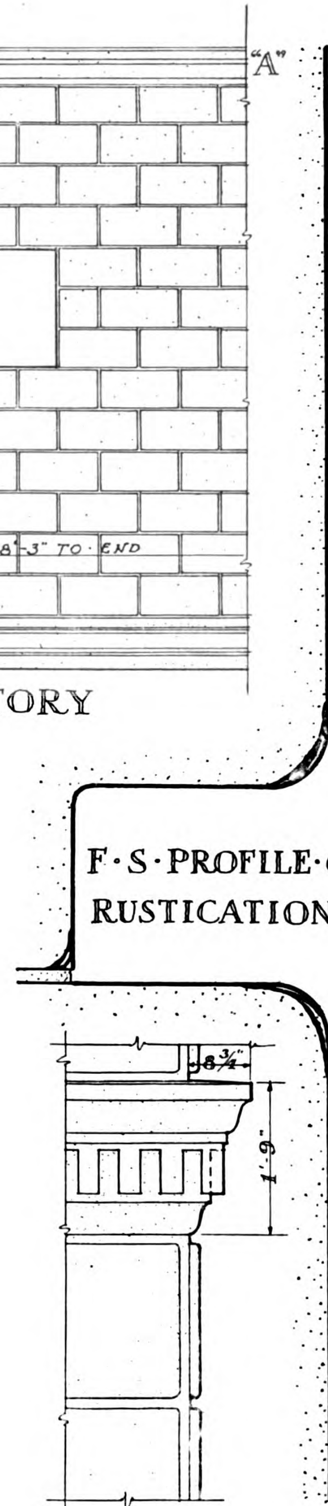
ITALIAN DETAILS 1920	*PALAZZO DAVANZATI FLORENCE*	MEASURED *and* DRAWN · *by* WM·D·FOSTER



ELEVATION · OF · FIRST · STORY
SCALE · 1/8" - 1'-0"



DETAIL · OF · LOWER · COURSES
SCALE · 1/2" - 1'-0"



DETAIL · AT "A"
1/2" = 1'-0"

ITALIAN
DETAILS
1920

PALAZZO ANTINORI
FLORENCE

MEASURED and
DRAWN · by
WM · D · FOSTER

C. STANLEY TAYLOR, *Associate Editor*

Encouraging Conditions in Building Construction Field

DURING the past month there have been a number of unusual developments in the building construction field, many of which are of an encouraging nature, directly affecting the volume of work which may be expected next year. Never in the history of the industry has building been so definitely a subject of national interest. The voicing of popular demand for relief from the present condition of building shortage is having its effect in the development of intense interest in the subject on the part of federal, state and municipal legislative bodies. Organized efforts are being made throughout the country to bring about the release of funds for building and permanent mortgages, the stabilization of material prices, betterment of transportation conditions and the establishment of more amicable and stable labor relations.

Regarding the general economic situation the National Bank of Commerce has recently issued a statement that the banking situation is improving rapidly. One section of this report is of direct interest in its application to conditions which are reflected in the building industry:

"A number of factors have facilitated the improvement in the credit outlook. As the continued improvement in transportation permits more normal movement of commodities the mobility of credits is gradually being restored. Progress is being made in the liquidation of commodity stocks and of loans against them. While the downward trend of prices involves current difficulties, it is a movement toward greater rather than less stability in both the credit and the general business situation, since it tends to reduce the pressure on banking facilities and at the same time to stimulate the large potential demand for goods which increasingly high prices had impaired. In contrast with the movement in progress a year ago, therefore, the general trend of business conditions within the United States is in the direction of increasing soundness and stability.

"Prices continue to move downward in many important groups of raw products, and of semi-manufactured materials for use in further manufactures. Declines have been passed on to the finished product in some lines. Unless untoward social and political developments should take place in Europe, however, it now seems likely that in the case of most commodities the period of rapid price adjustment has passed and that fluctuations from now on will be through a gradually narrowing margin. Present price movements, however, must be interpreted with the greatest care. Cases in point relate to those commodities the prices of which appear superficially stable, but in which, as a matter of fact, almost no business is being done. In such

INDUSTRIAL QUESTIONS	New England	Middle Atlantic	East North Central	West North Central	South Atlantic	East South Central	West South Central	Mountain	Pacific
Are building operations in your territory increasing or decreasing at this time?	Increasing	Decreasing	Decreasing	Decreasing	Increasing	Increasing	Increasing	Decreasing	Increasing
In what classes of the following buildings is the greatest activity manifest? (*a*) Warehouses and factories, (*b*) Office buildings and stores, (*c*) Low priced dwellings, (*d*) High grade dwellings and apartments	Warehouses Factories Stores	Warehouses Factories Low priced dwellings	Low priced dwellings Warehouses Factories	Low priced dwellings High grade dwellings Apartments	Warehouses Factories Low priced dwellings	Low priced dwellings Warehouses Factories	Low priced dwellings Office buildings Stores	Low priced dwellings Office buildings Stores	Low priced dwellings Warehouses Factories
What is the extent of the increase in the cost of labor over 1919?	10 to 50%	20 to 40%	10 to 40%	10 to 50%	10 to 50%	5 to 40%	20 to 50%	5 to 30%	10 to 30%
Is labor increasing in productivity per man?	No	No	Slightly	No	No	No	No	No	Yes
Is there a shortage of labor?	No	Yes	No	No	Slight	No	No	No	No
Is there evidence of unemployment?	No	Slight	No	No	No	No	No	No	No
How do the wholesalers and retailers regard the prospects for fall and winter?	Good	Uncertain	Fair to good	Good	Good	Good	Good	Fair to good	Good
Are manufacturing plants well filled with orders?	Yes,—some cancellations	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes
Is there a shortage of raw materials sufficient to curtail production?	No	No	No	No	No	No	No	No	No
Is there a shortage of coal?	Yes	Yes	Yes	Yes	Slight	Yes	Yes	No	No
Is the shortage of freight cars being substantially reduced?	Yes	Yes	Yes	Yes	Yes	Slightly	Slightly	Slightly	Yes
Are general transportation conditions improving?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Are industrial concerns carrying large amounts of customers' paper?	Yes	No	Yes	Yes	Yes	Normal	No	Normal	No
Are industrial concerns discounting their bills?	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes
What is the sentiment regarding Govt. ownership of railroads?	Opposed	Opposed	Opposed	Opposed	Opposed	Opposed	Opposed	Opposed	Opposed
What is the sentiment regarding general co-operative movements?	Opposed	Favorable	Divided	Favorable	Favorable	Favorable	Favorable	Divided	Opposed

An interesting analysis of national conditions and public sentiment recently made by the Fidelity and Deposit Company of Maryland shows facts of interest to the building industry.

Table Based on Questionnaire from Nine Hundred Sources

cases actual values cannot be known until trading operations are resumed.

"Curtailment of manufacturing and merchandising activities was inevitable while price changes were radical in character. On the other hand, slowly declining prices require that business be carried on cautiously and with careful thought to the long future, but do not preclude sane and conservative operations. Unwillingness to face the facts in the hope of a return to another period of rapidly rising prices, and failure to admit that a new working basis must be found, not only react on the individual interests involved, but on the entire business community. Fortunately the facts have been recognized by many interests, but in some lines failure to do so is handicapping business."

An important analysis of general conditions throughout the country has just been made by the Fidelity and Deposit Company of Maryland. In order to determine actual economic conditions this concern sent a questionnaire for telegraphic reply to nine hundred specially selected representatives who answered the questions after careful investigation. The section of the questionnaire and replies of most direct interest is given in tabular form here.

New York legislators have been giving consideration to a number of remedial measures in order to provide relief from the acute housing shortage. These included proposed bills establishing building and mortage loan funds financed through state and municipal sinking funds and bond issues, exemption from taxation for a period of years on all new residential structures, a special tax on funds of insurance companies, savings banks and similar institutions not invested in mortgages together with many similar measures and proposed laws curbing the profiteering activities of landlords and speculators. Unfortunately all issues providing relief by the provision of financing for new building failed to pass the special session called to meet the housing shortage. Several bills were passed, however, tending to definitely curb speculation and rent raising. One interesting bill which has become law in New York exempts from local taxation for a period of ten years all new housing construction. In view of the present tax rate in New York this means a definite saving of about 30 per cent of the cost.

The legislators have also appealed strongly for federal action as follows:

1—Institute immediately a sweeping investigation of the building materials industry to ascertain if a combination exists designed to keep up the present prohibitive prices of building materials.

2—Grant priority shipment rights to building materials, second only to the priority transportation of food and coal.

3—Place an embargo on the shipment of building materials to foreign countries.

It is interesting to note that the "sweeping investigation" referred to has been instituted and material men have been called upon to report what can be done toward lowering and stabilizing prices. In these days of sudden reversals of judgment it is very difficult to make definite statements. Knowing conditions intimately, however, we are inclined to discount entirely the theory or accusation of price-fixing control in the building material manufacturing industry. Allan E. Beals of the Dow Service Building Reports, in a recent analytical article in the New York *Times*, makes these statements with which we agree entirely:

"Groping about for an underlying cause for the housing shortage, the public mind has been filled by inference and innuendo with the belief that a great building material trust or combination exists for the sole purpose of keeping basic building material prices high without regard to production capacity or demand.

"When the government officials charged with the duty of shaping industrial policy toward the winning of the war first viewed the national scope of the building material industry, they also were inclined to believe that no industry producing more than $1,700,000,000 worth of building commodities every year could possibly be conducted without some policy-shaping head. But, after careful scrutiny into the innermost fundamentals of the industry, the various boards, commissions, departments and individuals, finding no such cohesion as had been imagined, finally had to appeal to the patriotism of the various industries as separate entities in all parts of the country to sink their inter-trade antagonisms and merge their endeavors, plant capacities, and frequently organizations, temporarily to insure adequate supplies to accomplish the national aims. Promoters of great industrial and trade combines always work along the lines of mutual interest and natural trade alliances. What more diversified field could possibly be found than in the building material and equipment manufacturing industry?

"There are some 3,000 different items that can enter into the erection and completion of a modern structure in the form of materials or equipment. Common brick manufacturing interests certainly have no industrial relationship to the manufacture of lumber. As a matter of fact, they are rival building commodities. So brick, both common and face, is a competitor for public favor, with cement as a component of concrete. Lumber interests are as widely separated from the steel manufacturing interests of the country as anything that can be imagined, and so are such items as plaster and lime and hardware and glass. Building stone is in direct competition with architectural terra cotta, and so on down through the entire building material industry."

In view of the fact that approximately $2,500,000,000 worth of proposed construction work is tied up throughout the country, the recent meeting of the National Building and Construction Congress in Chicago has set in motion machinery for a scientific survey of the industry in order to develop remedial measures with every component activity in the building field working in unified harmony.

The facts just given represent only a small part of the general interest in this subject which is being manifested in every section of the country. It is evident that the results of such intensive public interest must be felt within a short period by a renewal of definite activity in many classes of construction, particularly those designed to relieve the housing shortage which is being felt in every part of the United States, particularly in centers of industrial activity and in the larger cities.

Recently there has been in the middle West and Eastern states a considerable reduction of prices in basic building materials of several classes. It is evident, however, that this condition cannot be taken as a definite sign that building costs are to be lower. Sales made at lower prices are usually found to be the result of "dumping" which generally follows when consumers show reluctance to purchase. The great obstacle at present is the lack of financing, and once building loan money is generally released building material prices will probably stabilize at a fairly high level until production can meet the successive rushes of demand as financing is provided and projects now held in abeyance are placed under active construction.

The development of powerful public demand, as evidenced by the activities herein outlined, is certain to have its effect in increasing the volume of construction and it is a fair deduction that the offices of architects and engineers will be much busier within a short time, probably immediately after the country settles down from its interest in the presidential election.

Senator Calder Places Construction First in National Rehabilitation

DEFERRED construction has been classed by Senator William M. Calder, Chairman of the United States Senate Committee on Reconstruction, as part of the war debt of the country and as a first creditor which must be satisfied before adequate earning power for the payment of the war debt can be created.

"The cause of many of our difficulties," he said, "has been federal interference, and the cure must be not only in the removal of this interference, but in the encouragement of construction work of all kinds by the federal government in order that the health and earning power, and, therefore, the credit, of the nation may be restored.

"What can this Committee recommend to break down the barriers between the willing buyer and the willing seller? From testimony of experts and practical builders, manufacturers of materials, of bankers and engineers, it appears that the initial obstacle is transportation. Many projects have been started but cannot be completed because they cannot get transportation for the necessary materials, while the season for building, to relieve conditions during the coming year, is fast slipping by."

"As to taxation, it has been represented to this Committee that this is the basic difficulty in the construction industry, for the tendency of the times seems to have been rather toward trading in the products of the old plant than investment of money in a new and more efficient plant.

"A revision of the taxation system, which would throw the burden of taxation upon expenditures rather than upon savings, which would not discourage private initiative and would not throw capital into exempt securities, has been strongly urged.

"The attention of the civic committees throughout the United States should be strongly directed against profiteering in finance. The man who is willing to build a home should be given long-term accommodations in loans equal to those accorded the farmer under the Farm Loan Bill. Investors in property should not be harassed by bonus requirements, which are now being resorted to by money lenders, I am sorry to say, in order to evade the usury laws.

"I am pleased to say that encouraging reports have been received from places throughout the country as to the increasing efficiency of labor. This efficiency should be met with a corresponding efficiency and a non-disposition to profiteer in the production of materials.

"The price of building materials has practically doubled since the war, and while in some cases this is due to profiteering on the part of the producers, it is in many cases caused by speculation due to the uncertainties of transportation. It must be borne in mind that the increased cost of transportation has greatly affected the basic costs of building materials."

Senator Calder said that builders calculate that the average cost of materials today is $2.40, as against $1.00 prior to June, 1918.

"In granting the increase of 40 per cent to the railroads, I am glad to say that the Interstate Commerce Commission, after reviewing the building situation, has recommended to the carriers that they give consideration to the hardships imposed upon the building industry and grant relief where necessary. This Committee has already taken the initiative and made representations to the carriers as to the ultimate effect of greatly increased cost of building materials upon housing and other construction; it is argued that the prosperity of the country depends upon the prosperity of its basic industries, and that, if construction is hampered, the country cannot grow and that, therefore, in the long run, the carriers will be deprived of business which might otherwise fall to them through general prosperity.

National Certification of Architects

A SUGGESTION FOR JURISDICTION BY THE AMERICAN INSTITUTE OF ARCHITECTS

By W. W. BEACH

THE practice of architecture has ever offered peculiar attractions to the charlatan and the crook, just as have, in their own ways, the professions of law and medicine. These latter have, however, been able to hedge themselves about through the entire country with stringent laws and regulations which serve to render exceedingly uncomfortable the path of any individual who attempts to enter such practice unprepared or, later, to make use of unprofessional methods while pursuing that practice.

Not so in architecture. Less than half of our states have passed laws attempting to control the profession and none of these can be considered entirely satisfactory. Not all architects believe that practice should be licensed, but all who favor such restriction are agreed that a national law would be an improvement over separate state measures.

In discussing the subject, it would be well, perhaps, to give consideration, point by point, to those things that may be expected to be gained by the institution of any supervision over the personnel of the profession.

First, then, is the elimination of the man of insufficient preparation. Such a one can, by the offer of low fees for services, acquire clients who later, consciously or not, are forced to pay for the architect's further education and experience. Such "architects" materially lower the standard of practice and, at the same time, the public regard for those who follow it.

Next should come about the passing of the charlatan who deliberately prostitutes his calling by soliciting employment both through the offer of cheap drawings and specifications and by submitting worthless "guaranteed" preliminary estimates; then later recoups through contractors and material men, at the expense of the client. This individual, even more than the ignoramus, serves to bring odium upon us and tends to reduce our whole average reputation. Why owners will continue to employ as architects (super purchasing representatives) men whom they would not trust as ordinary purchasing agents passes comprehension; but they do.

Third, we may also expect the relegation or regulation of the self-styled "architect-and-builder" and "architect-and-engineer." The public should have some means of judging such individuals or concerns other than by their advertising matter and completed work. The latter may be the product of a capable employe who may not be available for the next commission. This is true of any architect, hence again the necessity for limiting to the capable the use of the appellation.

And fourth, we should anticipate direct benefit to the public as well as to ourselves through the improvement that would be brought about in structural economy and design. Not only do the ignorant architect and the shyster copy misapplied design and details, guess at the strength of material required, and at the shape and size of the cross-section needed to meet such requirements but, through carelessness in drafting, checking and specification writing, betray their clients' interests at every stage of procedure. This is done as often by sheer waste of material as by ill-considered saving.

Where all is guess-work, little can be correct. But, when failure or loss is disclosed, the penurious owner who sought to economize by employing cheap talent is the first to cry out against the whole tribe of architects. Who suffers most?

Fifthly, we may consider the possibility of improvement of the status of the architect in the opinion of the contractor. Much is to be gained by increasing his respect for the average of us. The lax architect produces the lax builder and, inasmuch as the burden of the success or failure of a structure rests more on the former than on the latter, the contractor cannot be blamed for taking every possible advantage and profiting accordingly. Nor is it surprising to find him frequently backing for employment that architect who has pandered to his gain, rather than one who makes his work more difficult.

Now, if these five nightmares of our profession (the ignoramus, the shyster, the hyphenated, the "jerry-building" and the misguided contractor) might be eliminated or at least modified, controlled or materially reduced, how manifestly better would the public be served and how much discomfort would be subtracted from our daily toil.

State laws have helped in this, no doubt, but to them there are certain minor objections that cause their promulgators to be more or less lukewarm in their propaganda in many states, especially in those where the ethical practitioners are outnumbered by their unprofessional confrères.

One fault is that all such laws, when put into effect, must grant recognition to all individuals then practising, regardless of their fitness, reputation or character. Thereafter it takes a generation to weed the rascals out.

Another objection is that the state machinery for the administration of such laws is liable to be unwieldy and expensive—and this cost must be borne by the profession. Further, there is ever the danger of the admixture of politics.

Again, it is difficult to establish and maintain a standard sufficiently high. For instance, if a good college of architecture happen to be located within the state, it may be hard for legislators to see why graduates of such institution should not be granted license without further experience or examination, as is the case with lawyers, doctors and dentists. It is not generally understood that the faculties of architectural schools make small pretense of preparing men for independent practice, but that custom dictates that such graduates shall supplement their technical education with years of training in the offices of competent architects.

On the other hand, it should not be made impossible for a man to prepare himself for practice without having been graduated from an accredited school, no matter how unusual such procedure. Standards should be high and comprehensive, not dogmatic.

All these factors and more have been taken into consideration in working out a scheme for the examination and certification of architects throughout the entire country in a way that should be at once both feasible and efficacious.

It is simply that such certification shall be provided by the American Institute of Architects, independent of membership in that body.

The success of such measure would depend, of course, upon the number of architects who availed themselves of the privilege. But, is it not to be assumed that, if registration and certification are made simple and convenient for those who are capable, it would become as popular as is the process of admission to the bar on the part of young lawyers?

In debating this question, it were well to consider what are the influences now operating to restrain from joining the Institute many who would be fit candidates. Why would not these same causes limit the number of applicants for the suggested certificates?

Again we have recourse to an analysis:

1. Membership in the Institute is quite altruistic in its objects—any good to be derived therefrom is primarily that accruing to the entire profession or to the public at large. It is easy for the outside architect to persuade himself that Institute affairs will be properly administered and its welfare advanced without his collaboration.

On the other hand, registration is primarily selfish in its aims, though the ultimate good to be derived must be shared by all who are deserving.

2. Institute membership involves an appreciable tax on the man with a small income, an annually recurring assessment.

Registration, under Institute control, could be handled at a small initial expense and no annual due charges. Thus, if it be provided that a man is made eligible for certification by receiving the endorsement of ten registered architects, two of whom were Institute members, a fee of five dollars would likely cover all attendant expenses of the Institute bureau in charge.

If the limited acquaintance of the candidate rendered impracticable the securing of the necessary number of sponsors and made an examination necessary, then the expense of such examination would need to be added to the fee.

But, once having declared a man eligible to practise, there would be no object in having to renew the declaration year by year nor in maintaining expensive machinery for the purpose as is now done by those states where license is in vogue. The certificate granted could remain the property of the Institute, loaned to the user and revocable at the discretion of the officers of the Institute.

3. Many architects consider that, if one of a firm is an Institute member at the expense of the firm, then is its loyalty to the profession satisfied and the reason for another membership nil.

This excuse would not operate against inexpensive registration, if it were demanded by the public. All members of a firm would be expected to have equal professional standing. Again, as to this attitude of the public: it has for a long time looked to the profession to purge itself of the undesirable, while we have put upon the public the burden of the riddance. Whose is the duty and who can perform it most readily? When the public is finally stirred to attempt the task, we are asked to foot the bill. That being the case, let us get about it in a much more effectual and economical way.

4. The public takes no cognizance of Institute membership. This is because there are many able architects who are not members of the Institute, thereby discounting the prestige of the national body. Campaigns for increased membership have been effective but not all-embracing. To go much further would be to let down the bars to an inexpedient degree. There are many practitioners fit for registration who would not make good Institute timber. With certification in vogue, it would soon be a matter of course with all who could secure it.

5. Many architects, remote from centers of large practice, do not feel enough "community of interests" with their fellows to really count it worth while to join forces with men who might deem them outsiders. To these certification would have a quite different aspect.

6. We know architects who cherish strong and conscientious resentment against certain Institute members because of unprofessional conduct (real or imagined) which worked to the disadvantage of the non-member.

The withholding of Institute support by these is on par with the excuse of those who abstain from church membership because of the hypocrisy of some of the pillars therein. There will likely be some in the Institute who are unfit as long as there are hypocrites in the churches. Objectors on this score would be among the first to endorse registration and certification.

7. And there are always those who "intend to go into the Chapter some day"—"when they get around to it" or "when a different set of fellows gets into control" or simply when they can make up their minds to expend the effort and cash.

These procrastinators will always put things off but, in lesser numbers, if the public manifests a preference for registered architects—as it surely will.

Arguments against the inauguration of the venture may be summed up as follows:

1. It would be purely experimental and the result very much in doubt. Failure would be worse than no trial.

Any departure from established precedent is experimental. The conservative who refuses to experiment with the uncertain is reactionary. Through the years of existence of architectural practice almost nothing has been accomplished by the profession at large to make easier the path of the average practitioner, except in a few states, as has been noted. It will take further generations to extend licensing throughout all the states and then another generation still to make it effective. How much more quickly and surely could Institute regulation be inaugurated!

2. It would reduce Institute membership by causing many to substitute registration.

Perhaps; but, on the other hand, it is more probable that the Institute, by the inauguration of a measure of such practical value to the entire profession, would win as converts many high class men who have hitherto refrained from joining because of a feeling that the Institute fails to accomplish things of real benefit, except to a chosen few. (There are many of these who are more familiar with Chapter limitations than with the larger activities of the Institute.)

3. It would render useless the machinery already upbuilded in some states for the accomplishment of a like purpose.

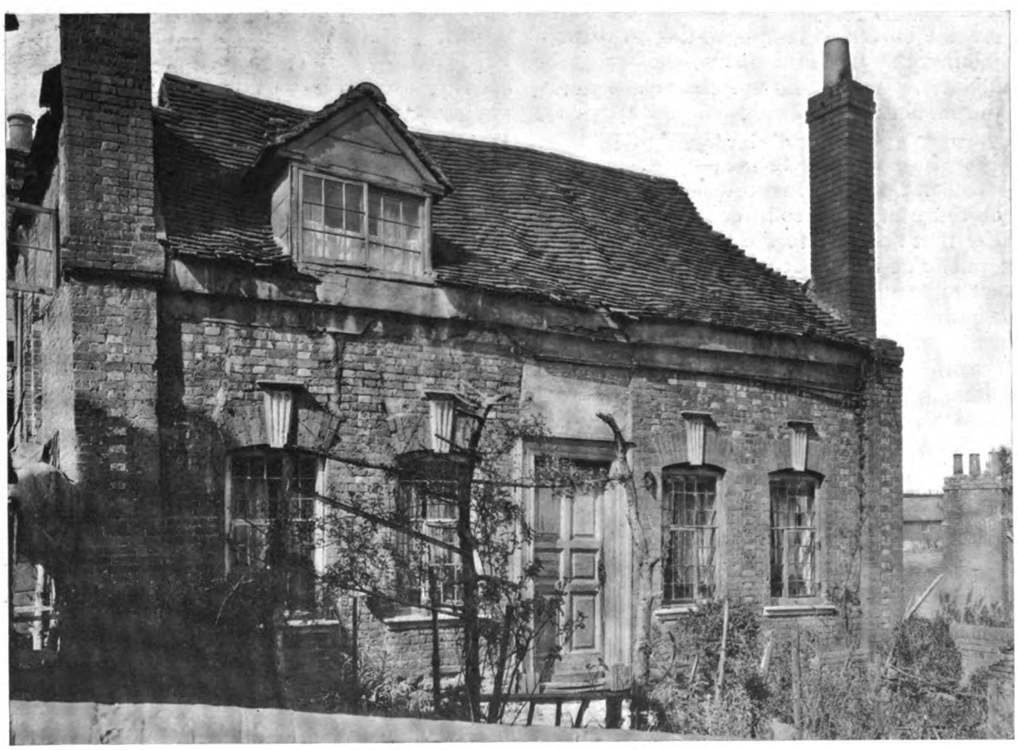
So be it. It is better that this should be wasted than that many should continue to suffer needlessly because a few are satisfied. But there is strong probability that it would also help the few by adding just that one further restriction which they now lack to protect themselves against the crook who rode in on the law when it was put into effect. If national registration were placed on a higher plane than state license, he would find himself bereft of the standing to which he now pretends.

Then there follows as matters of course the two chief reasons why registration and certification by the Institute transcends all regulation by license.

First, its adoption lies entirely within the will of members of the profession. No public propaganda is necessary to its inauguration.

Second, its administration remains with the same body, free from politics or other questionable control.

Query: Isn't the time already at hand when the American Institute of Architects may be considered sufficiently representative and influential a body to warrant its initiating just this measure for the great good of the profession at large and that public which they seek to properly serve?

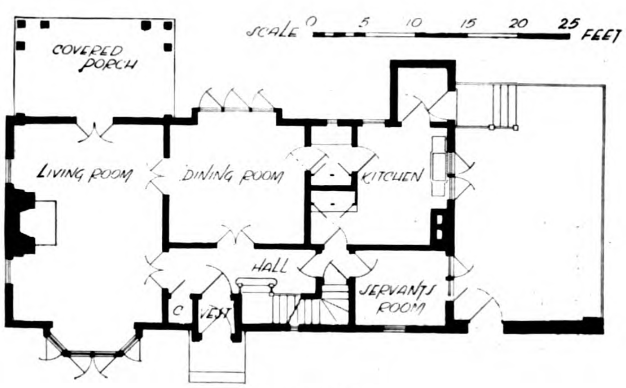


Old English Cottage of Early Georgian Character
Note the leaded casements simulating double-hung windows

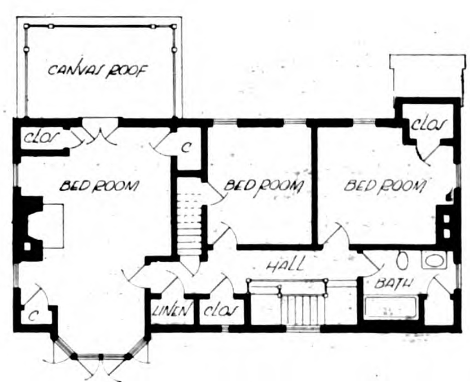
A Small Country House in Belmont, Mass.

STANLEY B. PARKER, ARCHITECT

MAIN FRONT FROM THE STREET



FIRST FLOOR PLAN



SECOND FLOOR PLAN

EDITORIAL COMMENT

THE ARCHITECT'S POLITICAL DUTY

UNDER normal conditions in the building industry, as represented by the period before the war, the interest of the average architect or builder in the question of politics was of a more or less perfunctory nature, confined principally to local issues. The coming presidential election, however, with its resultant establishment of certain fundamental policies, is of more importance to the building industry than any other single factor or condition which may be mentioned at this time.

The reason for this is simply that among the great issues of today are several of fundamental importance to the building industry. The railroad question, the shipping question, problems of international finance, the question of rural development, the coal question, and many others which may be mentioned as affecting directly the prosperity of our industry in the years to come, depend, however, upon the attitude of the government as expressed by those in executive power.

It is not our purpose to express any political preference, either Republican or Democratic, but it is our purpose to direct the attention of architects and builders throughout the country to the tremendous importance of the results of this election in its effect on conditions in the industry.

As never before it is the duty, not only of architects and builders but of every business man, to give serious consideration to the issues which are at stake and to the qualifications of party platforms and representatives. During the past few years there has been a great volume of emergency construction, but the building industry in general has suffered. Although it is one of the powerful industries of the United States (which has to play a most important rôle in national rehabilitation), it has not been accorded the attention and encouragement of which it is deserving. In fact, we can only realize the importance of the building industry when, as is the condition today, business and living conditions are seriously crippled because of the lack of proper building space.

Not only is this industry seriously affected at present by poor transportation conditions, but it is utterly lacking in the necessary financial backing which will make possible a continuation of building operations at a rate sufficient to meet normal needs, without consideration of the need for catching up with lack of production in finished buildings during the past few years.

There can be no question but that a great movement is to be expected in building construction. Already there are signs of such a movement, and the drop in material prices which has recently occurred may be construed as a lull before the real storm of building sets in.

The old law of supply and demand is beginning weakly to function again in relation to labor supply. After the election the building industry may expect unusual stimulation. To what extent this coming activity may be placed on a possible and profitable basis depends largely on financial conditions. If the results of the election are encouraging to business, and particularly to strong financial interests, there is no doubt that relief may be felt from the pressure which has recently blocked much activity in the field of building construction.

In the past, many good men have given comparatively little consideration to the issues of politics and have voted not from a sense of inner conviction or knowledge of the attitude of the party which they wish to place in power, but rather because of other motives such as environment, hearsay, or other comparatively unimportant reasons. Consequently there are many men, who have made politics a business, who design to meet their personal ends rather than to bring the greatest good to the greatest number. This year, as never before, the thinking voter must turn out to work according to his definite convictions in order that the politics of personal motives may be supplanted by the politics of an intelligently voting nation of people.

If the coming great election results in the casting of a record vote in which the average vote has received serious personal consideration, there is little question but that the outcome will be beneficial to the building construction industry. The next few years must constitute a business era of an unprecedented nature in which there shall be closer cooperation between the fundamental industries and the financial resources of this country. Politics, as a means to an end, must be discarded in favor of national business organization. The government must, as never before, be placed upon an efficient business basis in order that it may function to the best interests of the business men of the nation, and when this is done the resultant stabilization, while it may not bring a "business boom" condition, will create sound financial and production conditions which, in turn, will prove beneficial to the consumer.

Consider, therefore, not only the personalities of the candidates who are placed before the public for selection, but the business qualifications of the party platforms. The next few years will be no time for theory or academic experiments. They must be serious, practical years devoted to the rehabilitation of business conditions, backed by a strong national government which not only realizes the needs of the country's great industries, but which will recognize them and will attempt, in a serious and not too experimental a manner, to solve the problems which are before us today.

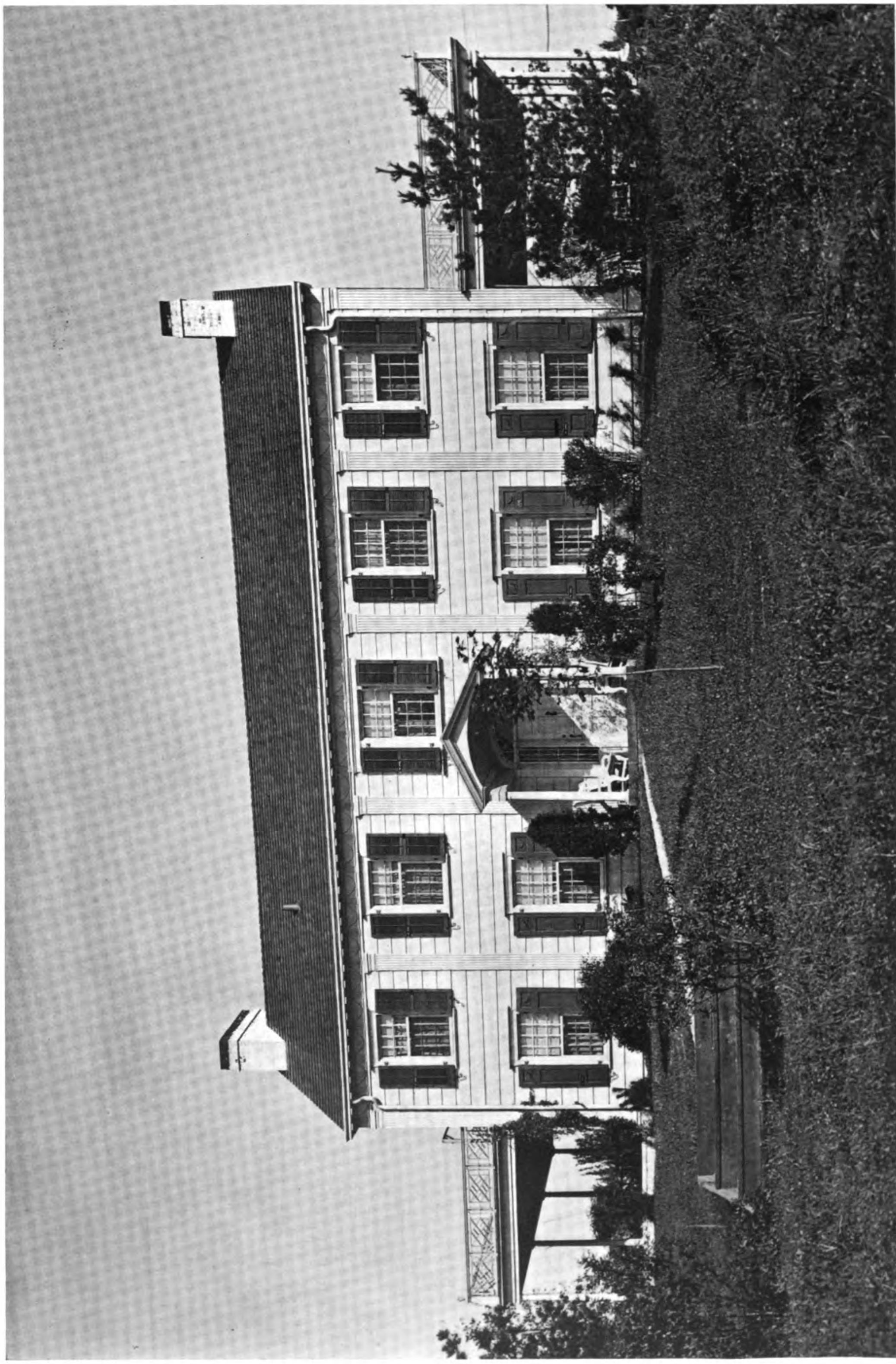
Let good men, therefore, enter into the spirit of the political situation as never before and determine, with the wise consideration which each gives to his own business, how best to create a national government which in itself constitutes a great and efficient business organization functioning in behalf of its stockholders,—the citizens and taxpayers.

LIBRARY

LIBRARY CORNICE DETAIL

HOUSE OF EUGENE MEYER, ESQ., MT. KISCO, N. Y.

CHARLES A. PLATT, ARCHITECT



ENTRANCE FRONT

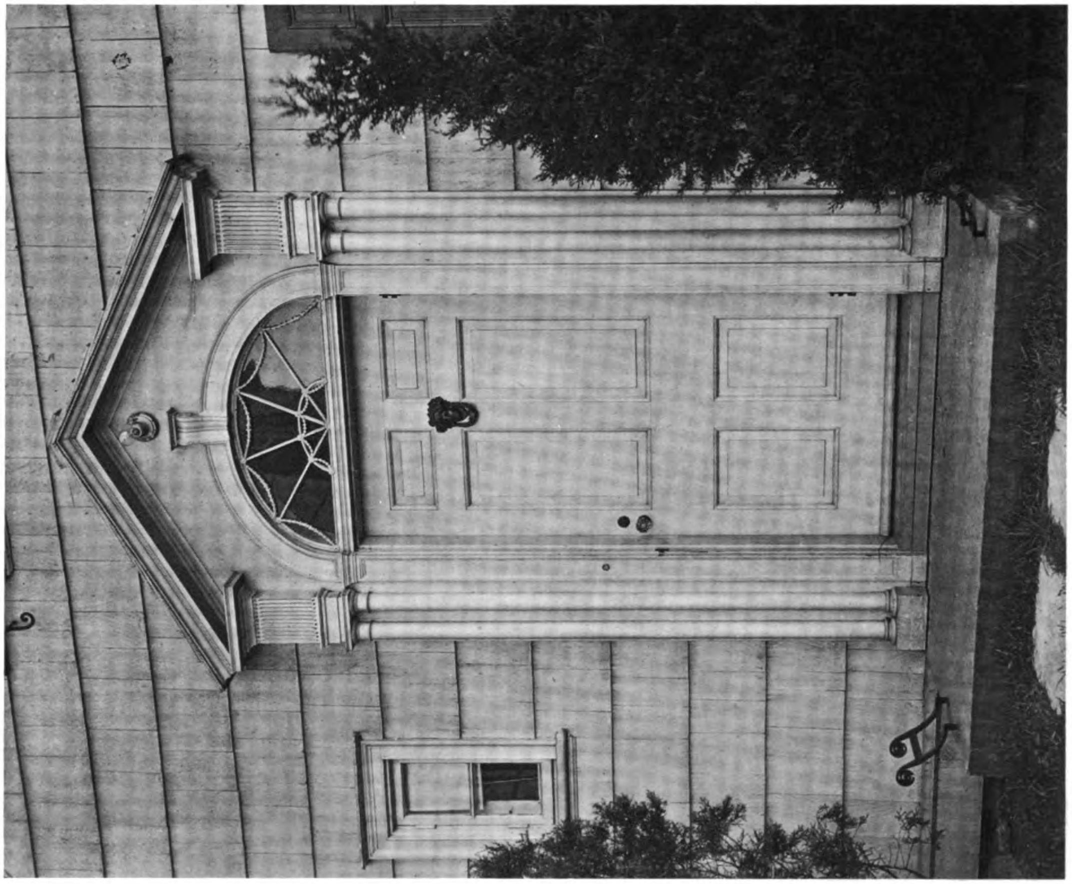
HOUSE OF SAMUEL OUTERBRIDGE, ESQ., OYSTER BAY, LONG ISLAND, N. Y.

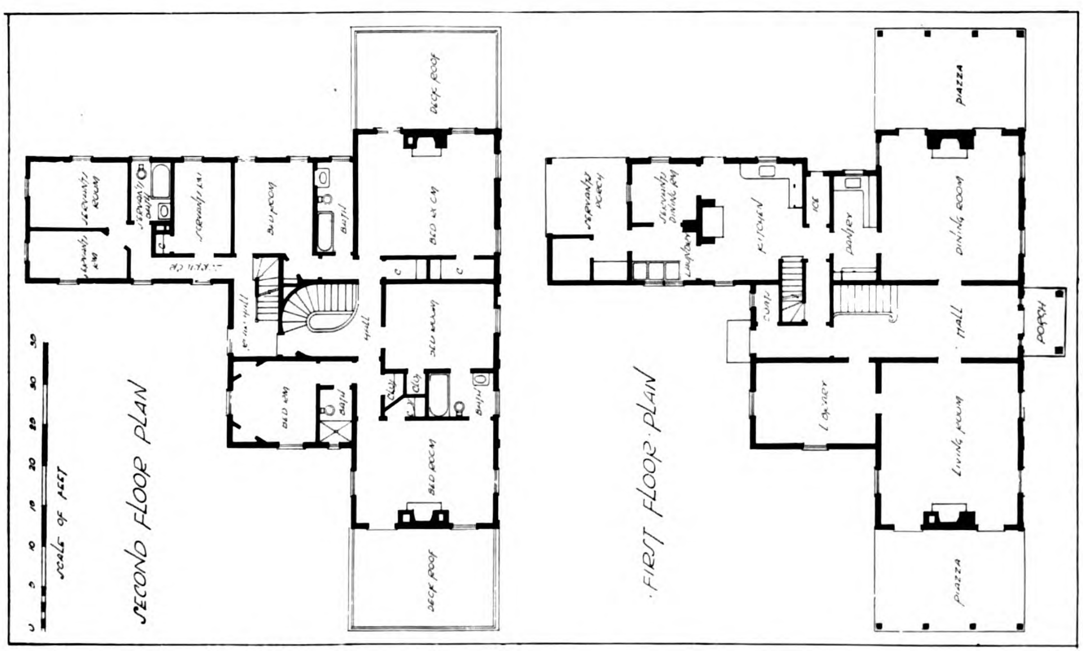
ELECTUS D. LITCHFIELD, ARCHITECT

DETAIL OF ENTRANCE PORCH

HOUSE OF SAMUEL OUTERBRIDGE, ESQ., OYSTER BAY, LONG ISLAND, N. Y.

ELECTUS D. LITCHFIELD, ARCHITECT





FLOOR PLANS AND DETAIL OF GARDEN DOORWAY

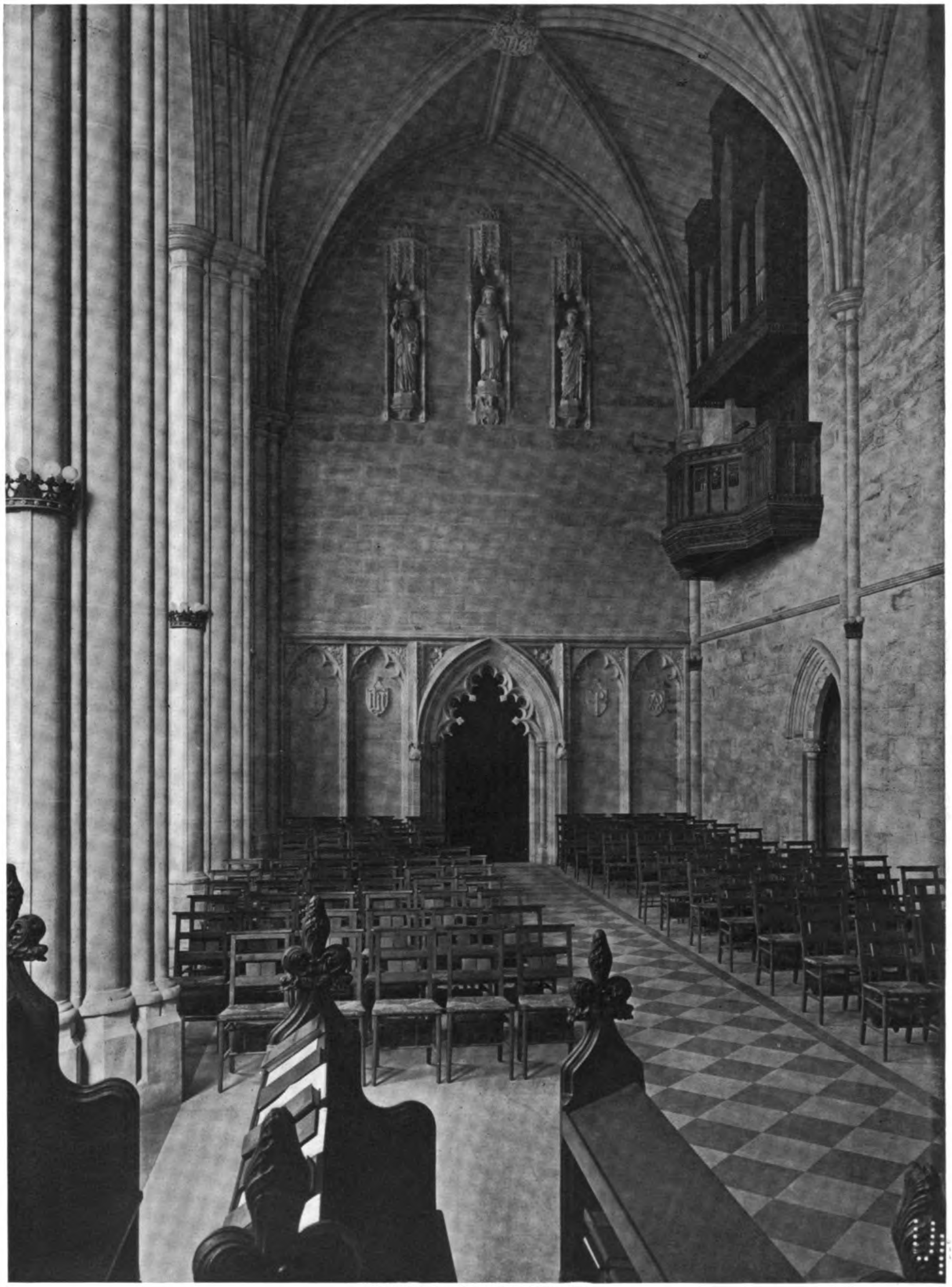
HOUSE OF SAMUEL OUTERBRIDGE, ESQ., OYSTER BAY, LONG ISLAND, N. Y.

ELECTUS D. LITCHFIELD, ARCHITECT

ALTAR AND REREDOS

ST. JAMES CHAPEL, CATHEDRAL OF ST. JOHN THE DIVINE, NEW YORK, N. Y.

HENRY VAUGHAN, ARCHITECT



WEST END AND ORGAN LOFT

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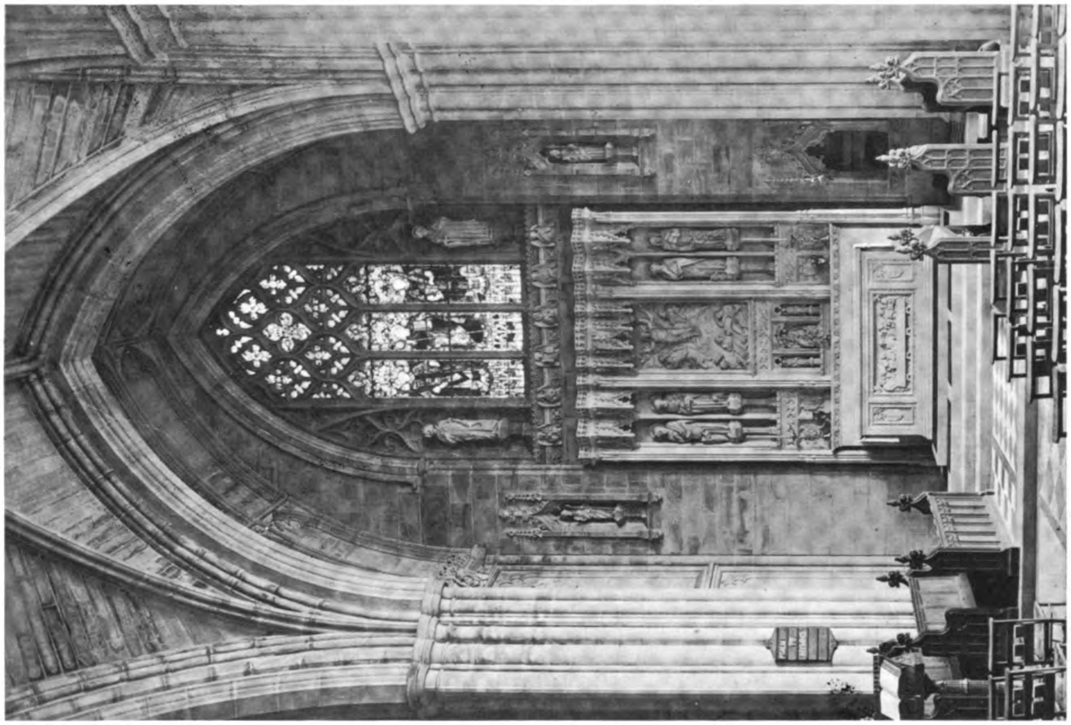
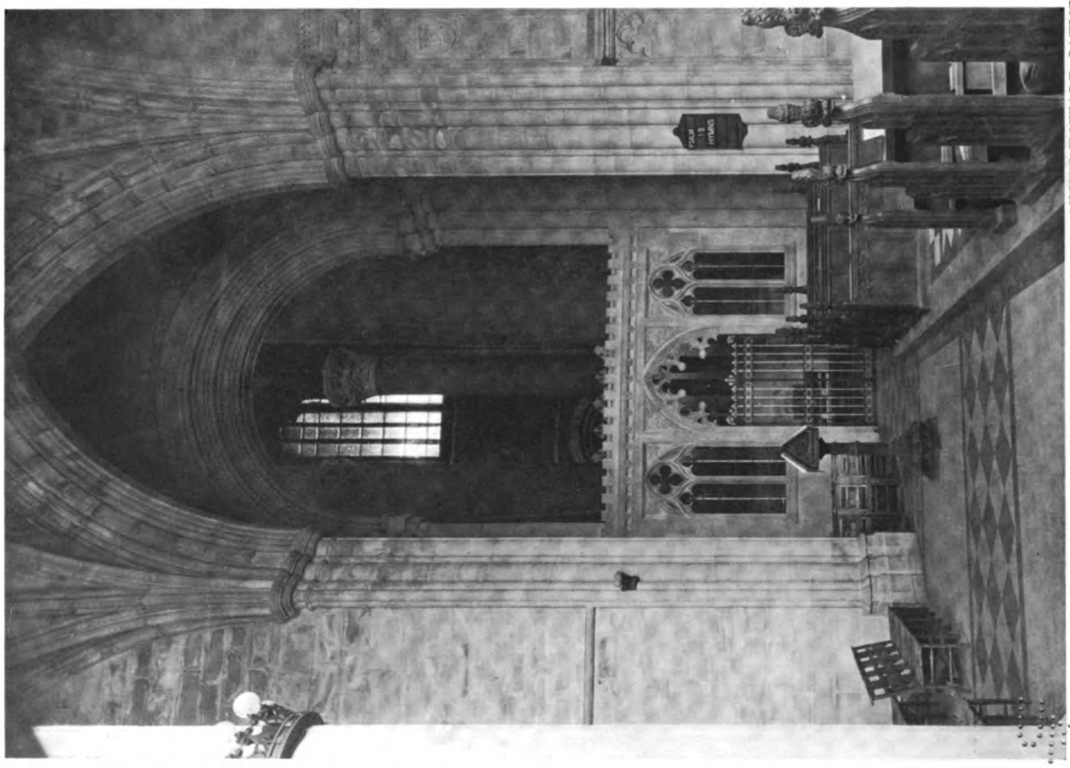
HENRY VAUGHAN, ARCHITECT

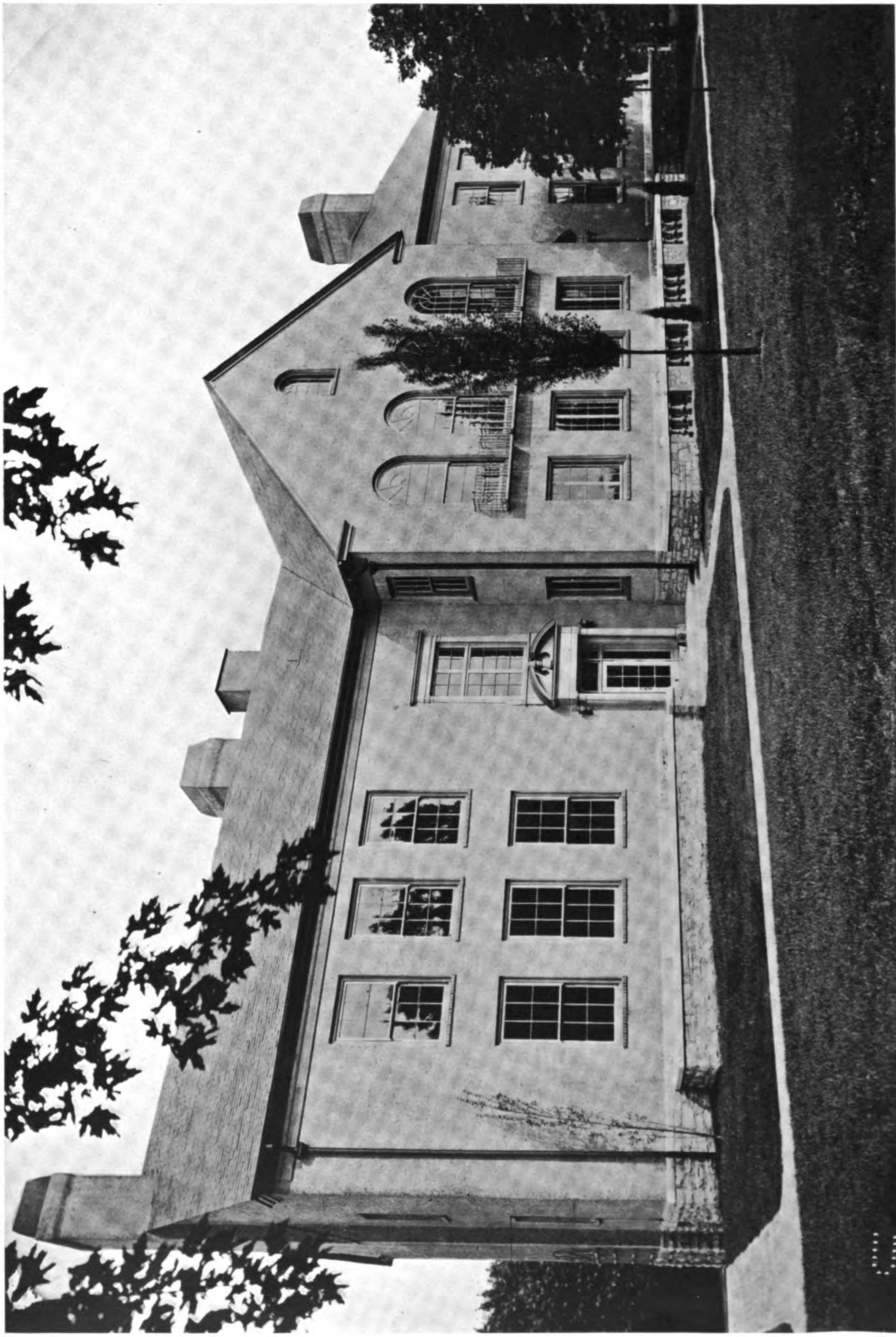




VIEWS TOWARD CATHEDRAL CHOIR AND EAST END

ST. JAMES CHAPEL, CATHEDRAL OF ST. JOHN THE DIVINE, NEW YORK, N. Y

HENRY VAUGHAN, ARCHITECT

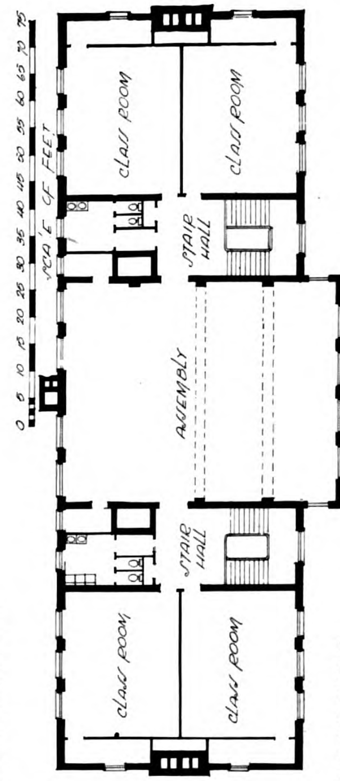


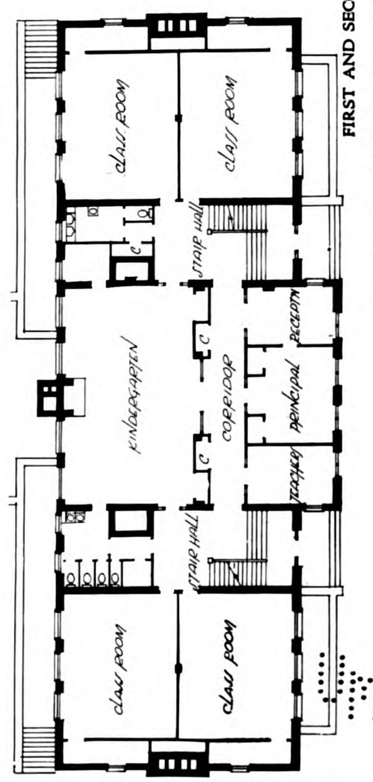
MAIN FACADE

LOWER SCHOOL BUILDING, PRINCIPIA SCHOOL, ST. LOUIS, MO.

WILLIAM B. ITTNER, ARCHITECT

KINDERGARTEN AND TYPICAL ENTRANCE

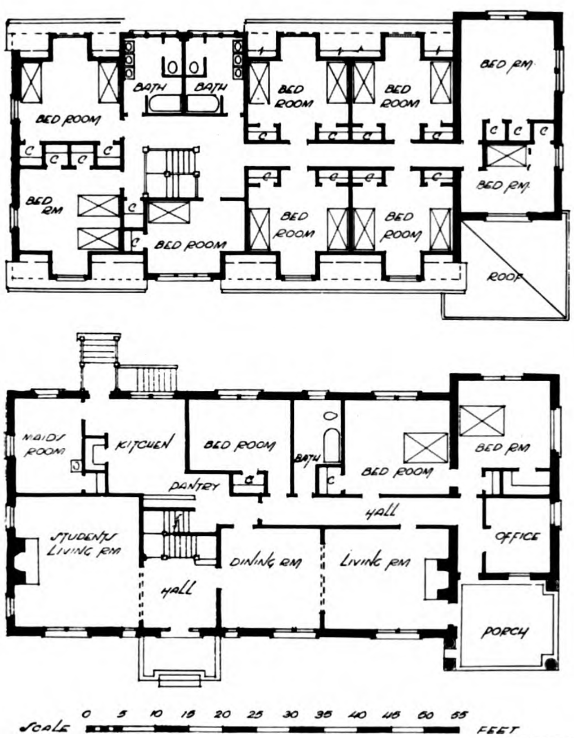




FIRST AND SECOND FLOOR PLANS

LOWER SCHOOL BUILDING, PRINCIPIA SCHOOL, ST. LOUIS, MO.

WILLIAM B. ITTNER, ARCHITECT



GENERAL VIEW

GIRLS' DORMITORY, PRINCIPIA SCHOOL, ST. LOUIS, MO.

WILLIAM B. ITTNER, ARCHITECT

GATE HOUSE AND STAIRWAYS

COMPTON HILL RESERVOIR, ST. LOUIS, MO.

GUY STUDY & BENEDICT FARRAR, ASSOCIATED ARCHITECTS

THE ARCHITECTURAL FORUM

NOVEMBER 1920

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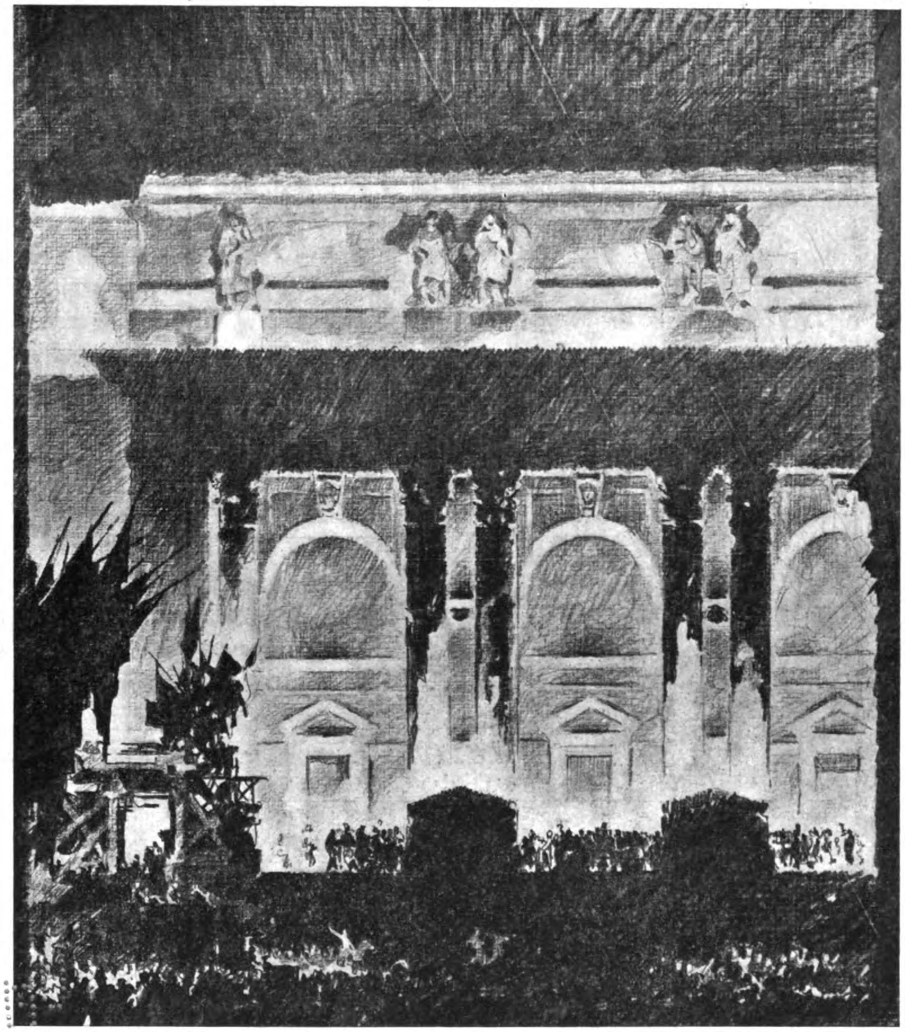

ILLUMINATION OF PUBLIC LIBRARY,
VICTORY CELEBRATION, NEW YORK CITY

From Pencil Drawing by Harold R. Shurtleff

The
ARCHITECTURAL
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VOLUME XXXIII NOVEMBER 1920 NUMBER 5

Schoolhouses in Massachusetts

By WILLIAM ROGER GREELEY
of Kilham & Hopkins, Architects

PRESENT construction costs necessitate the most careful consideration of the fundamental principles of planning. In this article there are presented facts and figures based on the experience of Messrs. Kilham & Hopkins in schoolhouse planning, in the belief that a frank discussion of costs is of value at this time. We will be glad to have similar expressions from other architects. — EDITORS.

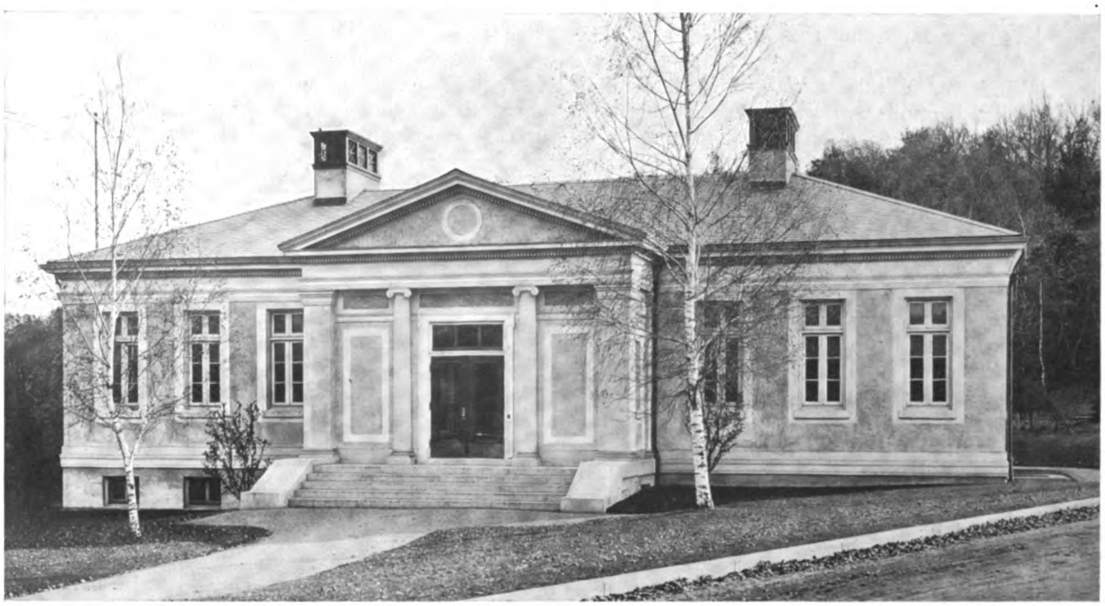
A SCHOOLHOUSE is a contrivance to protect children from the inclemency of the weather while they are being educated. They do not need to be protected from fine weather, but, from the habit of remaining in the building during the winter we drift into the belief that it is dangerous for them ever to be in the open air. They should be educated to prefer open air.

Essential Items

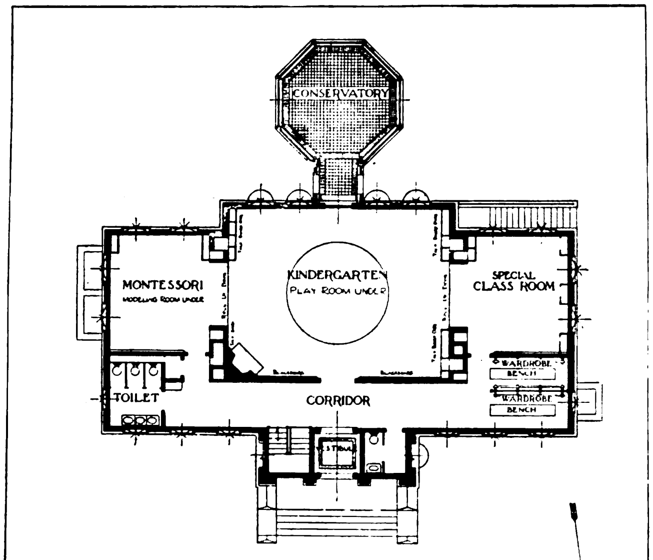
1. A roof. The principal intent of a roof is to keep out rain. Therefore a roof should not leak. Architects should bear this in mind. A roof that leaks does not serve its purpose by any means.

2. Walls. The intent of walls is to keep out rain, wind and cold. Therefore they should admit as little rain, wind and cold as possible. They also serve to hold up the floors and roof, so they should be strong.

3. Floors. The purpose of floors is to provide an area upon which to stand and sit, and place furniture. It is well to have floors smooth, even and level. As dirt is shaken off upon them, floors should be capable of easy cleansing. As they are subjected to extreme wear, they should be durable. As many feet drum upon them constantly, they



Kindergarten Building for the Town of Wellesley, Mass.
Kilham & Hopkins, Architects



FIRST FLOOR PLAN
WELLESLEY KINDERGARTEN
WELLESLEY MASSACHUSETTS

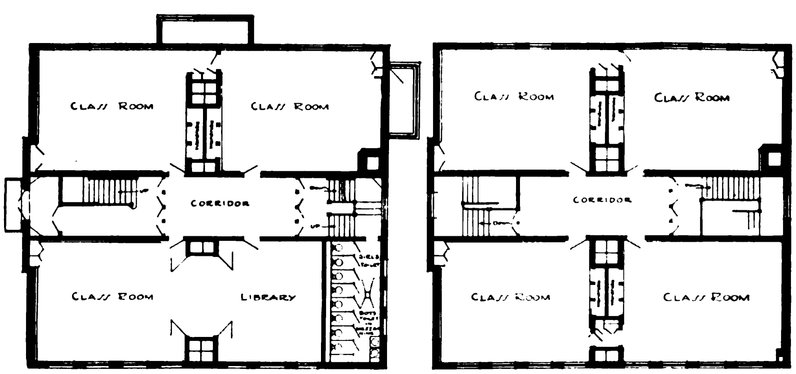
should be sound-absorbing. Only a few flooring materials can be found that will fulfil all these requirements, and the best are high priced.

4. Partitions. The intent of partitions is presumably to separate rooms, to keep out noise, and to furnish convenient areas for blackboards, maps and clothes hooks. Partitions should be sound deadening, and, as the requirements for sizes and character of rooms change from time to time, it is well to have the partitions independent of the structure, so that they can be moved or removed. This is so seldom done that it is worth mentioning.

5. Windows. Windows are provided to admit light. Where pupils are anchored to desks and made to study there for hours, windows must be carefully placed to give a moderate light that will not shine into the pupils' eyes. Windows, if they were permitted to do so, would admit fresh air to the rooms. Unhappily a belief prevails that fresh air should not come into contact with a child, until its freshness has been removed by baking on steam pipes. It may then be admitted to the presence of the pupil in small quantities through a hole in the partition. In this way the child's body is educated not to resist varying conditions of temperature, and the child learns to keep indoors all its life, and avoid all the dangers of vigorous good health. This hot-house variety of child is distinguished by pallor and lassitude. It is becoming a standardized product of the pump-fed air chambers of our public schoolhouses. In many parts of our country, windows are opened to flood the rooms at intervals with fresh air. In some states it is illegal to do so.

6. Stairs. Stairs are to enable occupants to pass on foot from one level or floor to another, and to the ground outside. In case fire or other accident should block a stair there should be another so located as to afford ready escape.

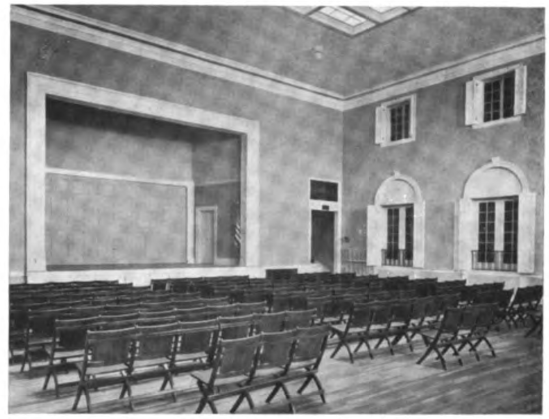
Owing to the cost of building these protective cells that we call class rooms, teachers cannot be afforded in sufficient numbers, and forty or more pupils are put in the charge of one woman. A building with ten class rooms and hall, all furnished for occupancy, costs $150,000 or more. This amount at interest would provide $9,000 a year, and the cost of running such a building would amount to $6,000 more, a total of $15,000 per annum saved if the building were not built. This would pay for ten of the very finest teachers in addition to increasing the pay of the first ten, giving a first class teacher to every twenty pupils instead of a second rate teacher to every forty. In other words, if it were not for our buildings our teaching force could be increased one hundred per cent in numbers, and improved in quality proportionately. It costs us as much to protect the children from cold, wind, and rain as it does to educate them! Every time we pay a teacher ten dollars for teaching we pay ten dollars more for protecting them from the weather! It therefore becomes a matter of importance to use every means possible to reduce the amount of structure required to house our pupils. The alternative is greater efficiency through more extended use of existing facilities but this solution is not generally popular.



First and Second Floor Plans, Riverdale School, Dedham, Mass.

Kilham & Hopkins, Architects

Kindergarten Room

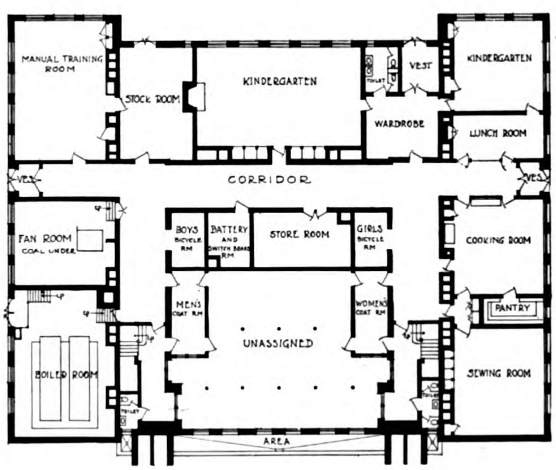


Assembly Hall

How to Figure Costs

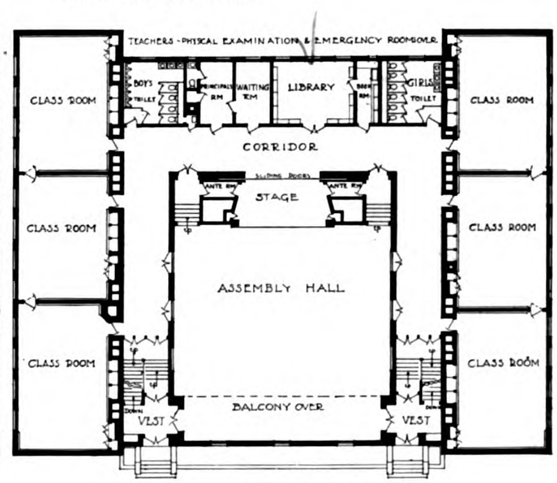
The community that is planning new school accommodations appoints a committee to report on costs, site, architect, etc. Their function is to inform themselves as to conditions and to act as advisers to the community. This committee will find in the course of its investigations many references to "cost per square foot" and "cost per cubic foot." The citizens who will vote money for the new building know little and care less about

General View of Main Front



BASEMENT PLAN

SCALE OF FEET

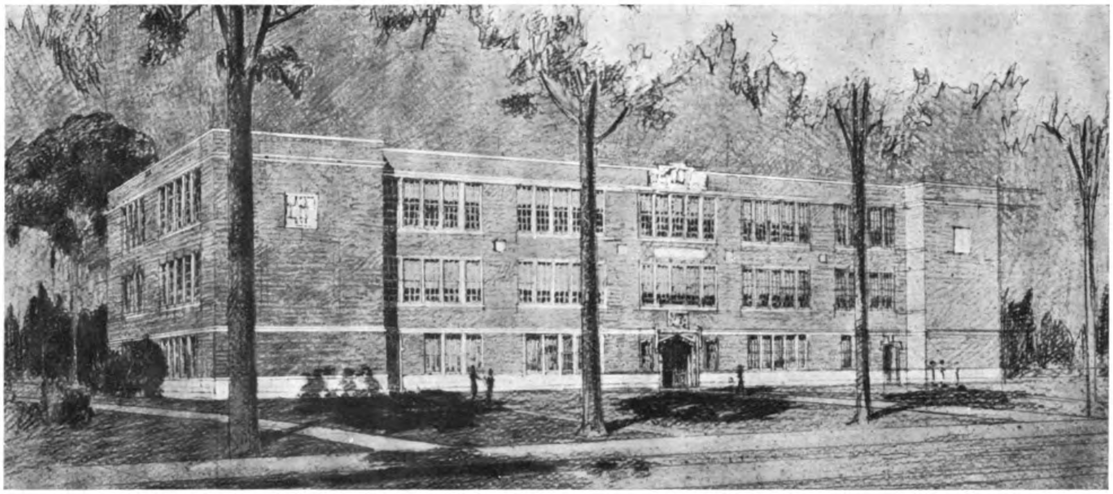


FIRST FLOOR PLAN

SCALE OF FEET

The Banks School, Waltham, Mass.

Kilham & Hopkins, Architects



Perspective Drawing of the Lincoln School, Framingham, Mass.

square or about cubic feet. What they need to know is how much it will cost to house a given number of pupils. The *cost per pupil* is the significant unit to quote to them. Schools of like accommodation can be compared on this basis. Our school buildings may be divided into a number of types for the purpose, something as follows:

1. Kindergarten (such as the Wellesley Kindergarten shown herewith).

2. Primary and intermediate school buildings with class rooms, toilets and administration rooms only (such as the Riverdale School, shown herewith).

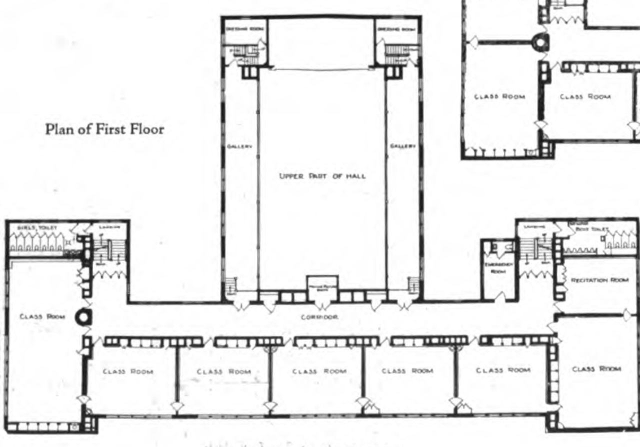
3. Primary and intermediate school buildings with class rooms, toilets, administration rooms and hall.

4. Primary and intermediate school buildings with special equipment of one kind or another, each individual (such as the Banks School, Waltham, shown herewith).

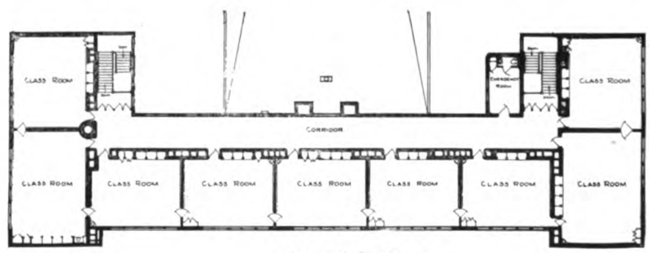
5. Junior High. Class rooms, manual training, sewing, cooking, lunch room, physical department rooms, hall and gymnasium (combined), library, study and recitation rooms and administration rooms. (The Lincoln School is of this type.)

6. High Schools. Of varying types referred to later.

The above classification furnishes a sound basis



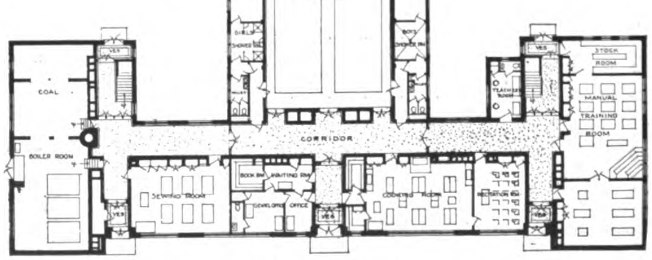
Plan of First Floor



Plan of Second Floor

The Lincoln School, Framingham, Mass.

Kilham & Hopkins
Architects



Plan of Ground Floor

for comparison of per-pupil or per-class room costs.

Since 1900 costs have at all times been on the increase. The following table shows per-pupil costs in elementary schools done in the office with which the writer is associated. It also shows cubic foot costs.

Date	Cost per Pupil	Cost per Cubic Foot
1898	$94.00	$0.08
1903	155.00	.10 -$ .12
1906	126.00	.157
1909	127.00–$165.00	.154– .174
1910	145.00– 187.00	.156– .17
1911	130.00– 135.00	.193– .194
1915	*110.00– 113.00	.179– .19
1920	260.00	.54

*Reduction in cost due to planning several schools in one "group."

The increase in the cost per pupil since 1898 has been 176% while the cost per cubic foot has increased 575%. All along the line the increase in the vital cost—the cost per pupil—has been less than in the cost of construction, *i.e.*, the cost per cubic foot of building. This relationship indicates increasingly economical and probably more scientific methods of planning.

The more expansive and the looser the design, the less will be the cost per cubic foot, and the more per pupil; while the more compact the plan, the more the cubic foot cost and the less the cost per pupil. As an illustration, the old style pitched roofs added a great deal to the cubage of the building and hence reduced the per cubic foot cost, though the cost per pupil was higher than with the flat roof type. The Chicago wardrobe system, minimum sized rooms, etc., are further illustrations. In 1903 our office designed an elementary school at 10c. per cubic foot and $115 per pupil; 12 years later another at 19c. and $113 per pupil. Here the

High School at Taunton, Mass., before Remodeling

cost of the building was almost doubled, while the cost per pupil was slightly less in the later structure. More compact and simple planning, made obligatory by the rising cost of building, alone can explain so great a discrepancy.

In the earlier grade schools of Class 2 cited above the number of cubic feet per pupil was slightly over 1,100. The 1906 school was 800. In 1911 the amount dropped below 700. In the kindergarten building (Class 1) it was 981, in the Class 3 school of 1919, 993, and in the Class 5 (junior high) now being built at Framingham, Mass., it will stand at 886 cubic feet. The low record is for a Class 2 school now under construction at 477 cubic feet per pupil. This represents an extreme in economical planning.

The high schools of the earlier years varied from 1,300 to 1,600 cubic feet per pupil. The High School of Commerce in Boston, 1914, came to 1,100 cubic feet, the Dedham High School to 1,013, in 1915, and the remodeled Taunton High School in 1917 showed a cubage of 1,010 per pupil.

The Present High School at Taunton, Mass. Kilham & Hopkins, Architects for Remodeling

These figures may be of assistance to the architect in estimating the size of a proposed school, but the variation in plan and in the individual site requirements necessitates more detailed figures before determining the amount of an appropriation. In order to determine the amount of appropriation to be required a preliminary study is necessary, and should be authorized, with a small appropriation for the employment of an architect to make this study.

The above illustrations indicate the varying relations between the cost per cubic foot, which interests the building engineer, and the cost per pupil, which is of vital importance to the school committee and the tax payer.

The statement of cost should include everything that the town has to pay, except the cost of the land. Comparisons are made of little value if this item is included, because it varies so greatly. In a large city it may be $400,000 an acre; in a small town, $400. The other factors are comparatively comparable,—(1) cost of building, (2) cost of furniture, (3) cost of architects, engineers and incidentals (say 10%), and (4) cost of necessary or ordinary grading and planting.

As an example of the cost of a carefully planned school of Class 2, the Riverdale School now under construction at Dedham, Mass., furnishes the most recent figures. The cost per pupil of building, furniture, architects' and engineers' fees and incidentals is about $285. The cost per class room is about $10,000.

Class 3 is dwindling. Schools with class rooms and a hall are today usually equipped with sewing, cooking, or manual training rooms in addition. This puts them in Class 4. A building of this class just completed in Waltham shows a cost per pupil of $283. The contract was let, however, in June, 1919. The special rooms are manual training, sewing, cooking, lunch, physical measurement, library, book-repairing, and nurse's room, separate toilets and coat room for outside public using auditorium.

Under Class 5 we are constructing a 16-room school building contracted for in November, 1919, which is costing $340 per pupil. There was a sharp rise in building costs between June and November, 1919.

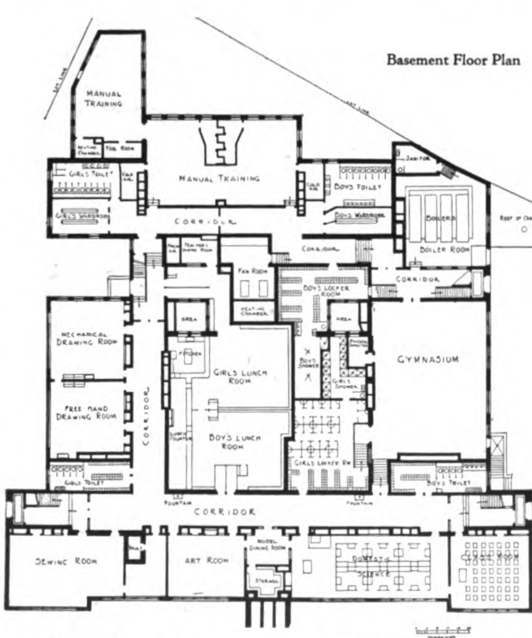
Under Class 6 there is much variation, and comparisons are likely to mislead. Some observations upon recent experience may, however, be of value.

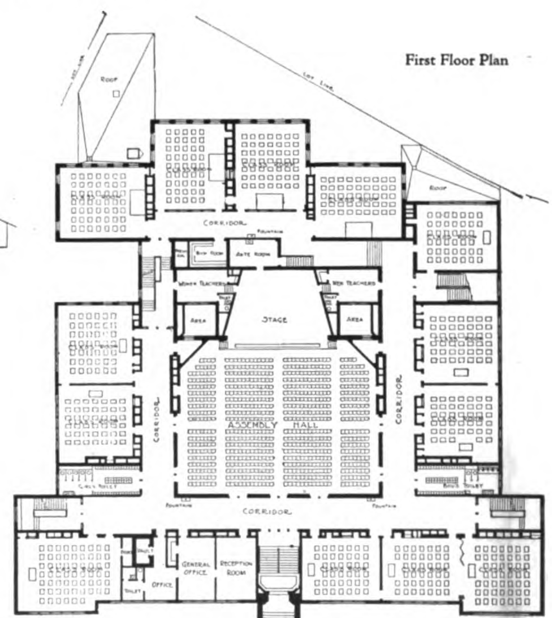
The Haverhill High School (1910) cost $.152 per cubic foot and $240 per pupil. The same building today would cost at least $750 per pupil.

The Dedham High School (1915) cost $.192 per cubic foot or $195 per pupil, and might cost today somewhere around $500 per pupil.

The Taunton High School is an interesting example of the value of altering an existing structure. Although the alterations were made in 1917–18 the cost per pupil appeared to be only about $200, an exceptional figure, resulting from the careful use of every valuable feature of the old building.

In the above analysis the consideration of beauty is not included. While there can be no possible difference of opinion in regard to the advantage of beautiful school buildings over ugly ones, it seems reasonable to say that the present conditions governing construction call for beauty of the simplest type, adapted closely to the most economical forms of construction.





High School at Taunton, Mass. The Second Floor Contains 10 Class Rooms, 3 Commercial Department Rooms and a Library
The Third Floor Has 2 Lecture Rooms, 3 Laboratories and a Class Room

Truss Design and Details

PART I. WOODEN TRUSSES

By CHARLES L. SHEDD, C. E.

WOODEN structures are the oldest form of building in use except masonry and are the simplest to construct as they may be built by the ordinary carpenter or any one handy with tools. When the beams span long distances or carry large loads it is necessary to use more complicated framing to provide sufficient strength or economy or to prevent too great deflection. To accomplish this result the use of wooden trusses was developed.

While the construction of these trusses does not require skill, the proper design where long spans or large loads are encountered does require much more skill than the design of ordinary steel columns

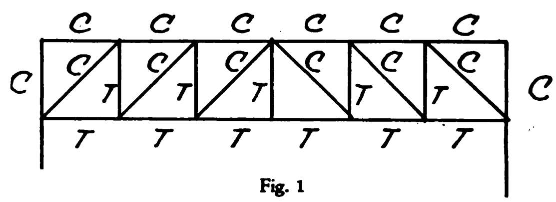


Fig. 1

and beams or even trusses. The builder often does not realize this; the result is defective design and consequent failure. The most difficult part of the design is the joints. These often fail or become loosened due to the seasoning of the timber. While the effect of this seasoning cannot entirely be overcome it can be guarded against in such a way that the effect is reduced to a minimum. Failures of this nature were especially common during the past winter when an unusual amount of snow accumulated on the roofs of buildings. This illustrates the attitude of the conservative engineer toward design. He does not design a structure which will "probably" or "usually" stand up, but one which will certainly stand up in the worst known conditions.

While this article is not intended to give a technical analysis of the design of trusses it is intended to give the architect such information as is necessary for him to have in order to outline his building intelligently before calling on the engineer to make the finished truss design, and to emphasize the importance of certain principles which the engineer should use to give the architect and his client a structure such as he is entitled to expect.

The first thing that the architect has to consider is providing space for a truss in the depth required and the arrangement of the members.

In trusses with parallel chords the depth should not be less than one-tenth of the span. To provide for good details this depth should frequently be somewhat greater, the limitations being best determined by the engineer making a preliminary trial design. By depth is here meant the effective depth which is the vertical distance between the centers of the chords. For example, a span of forty feet would require an effective depth of four feet and if the chords when designed came out twelve inches deep the distance out to out of chords would be five feet, and after allowing space for bearing plates, nuts and for a little excessive length to the rods, the distance over all for the truss would be about five feet six inches as a minimum. However, for the best details, especially if the loads are heavy, it would be desirable to make the over-all depth a foot or even two feet more.

The arrangement of the members should be such as to form a series of triangles; that is, it should be possible to draw the center lines of the members by first drawing a simple triangle and then constructing a second by two lines drawn from points of the first intersecting at a new point and so on until the full skeleton of the truss is completed. (See Fig. 1.) A truss so designed is said to be "statically determined." This means that the stresses in the members may be determined by the principles of statics.

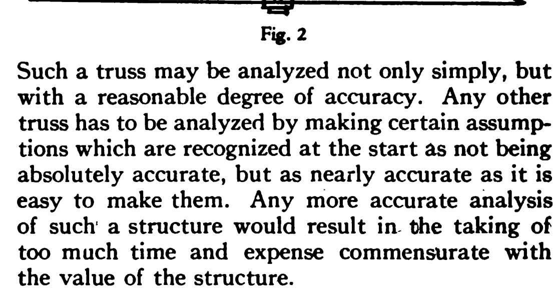


Fig. 2

Such a truss may be analyzed not only simply, but with a reasonable degree of accuracy. Any other truss has to be analyzed by making certain assumptions which are recognized at the start as not being absolutely accurate, but as nearly accurate as it is easy to make them. Any more accurate analysis of such a structure would result in the taking of too much time and expense commensurate with the value of the structure.

These stress lines should usually intersect at points along the chords of the truss. If they do not, bending is introduced into the chords and complicated stresses in the joints themselves. It is much more common in wooden trusses than it is in steel trusses to find this rule not exactly followed. Usually the cause of departure from the rule is economy in the design of the joints. (See Fig. 2.) Center lines A, B and C intersect at a point in the ideal way, but center line D does not intersect at the same point. This is done to make the casting smaller and the member is chosen which has the least stress in it to accomplish the result. In a heavy Howe truss, if this rule were strictly adhered to, the castings would be quite large; therefore, these intersections

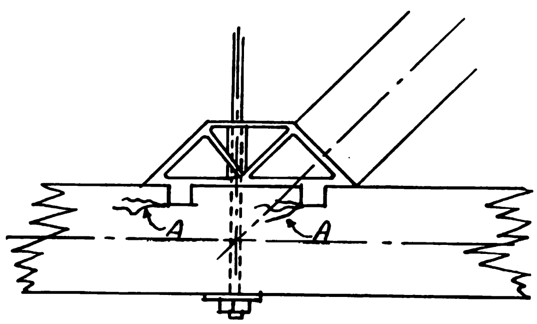


Fig. 3

are not exact but vary by a few inches especially in the case of counters and near the center of the truss. With proper care the resultant eccentricity does not amount to a serious thing because the chords are usually quite stiff in proportion to the web members.

In so-called wooden trusses the principal material obviously is wood, but to complete the details and take tension, other materials are used including steel, wrought iron and cast iron.

Spruce is only used for the lighter trusses and even in such cases is not as common now as a few years ago when the difference in cost between it and yellow pine was greater. For a number of years yellow pine of the same strength as spruce has been more economical.

Yellow pine is usually the best material from all points of view to use for the compression members and bottom chord of a wooden truss. It is more easily and accurately worked than fir, therefore the joints can be made tighter with less liability to injure the stick.

Recently, and especially during the war, fir was substituted for yellow pine as it was more readily obtained, especially in the larger pieces. It has, however, not proved very satisfactory and should be avoided where any amount of notching or framing is to be done. The grain is coarser and more irregular so that when notches are made for the lugs of castings and so forth, it is quite likely that shearing will occur directly along the grain, even before the truss is completed. (See Fig. 3.) In one case which the author noticed, over one-third of such notches had sheared in a series of trusses, and as it happened the shear had usually occurred just where it would be due to the stresses when the truss was loaded and in use. It is obvious that such defects would seriously impair the strength of the truss.

Oak is used in some cases in building on account of the finish which is desired and frequently in lighter trusses it can be used in small blocks at the joints in place of cast iron. (See Fig. 4.) It is also used in small blocks between members composing a chord of a truss to act as separators where the whole chord, if composed of one stick, would be of too great a size or where, due to the vertical rods, greater economy can be obtained by the use of several sticks of smaller size.

Oak is a very satisfactory wood to use when it can be obtained at a reasonable price. It can be accurately worked and its durability is greater than most kinds of wood. It is stronger so that less material is necessary than with other varieties.

Steel is used for the web members in tension and sometimes to reinforce the bottom chord when the stresses are too great in it to be taken conveniently by the wood. When a wooden stick is used in the bottom chord to take the tension it has to be made sometimes twice as large as would be used if it were not for the notches cut in it for the details at the joints. The bearing plates for the tension rods are made either of steel or wrought iron.

Wrought iron members are often used when the stresses to be taken care of are not too great, because they are often cheaper and can be more readily obtained. They must be larger, however, than steel members of equal strength. Another advantage of wrought iron over steel is that when it is subjected to moisture and attendant rust it does not depreciate nearly as rapidly. It can often be used for bearing plates in place of steel and here too it has to be thicker to do the same work.

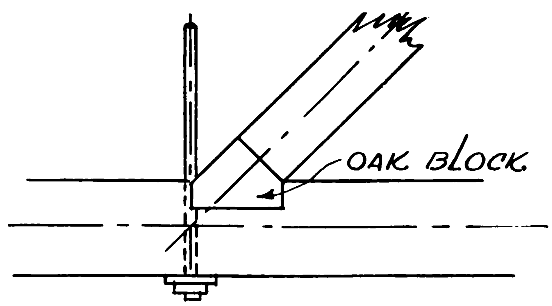


Fig. 4

Cast iron is used at the joints to complete details where ordinary notching or framing would be wasteful. In such cases these castings are of considerable size and are made of ribs with hollow places between them to reduce the cost and make them easier to handle.

Lastly, at the joints, nails, spikes or bolts are used to hold the members in place especially after seasoning of the wood takes place. These nails and spikes are very seldom actually figured to take any stress but the bolts are often designed to transmit some definite stress at the joints.

Tile and Its Installation

PART II

By E. STANLEY WIRES

TILES are appropriate for all uses where a material is required that is artistic, easily cleaned, durable, economical, fire proof and of great sanitary value. Tile is entirely inorganic and is therefore odorless and not subject to decay. A factor that lends additional desirability to the lighter shades of tile from a sanitary view, is their light-reflecting property. Bacteria and spores are killed by reflected light as well as by direct sunlight. The matter of light reflection is of interest in connection with the hospital operating room, where the intensity of illumination can be regulated and the "glare" overcome by the use of various colored tile. Since light reflected from the floor and below a six-foot wall line can shine into the operator's eyes, experiments have been made with floor and wainscots in color, retaining the lighter shades of tile above. Results show that colors from the middle of the spectrum are best adapted to the requirements. Colors from the red end of the spectrum are not advisable since they entail pronounced chemical changes in the retina, producing over stimulation and fatigue. Green and gray have proved satisfactory. Green was selected because it is a complementary color to the red of blood and the eye looking back to the wound can carry none of the green impression from the floor or wall. A further reason for the selection of colors from the less luminous end of the spectrum is that these colors permit pupilary dilation, so that the eye looking up from the red wound and seeing the green would have a large pupil when it looked back. If on the other hand the eye looked at white the pupil would contract. The following table of absorption should be of interest:

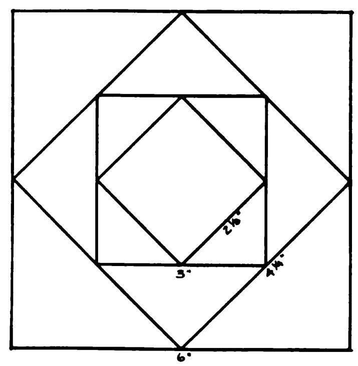
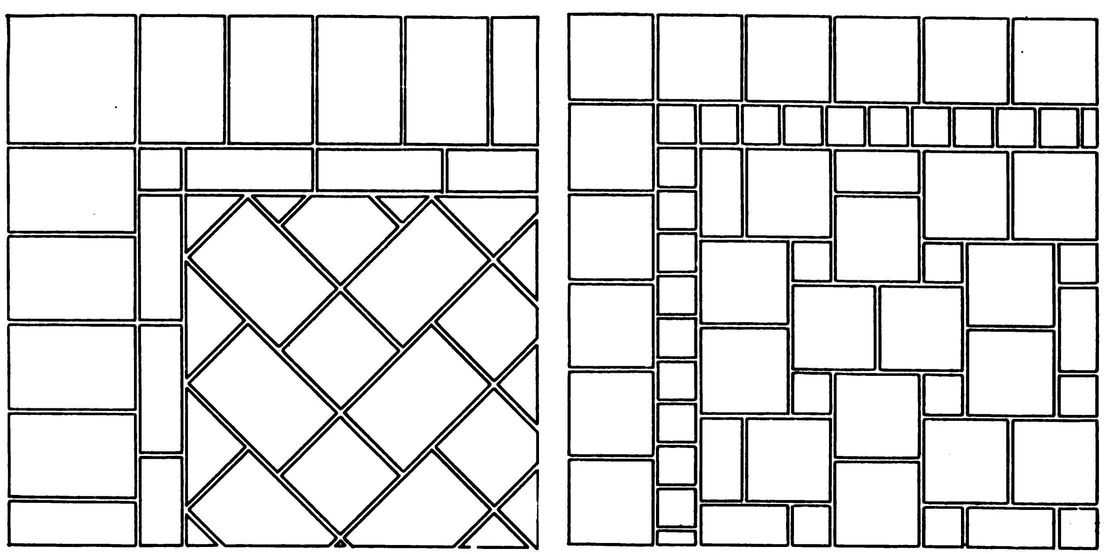


Diagram of Standard Units that Size with Each Other for Diagonal Halves

RELATIVE ABSORPTION OF COLORS

White,	18 per cent
Orange,	50 " "
Yellow,	60 " "
Pink,	64 " "
Emerald Green,	82 " "
Dark Brown,	87 " "
Vermilion	88 " "
Cobalt Blue,	88 " "
Deep Chocolate,	96 " "

These characteristics associated with tile are called for not only in the home, but in industrial buildings, where success is measured by the good health of the wage earner; in community and housing groups where hygienic results are highly important; in association and hospital buildings, and many public buildings where artistic treatment and warmth of color are desired. Unfortunately there are very few catalogues that show good sug-



Designs for Simple Tile Floor and Border in Standard Sizes gestions for the use of tile, and those that do, give only very limited ideas. Neither descriptions nor illustrations can give any idea of texture and color. A well organized firm is not dependent upon the product of any one factory, but can design in a combination of several kinds of tile, and can best lay out the detail of the work subject to the architect's criticism. One of the first requisites for a tile designer to understand is the underlying principle of tile sizes. The sizes made by the "Associated Tile Manufacturers" size with each other as shown in the accompanying diagram.

The designer must also know that very few full glazed tiles are suitable for floor work, excepting where the wear is not extreme. As a rule the soft colored tile, especially the browns and dull reds, laid in simple patterns are the most attractive. In using color, care should be taken to avoid strong contrasts, and designs that are restless or uneasy. In small scaled floors more latitude can be used in the use of color, but the desired effect is very easily overdone. Tile combined with brick or stucco for exterior insert work has many possibilities and should be used more for this purpose.

Jointing of white glazed tile is a matter of good workmanship and superintendence, rather than a matter of carefully worked out design on paper. Too tight a joint is not recommended for any kind of tile work, and the more irregular the material the wider the joint should be. For tile with rounded edges the joint should be recessed to allow for the full face value of the tile.

In "sectile" work the joint is used as part of the design. The tile fit together very much like a picture puzzle, the important outlines being true joints and the other lines counter sunk to be grouted in the same manner as the regular joints. This method of installation opens a field for the execution of the very best "mural" decoration in a permanent material.

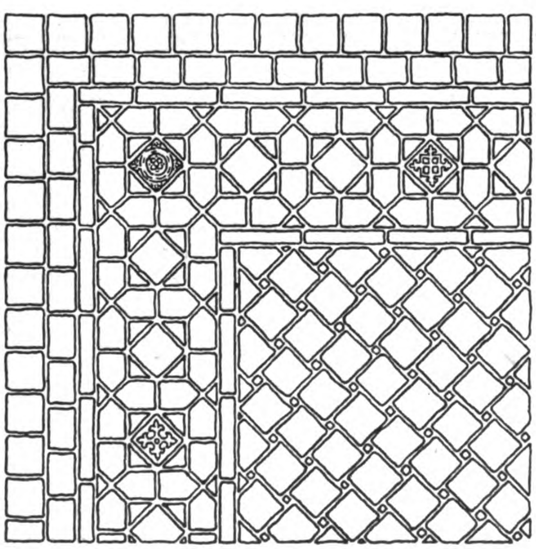
Tile work cannot be conceived without joints, and a rather dark gray natural cement joint is usually best, except for the delicate colors that demand a lighter tone. It is not desirable to match the color of joint and tile, for much of the charm in tile work lies in the play of light and shade in the individual surfaces.

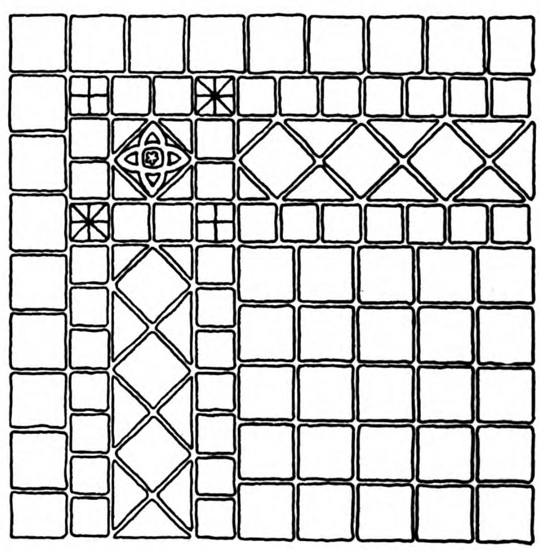
Proper setting of tile depends upon the efficiency of labor, and one of the most serious problems in the tile industry is a shortage of tile-setters, and of those available many are not especially skilled. Architects should do whatever lies in their power to increase the number of workmen and to aid in raising the standard of workmanship.

An illustration of the general misconception of the work of the skilled mechanic is that the ordinary brick mason is a competent fireplace builder. This idea is wrong as there are only a very few masons, aside from the skilled members of the tile-setters, who understand the principles necessary for this work. Theoretically the most perfect form of fireplace is when the width of the back is equal to the depth and the opening is three times the width of the back or the depth. Present conditions require modifications of these rules, but they could be more closely followed in many instances with better results.

Materials that reflect the most and absorb the least heat are the best to use for linings. Iron is among the very worst and fire-clay and brick among the best. The English custom was to plaster and whitewash the brick, white being the best reflector.

Other common misconceptions are those in reference to settlement, proper mixture of stock, floating or buttering wall tile, methods of grouting, crazing, overhead light and cleaning.





Examples of Elaborate Design for Tile Floor and Border

Certain materials other than tile are bound to settle and shift, and tile without elasticity fails to respond except to superior force. For the ordinary wooden construction the 2 by 4 inch should be spaced not over 16 inches on centers and should be braced at the line of the wainscot cap with 2 by 4 inch horizontal bracing. Joists should be braced every six feet with 1 by 3 inch cross bridging. When possible the joists should be lowered to the depth of the tile construction, allowing for a continuous form under the concrete. This form should be of 1-inch boards not over 6 inches wide, laid ¼ inch apart to allow for swelling. Some sort of a light metal binder should be used in the concrete foundation. Concrete should extend under tiled-in tubs and a copper pan or membrane waterproofing provided under shower baths. All tiled-in fixtures, including medicine closets, should be furnished and set by the tile contractor; and the use of wood or all-lead expansion sleeves for fastening fixtures should not be allowed.

Mixtures for the setting are in general as follows:

Concrete should consist of one part Portland cement, two parts sand and four parts gravel, crushed stone or cinders; or of one part cement and five parts coarse sand. Stone or sand concrete over wood construction should be 2 inches thick.

The setting bed for floor tile is usually ½ inch to ¾ inch thick and is mixed one part Portland cement to three parts sand. Over this mixture sprinkle dry cement and tamp the tile into place.

The preparation for tile wall work should always be applied by the tile setter, including the wire lath, when the walls are not of fireproof material.

The mixture for the scratch coat should be one part of cement to two parts of sand, applied not less than ½ inch thick and scratched horizontally. The setting bed for the wall tile should be one part cement to three parts of sand mixed with not over 15 per cent of lime, by volume, well worked in. All wall tile should be soaked for at least twenty minutes in clean water and set while wet.

In setting tile by the method known as "floating" the scratch coat is first applied and when this coat has hardened the wall is soaked, thin strips of lath to act as guides are bedded on, and the float coat applied between these strips. A coating of pure cement mixed to the consistency of thick cream is spread on and the tile beaten into the cement before it starts to set.

In the method of "buttering" wall tile, cement mortar is placed on the back of each tile, and each piece tapped in place separately with the end of the trowel handle.

The success of either method depends upon the skill and honesty of the setter, and proper supervision. The floating method is more commonly used in setting the smaller sized tile, but can be used for all sizes when the backing is rigid. Tile should be floated in small stretches, about 4 feet by 2 feet 6 inches and the mistake of placing tile after the set has started to take place should be avoided.

Objections to buttering are that there is no pure cement next to the tile and that the tile is not entirely bedded, leaving voids at the corners.

Proper grouting of joints has much to do with the life of tile work, especially in connection with ceramic mosaic. The reason is that the edge of this tile is not "fettled" or rubbed off at the factory, and sometimes too much paste is used in papering the tile for setting.

Grouting should be done by experienced men not later than the next morning after each day's work. The joints should be well brushed out, the tile washed with clean water before grouting and no one allowed on floor work for several days after it is completed. To avoid the yellow staining of light colored joints, wall tile should not be grouted for at least a day after it has been set.

Crazing of tile is caused by a combination of manufacturing and setting conditions, for at times the tile are crazed in the original packages, and at other times not until they are in place. Under present methods of manufacture, to quote from another article I have read on this subject, "Crazing is no more detrimental than are a few freckles on a pretty girl's face."

One of the worst conditions that a tile setter has to work under is when the room to be tiled is lighted by skylights or windows with deep reveals. The light exaggerates the least little variation in the thickness of the glaze, and yet a straight edge test will show the wall to be plumb and true. Often when the window shades and curtains are in place this trouble is largely corrected.

Satisfactory cleaning of tile floors depends upon whether the work has been given the proper initial cleaning by the contractor and whether proper instructions have been given in regard to the ordinary household cleaning. Vitreous tile floors can never be kept clean by indifferent applications of cold water, applied with a mop dipped repeatedly into the same bucket of dirty water.

A stiff scouring brush, plenty of clean hot water and a liberal supply of scouring soap or powder are indispensable. Too large a space should not be cleaned at one time and the surface should always be rinsed off with clean hot water.

Semi-vitreous or absorbent tile should be given at least one initial coat of oil or similar treatment under the direction of the tile contractor and further oiling will depend upon the tile used. The softer quarry tile requires several applications before the floor should be used.

Tile of this character should not be scrubbed with soap and hot water, but should be gone over several times each week with a damp mop. Mopping with cold water will help to set the oil polish. Periodically floors of this tile should be treated with a mixture of one pint of raw linseed oil and one bucket of damp sawdust. As the floor is brought to the desired tone less oil will be required. This mixture should be rubbed over the tile and joints with a broom or handful of excelsior, and if applied too liberally the entire mixture can be removed by washing with strong lye water. Do not expect floors, however well set, to look their best immediately.

Tiles for roofing purposes are manufactured in similar manner to those for floor and wall work. The shale or hard formation of clay, at least for one of the largest roofing tile factories, is cut by a special machine from a local shale pit. This machine mounted on wheels cuts a fifty-foot slice into a side hill and an endless chain of buckets deposits the shale in small open cars, to be taken to the filtering and grinding mill.

A tile roof can be constructed to harmonize in design and shade with any building, and now that slate and other roofing materials have so advanced in price, vitreous terra cotta roofing tiles are rapidly gaining in favor.

Briefly, the arguments in favor of terra cotta roofing tile are their fireproof qualities, a point generally recognized by insurance companies; their non-conductivity to heat and cold, which secures a result directly opposite to that from a roof of slates; their durability and artistic appearance.

In addition to the more common Spanish and French types of roll tile, there are the shingle tile, varying from the plain reds and browns to the rough textured grays and greens. A very interesting recent example of the more artistic shingle tile is their use on the roofs of the Harkness Memorial, Yale University.

Exactly as a fireplace builder is a specialist in his line of work, so should a tile-roofer excel in his work. A roofer familiar with the use of slate is not necessarily familiar with the use of tile. Roofs of tile should be laid by men trained in the line of work and who appreciate the merit of the material.

Any construction that is properly built for slate will carry tile safely and under some conditions no additional strength of framing is required to use tile instead of wood shingles.

It is an interesting fact that the snow-load on a tile roof is from 5 to 10 pounds per square foot less than that on wood shingles. This is due to the fact that the vitreous tile does not hold snow like a damp wood shingle. The total live and dead load carried by the rafters in connection with shingles is 37 to 53 pounds per square foot and for tile 38 to 55 pounds per square foot.

A properly laid tile roof calls for a layer of 40-pound asphalt felt to prevent suction, as well as copper valleys and flashings in connection with the tile.

This felt should be well lapped and laid parallel to the eaves. The use of copper nails to fasten the tile is of vital importance. The special tile against the hip boards should be pointed with elastic cement as well as where they lap each other.

Interior Showing Use of Hand Made Hexagons and Quarry Tile with Plain and Decorated Faience Tile
Richard Arnold Fisher, Architects

Notes from England

THE NATIONAL SHIPYARDS' HOUSING SCHEME AT CHEPSTOW

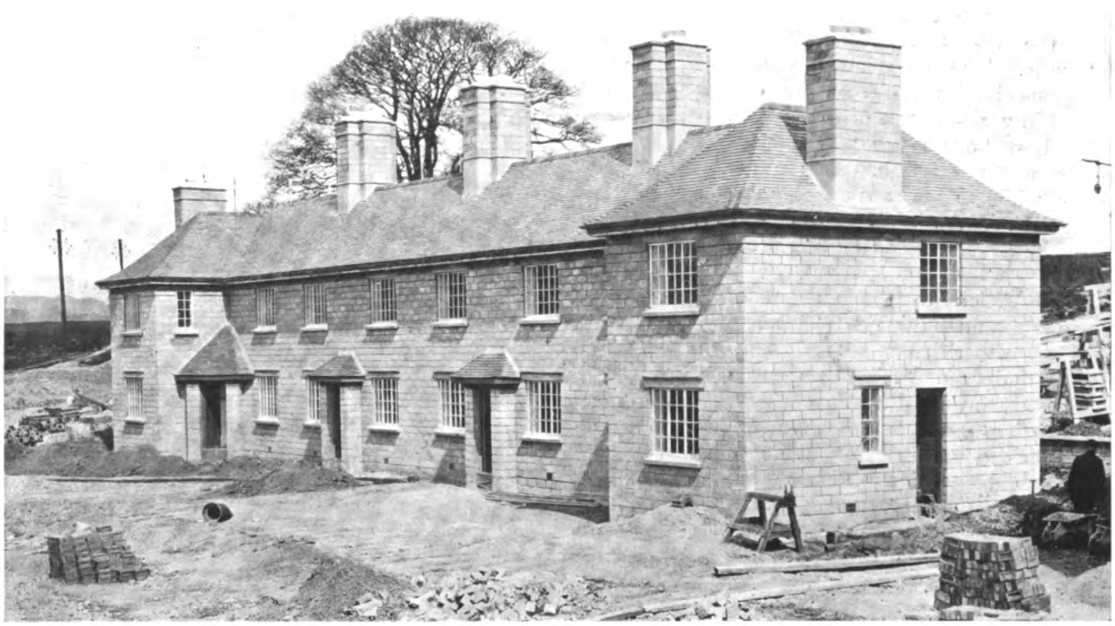
By H. J. BIRNSTINGL, A.R.I.B.A.

DESIGNED to meet a specific and temporary emergency, most of the additional housing accommodation that was required in different parts of the country during the war was frankly of an ephemeral nature. One of the most notable exceptions to this general rule is the National Shipyards at Chepstow.

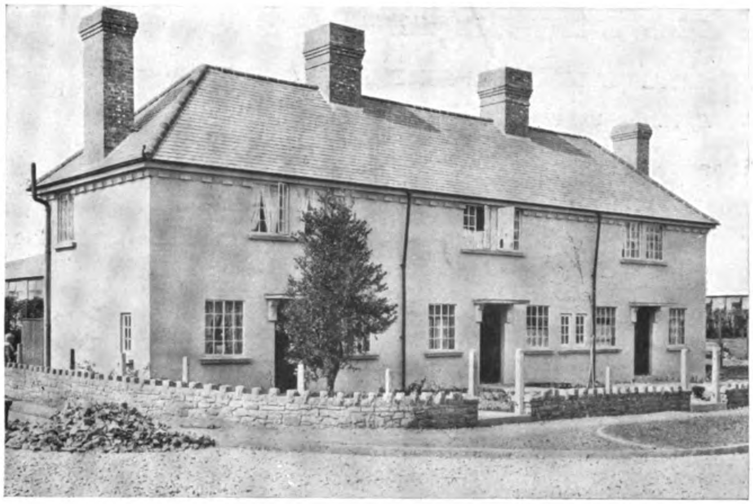
At the time when the shipyard was taken over by the British Admiralty it was found that a housing scheme to accommodate 7,500 workers and their families was required, and it was decided to develop some of the existing villages, combining them into a comprehensive town planning scheme. Already a start had been made in the village of Hardwick by private enterprise which provided 267 houses, the architects being Messrs. Dunn, Watson & Curtis Green, and the next village to be undertaken was Bulwarks, planned to contain 1,150 houses and to form a combination with Hardwick, the two villages being connected by paths through the woods.

The situation of these villages is as beautiful as anything in the country. They lie on the southern slope of hills overlooking the broad waters of the Severn and the Wye and full advantage of the natural beauties of the site, with its pleasant prospects, was taken in determining upon the lines of development. An interesting feature about the whole scheme is that all the houses are built of concrete. This is, indeed, the first instance in England where this material has been so extensively used for small buildings. A few years earlier popular prejudice against the employment of this material would have prevented its use on such an extensive scale, but during the war the impossibility of obtaining brick in adequate quantities became a deciding factor in the choice of materials.

A layout plan of Bulwarks village is shown in Fig. 1. It will be seen that the main business center is situated along Thornwell road and in planning the disposition of the buildings a feature has been made of a fine old oak which, protected by a raised bank that covers its roots, is approached by a flight of steps affording an eminence from which a view is obtained along the avenue to the woods beyond. From the avenue a series of axial roads extend, adhering approximately to the contours of the ground. The first of these roads, appropriately called Alpha road, ends with a raised Roman camp surrounded by fine trees. The houses on this road are of the "A," or non-parlor, type, containing a living room, kitchen or scullery, three bedrooms and a bathroom. These houses were the first to be erected and some fifty of them were occupied within



"B" Type Houses at Pennsylvania Village. Fig. 2. Henry E. Farmer, F.R.I.B.A., Architect



"A" Type Houses on Alpha Road, Bulwarks Village. Fig. 5

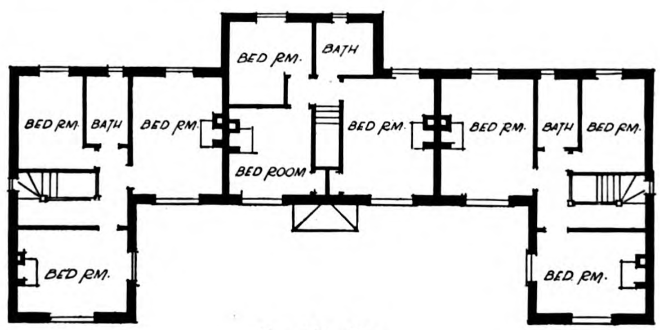
three months from the beginning of the undertaking. A commencement of the "B," or parlor, type was made on Beta road. The avenue terminates in a large, open, circular space in which is a bandstand surrounded by seats. From this point the ground falls away rapidly. The whole arrangement, both architecturally and naturally, is such that it gives a distinguished center to the locality.

The schools are placed in wide, open spaces and in order to economize in road frontage which is, owing to the high costs of road construction, expensive, houses are placed around the schools which are reached by subsidiary paths. The Church of England closes the vista of Church road and beyond, adjoining the woods, are the vicarage grounds. The churches of other religious bodies are suitably disposed in various parts of the village. The best houses are placed with their north elevations facing the camp while to the south a magnificent view is obtained over the Wye and the Severn which lie sixty feet below.

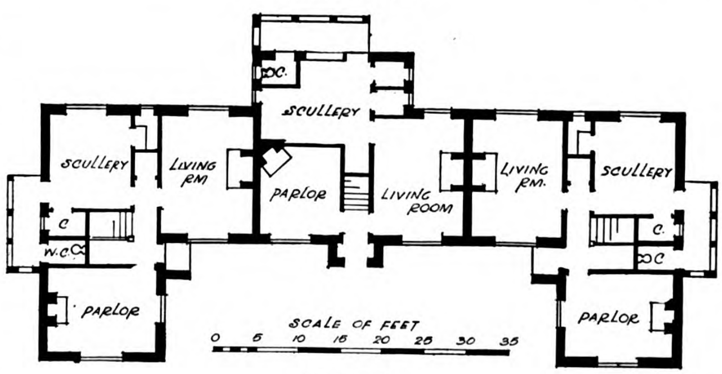
In addition to the villages of Hardwick and Bulwarks the scheme includes Buttington village, composed mainly of "A" type houses which are intended to house, near the plating sheds, the workers who are required to be always at hand. Other villages included in the scheme are Pennsylvania and Sedbury. These are now well in hand. These villages are perhaps more pleasantly situated than those already described, having views of the Wye cliffs and the mellowed walls of Chepstow Castle to the east while at the foot of the village, to the south, can be seen the merging of the two rivers.

In considering the scheme as a whole it was decided to spare the picturesque old village of Chepstow with its tortuous, narrow streets and its port wall and to construct new and wide roads for fast and heavy traffic which would thus be diverted from the narrow Chepstow roads. These new roads would connect up the developed villages on the north and south. This whole scheme is so large in extent that it is difficult to give in a limited space an adequate idea of all that it contains and a few plans and illustrations of some of the completed houses must suffice as an indication of the diversity of treatment that has been adopted.

As has already been said, the difficulty of obtaining brick in sufficient quantity became a determining factor in the choice of materials. Another acute difficulty was transportation and where suitable aggregate and sand are obtainable the transportation can be confined to cement which is approximately one-sixth of the bulk.



Second Floor Plan



First Floor Plan

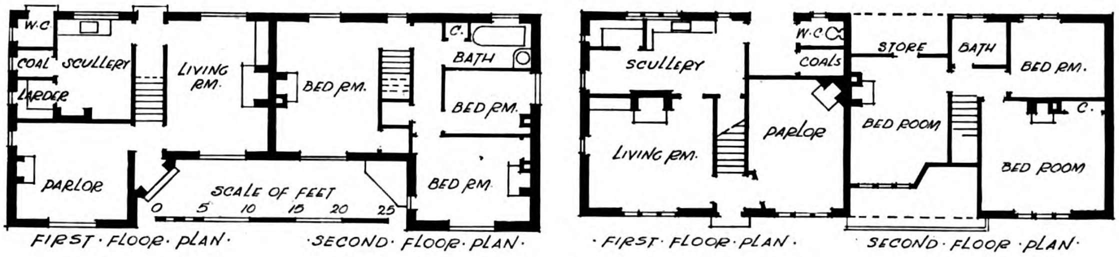
Three Unit Block of "B" Type House

Plan of Bulwarks Village. Fig. 1

Therefore the method of concrete construction adopted was that of blocks manufactured on Winget machines. A semi-dry mixture is used with these pressure machines, and the construction is that of the straightforward cavity wall type with iron ties, the inner leaf having a proportion of "breeze" aggregate, avoiding condensation. The continuous cavity successfully excludes the heavy driving rains to which the West of England is subjected. The interior wall surface requires only two coats of plaster and in some cases only a skimming coat is employed. As far as possible the houses are designed to avoid much cutting and to minimize the manufacture of special blocks. For the same reason the doors and windows are standardized to a few types of sashes and casements. It is, of course, inevitable that a certain number of special blocks must be made for chimneys, sills, door hoods and the like, and particular care has been devoted to the designing of these parts.

The illustrations give some idea of the variety of treatment that it is possible to obtain, even with the use of concrete blocks made from one type of machine. The significance of this fact would not require such insistent emphasis in America where the possibilities of concrete have for some time been fully recognized, but in England it is to many almost in the nature of a revelation that this material is capable of yielding such varied and pleasing results. In the houses shown in Fig. 2 it will be seen that the blocks are not covered, and since the building unit

"B" Type Houses at Bulwarks Village. Fig. 4. Henry E. Farmer, F.R.I.B.A., Architect



Typical Floor Plans of "B" Type Houses

is moderately small the scale is not lost as is so often the case where too large a block is employed.

A complete contrast with these houses is afforded by those in Fig. 3 which, with their long sweeps of roof line over the doors, have a more rural appearance. Fig. 4 depicts a more formal and classical treatment with elegantly proportioned sash windows and widely overhanging eaves. The paneled stacks, string courses and porches show how much the effect of such buildings may be improved by the judicious use of well designed details. Considered purely on its architectural merits, perhaps, the group most deserving of praise is that shown in Fig. 5. Here is seen all the modest reticence of early nineteenth century work; plain and unpretentious, it is entirely satisfying and yet at the same time it is no dull replica of buildings of a past age; it shows, rather, the adaptation of the old idea to modern requirements. That the unit is not of brick is at once apparent in the bold dentils of the cornice.

An idea of the internal disposition of the rooms may be gathered from the few plans that are shown. In all cases great care has been taken to obtain the best aspects for the various rooms; sunshine is all too scarce. The work at these villages was designed and carried out by Mr. Henry E. Farmer, F. R. I. B. A., until March, 1919, when His Majesty's Office of Works took over the project. There were then some hundreds of houses completed, in addition to most of the roads in Bulwarks and Pennsylvania. The hospital, electric generating station and all the shipyard buildings were also finished and since that time much progress has been made on the whole layout.

The houses in this development may be taken as typical of many that are now being built under the government's housing plans or by various local authorities, many of which are now well advanced. It may, indeed, be said that the housing situation is rapidly improving. It is now less than fifteen months since the Housing Act became law, but already contracts for nearly 200,000 houses have been approved.

A visitor to any one of the villages included in this development will be impressed with the tasteful and attractive appearance which prevails, due to the care of engineers and architects in planning the layout of the villages and the effort to make the houses homelike and livable. This marks a great advance over the usual industrial housing development and the successful result is an encouraging indication of the higher standard of village planning which will develop in the future.

Two "B" Type Blocks at Bulwarks Village. Fig 3. Henry E. Farmer, F.R.I.B.A., Architect

A Modern Swiss Country House

AN INTERESTING ADAPTATION OF ENGLISH PRECEDENT WITH SWISS DETAILS

ERNEST KUHN, ARCHITECT

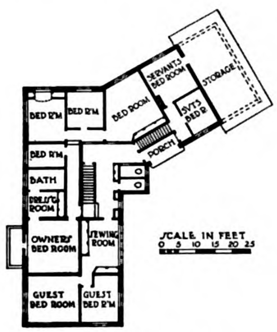
THE influence of architectural books and periodicals in modifying traditional architectural types is seen in every country. The interchange of ideas which is made so easy by the medium of the press is developing especially in domestic architecture composite types that reflect inspiration from many different national sources. Thus the subject of this article is a country house in Switzerland which is quite distinctly English in its plan arrangement and general exterior composition. There is a sufficient survival of Swiss forms in its details, however, to make it a natural product of a Swiss architect, and it is in this mingling of styles that its special interest lies.

The house is situated on rising ground with an approach to a forecourt on the north side. The principal rooms are given a southern exposure and overlook the garden. The winters in Switzerland are long and a southern exposure is necessary for comfortable interiors. There are no rooms on the third floor and the servants' quarters are grouped on the second floor of the wing.

In arranging the plan the principal rooms on the first floor were given greater height than the others in order to maintain good proportions. The dining room and the southern half of the living hall have this extra height and the second floor is so arranged that the space over this portion of the house is occupied by the owner's suite, consisting of main bedroom, dressing room, bath and child's room. This is reached by three risers and a landing over the start of the main stairs. Note should also be made that a private corridor connects these rooms so that they are a unit independent of guests' and servants' quarters. The servants' rooms are also grouped separately but when necessary, communication with the main part of the second floor is had through the open porch.

The large living hall is divided into two parts by a deep beam supported by square posts, the part near the entrance serving as a reception room. This division is further accentuated by a plaster barrel-vaulted ceiling over the front portion while the remainder of the room has a high, square, wood paneled ceiling.

The interiors are characterized by well detailed paneled walls and ceilings. In the living room the walls are oak and the ceiling, pine stained to match. The upholstery and hangings are figured material in blue and yellow and black. The walls of the front portion are covered with a small figured blue cloth. The entrance hall is a typically Swiss room; the boldly carved wood newel and stair balustrade being the work of a self-taught craftsman who



Second Floor Plan

First Floor Plan

View Entrance Front from Forecourt

View of Typical Bedroom

on the second floor, pine covered with felt and linoleum. The hardware, lighting fixtures and principal furniture were designed by the architect.

The house walls are built of brick with stucco coating. The Swiss have developed exterior plastering to an efficient degree; it is waterproof and is capable of being worked into mouldings and ornament that stand up surprisingly under severe climate conditions. The first coat is composed of ground sand, cement and lime and in this the rough mouldings when used are worked. This coat is not waterproof. The finishing coat is entirely weatherproof and is composed of a patented mixture in which the color which comes in a wide range is a component part. It is a quick setting cement and is applied to the undercoat to a thickness of only about one-fifth of an inch. It is generally troweled smooth and the mouldings are trued up with a template. The porch columns are artificial stone and the base course also of this material in a red tone.

works in the manner of the medieval workers without drawings. The carved portions are of cherry wood as are also the stiles and rails, the balance of the woodwork of walls and ceilings being pine stained to match the cherry. The walls of the upper hall are rough white plaster. Interesting features of the play room are the miniature stage and antique green tile stove. The floor is linoleum with padded angles ; this play room floor covering is to be removed later on.

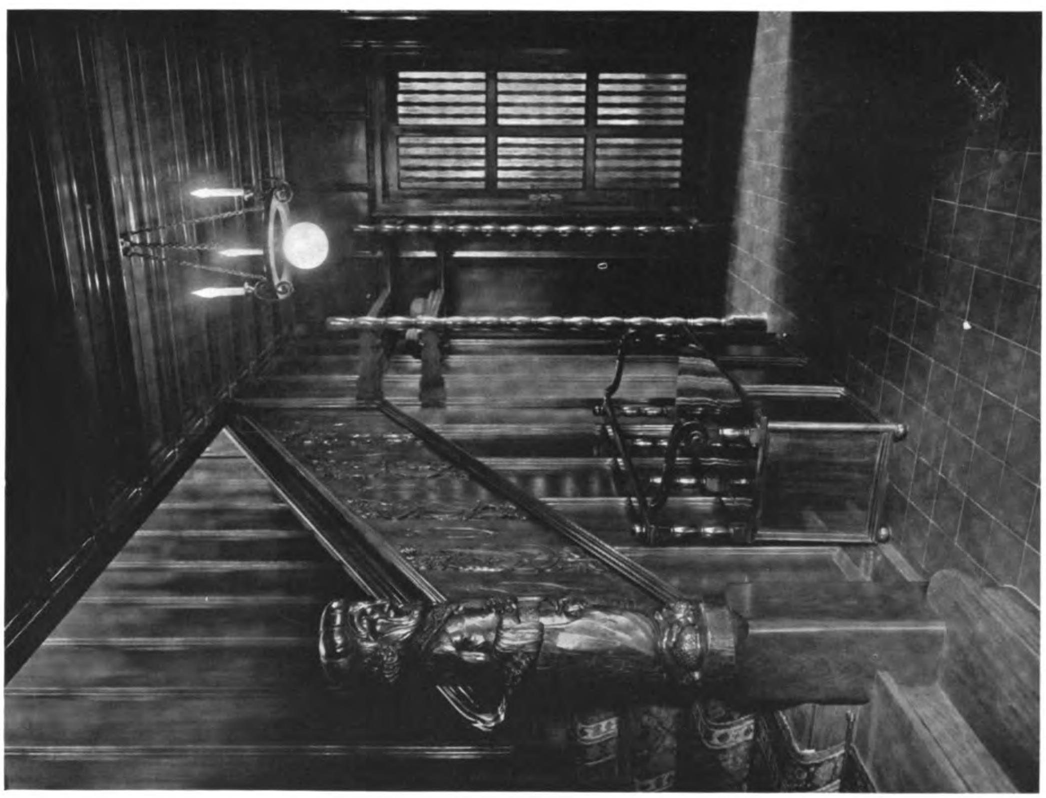
The floors throughout the first floor are oak and

On the exterior the use of color is depended upon to relieve the severity of the large plaster wall surfaces. The roofs are covered with shingle tile ranging in color from brown to black. The soffit of the

Detail of Living Hall

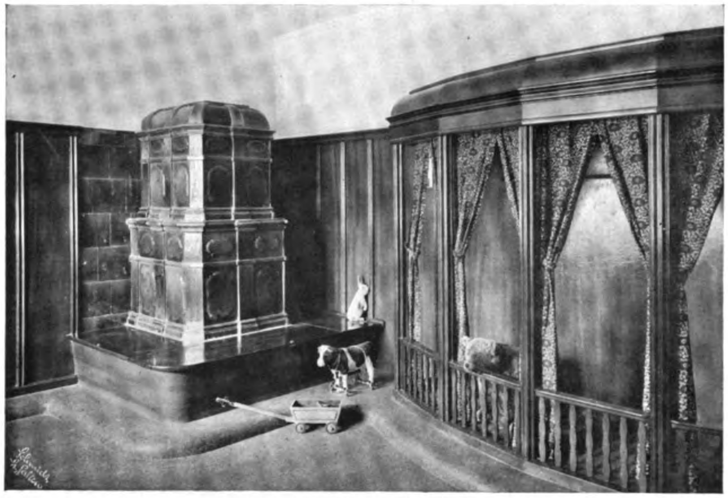
Detail of Studio

BAY END OF LIVING HALL



STAIR HALL FROM ENTRANCE

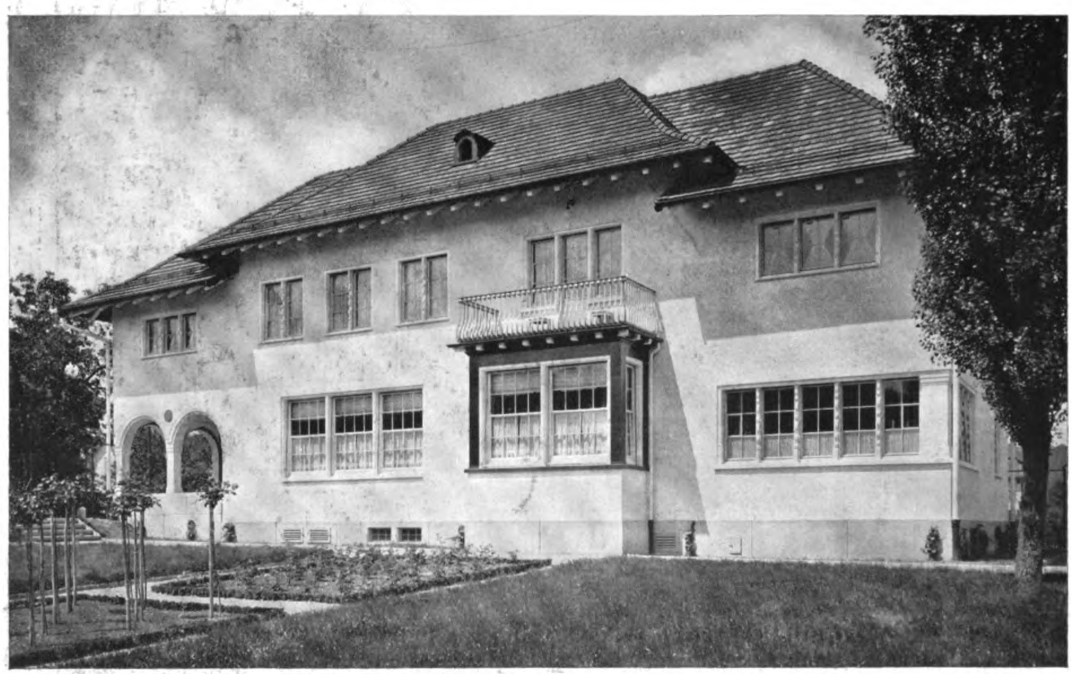
ERNEST KUHN, ARCHITECT



Play Room in Service Wing

cornice is brilliant with white rafter ends appearing against red painted roof boards and gutter. This red appears again as the color of the bay window on the garden side and in the doors which are cherry, carved in Swiss patterns. The plaster walls have a pink cast and a narrow band of plaster in white outlines all of the windows. A detail recalling the wood forms of Swiss peasant buildings is the queerly cut mullions. The windows on the forecourt side and the roof of the bay on the south side have iron grilles that are gilded. Terra cotta is also used for small pieces of decoration at a few points such as in the arch spandrels of the porch and for brackets supporting the beams that carry the overhang of the roof on the wing. These are modeled to represent different grotesque heads similar to the one illustrated.

The wider use of color is a feature of design to which American architects could give greater thought. As a general rule our handling of color is timid, everything is grayed for fear of creating a garish effect, but in stucco buildings particularly bright colors in small areas can be made extremely effective in giving life and vitality to the plain walls. Very often surprisingly successful effects may be had by the simplest use of well chosen colors on such wooden exterior details as window trim and blinds, soffits, cornices and doors.



View of Garden Front

Early American Domestic Architecture

III. THE WARNER HOUSE, NEAR CHESTER, CONN.

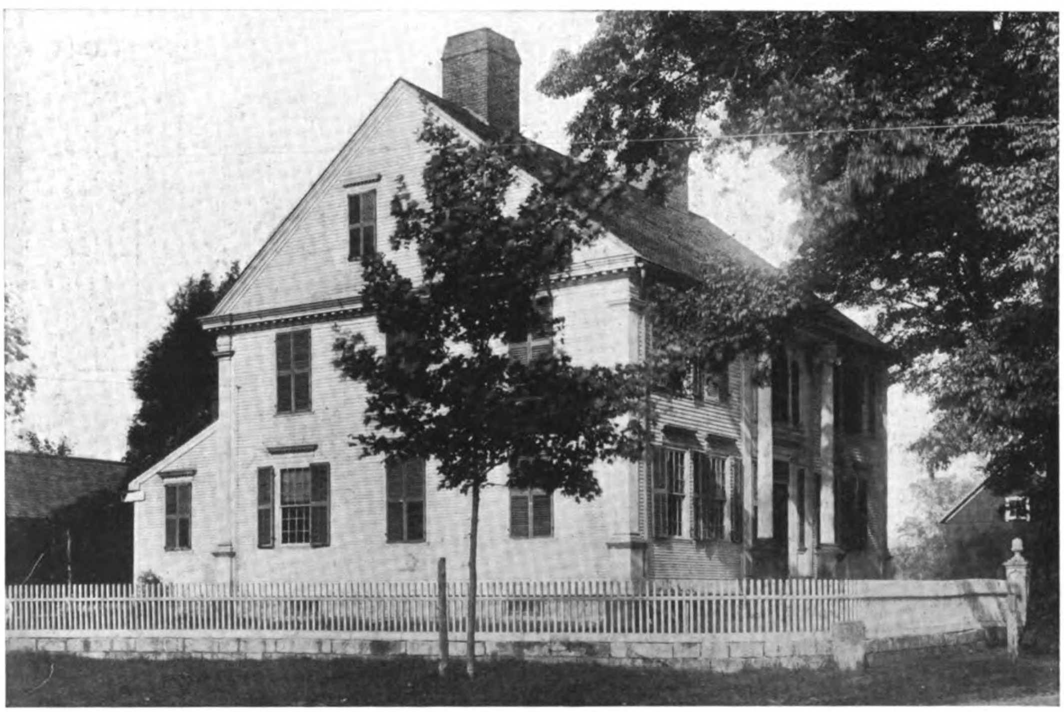
MEASURED DRAWINGS BY J. FREDERICK KELLY

THE work of the early builders of Connecticut during the decade extending from 1790 to 1800 was chiefly characterized by admirable proportions, fineness of scale, and elegance of detail. With but few exceptions, the finest houses of this period are to be found in the Connecticut River valley and its vicinity. It is definitely known that some of these more pretentious houses were entirely constructed and finished throughout by ship-carpenters.

The Warner house, built in 1793, which stands on the west side of the river, a short distance from Chester, and near the old Chester-Hadlyme ferry, is a typical example of the architecture of this period in Connecticut. The name of its designer is not known, but he was evidently possessed of considerable architectural skill, fine taste and a remarkably sensitive feeling for scale and detail. A close examination of both the exterior and interior detail makes it apparent that the designer was either working largely from his memory of classical forms, or departed deliberately from the conventional, especially in the composition of cornice and architrave groups.

In spite of its comparatively late date, this house exhibits very sturdy framing, the vertical posts projecting into the rooms at their corners. The story heights are comparatively high, and this, coupled with the excellent proportions and extremely fine scale of all the interior woodwork, produces an agreeable impression of openness and dignity which is not too cold or formal.

The main façade, largely due to the unusual arrangement of its central motif, is of great charm and interest. The two free-standing columns, of attenuated proportions, flanking the main entrance, and mounted upon superbly cut pedestals of Portland stone, give the house a singular air of grace and elegance. It is highly probable that these two columns originally supported a small pediment of low pitch; for an inspection of the attic displays certain evidence which suggests an alteration at some time subsequent to the original date of building to that part of the roof where this feature would occur. The exterior covering of clapboards laid in courses of graduated exposure is an interesting persistence of an arrangement belonging to a considerably earlier period. The effect produced by the very gradual increase in width or "weather" of each course of clapboards approaching the main cornice is very pleasing, and a decided factor in the scale of the whole exterior.

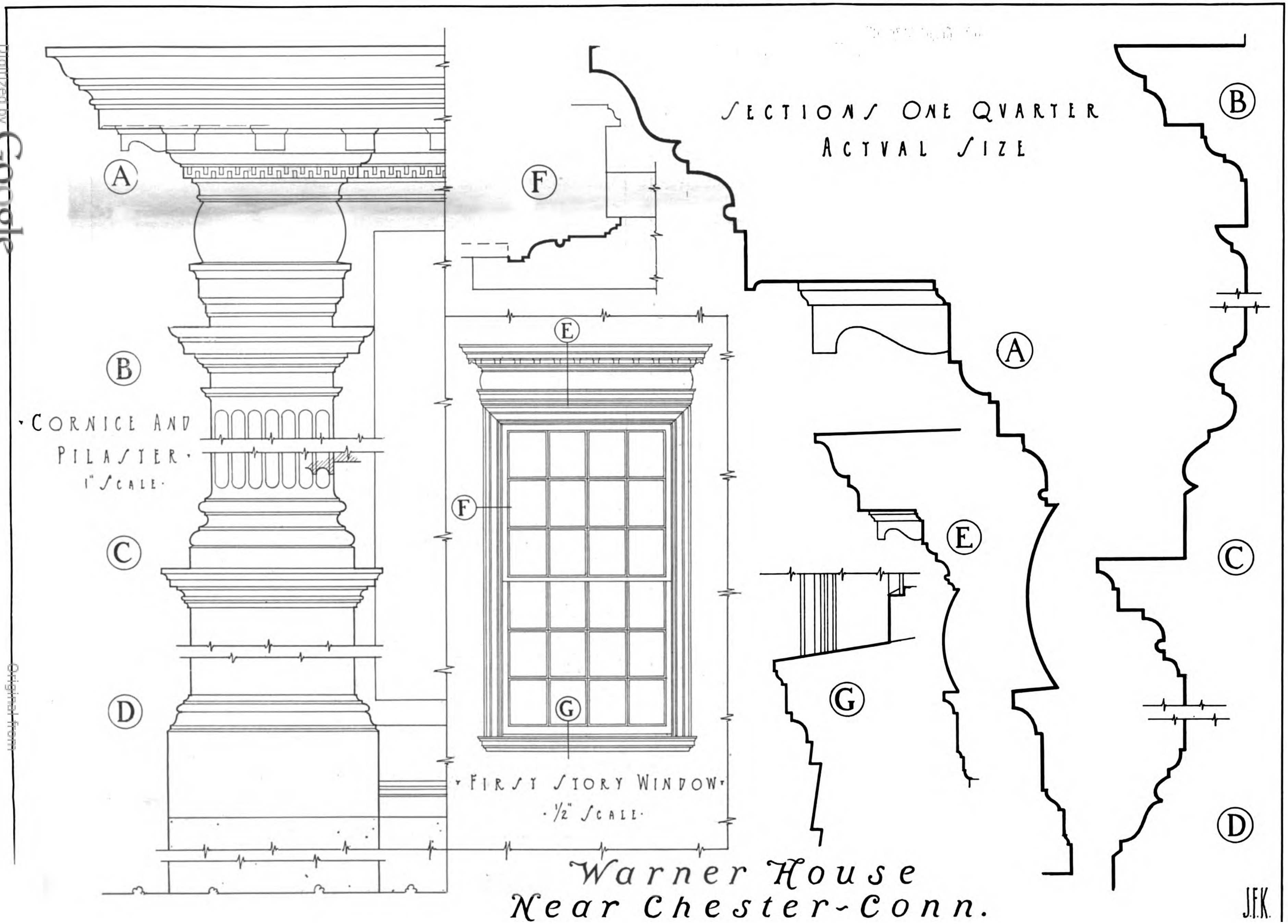


General View from the Roadway

FRONT ELEVATION
SCALE 1/8" = 1'-0"

Warner House - Near Chester - Conn.

JFK


SECTIONS ONE QUARTER
ACTUAL SIZE
A
B
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D
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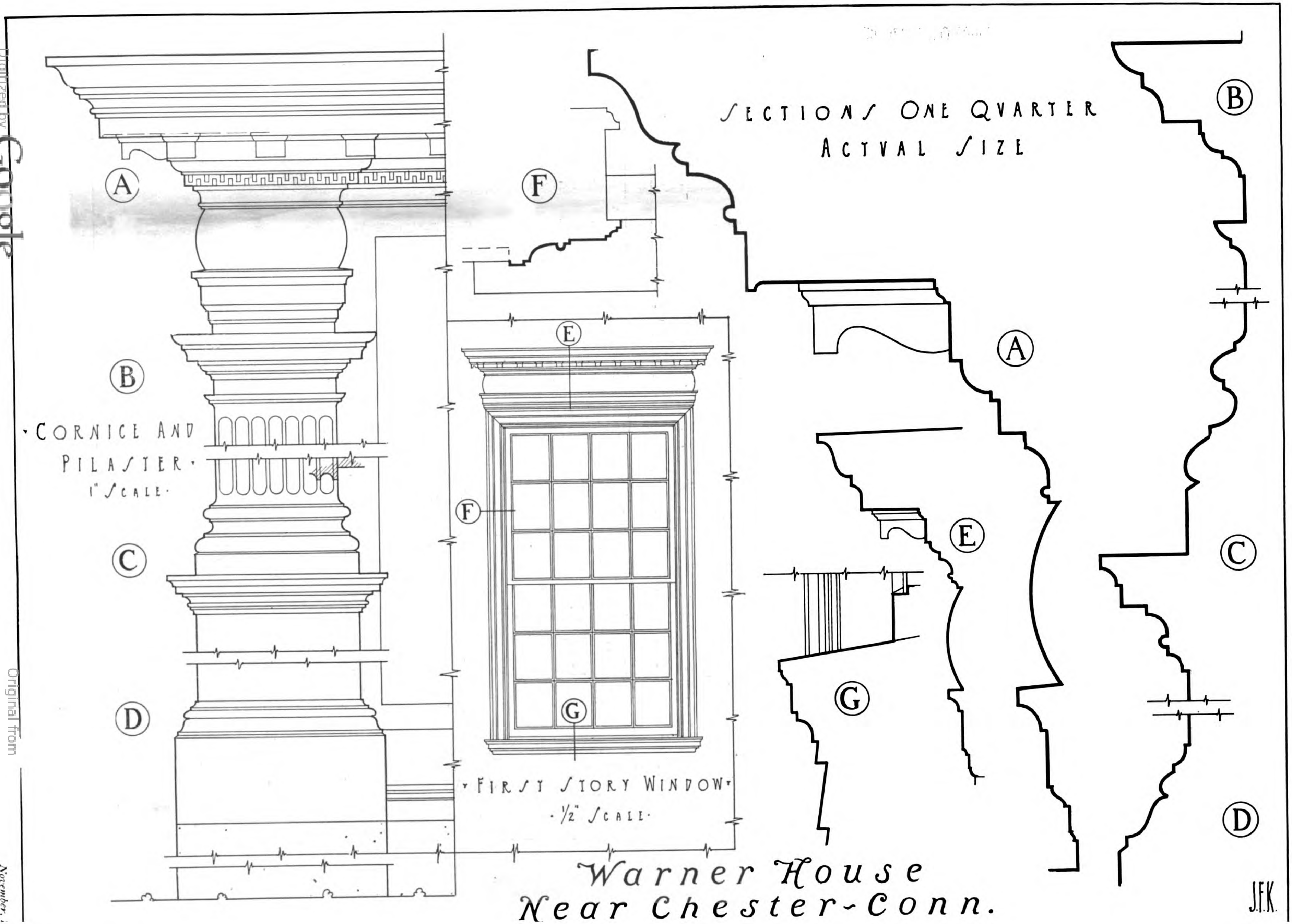
G
CORNICE AND
PILASTER
1" SCALE
FIRST STORY WINDOW
1/2" SCALE
Warner House
Near Chester-Conn.
J.F.K.

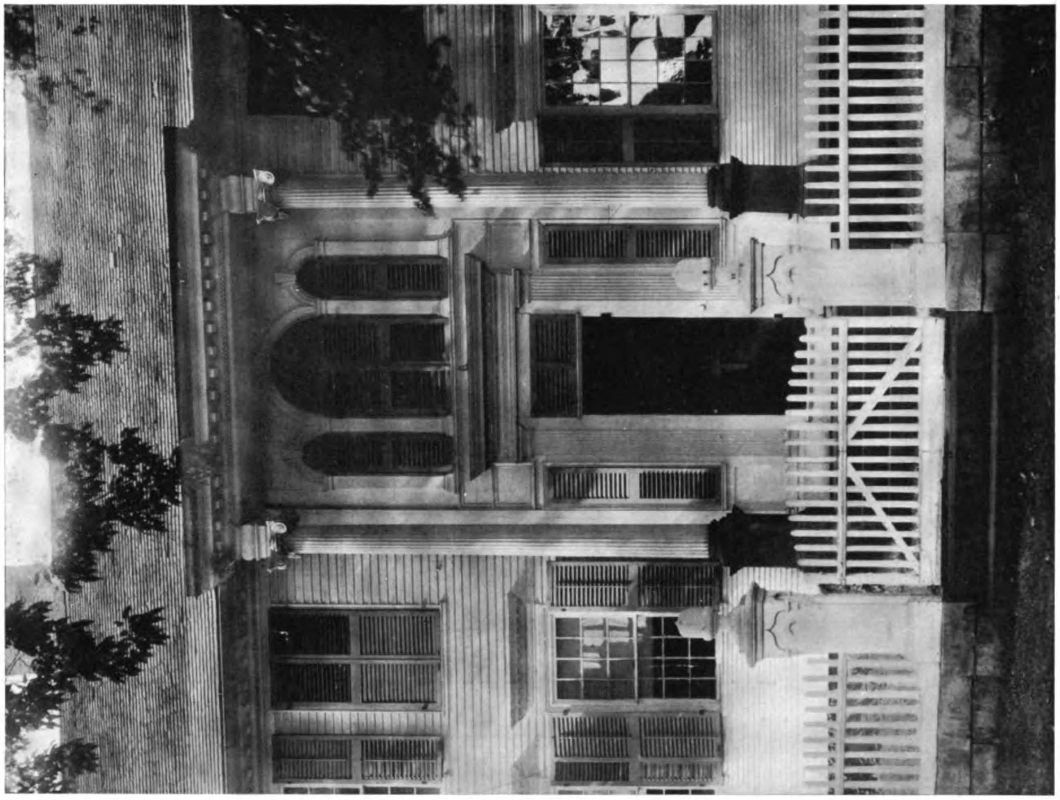
FRONT ELEVATION
SCALE ⅛" = 1'-0"

Warner House - Near Chester - Conn.

JFK



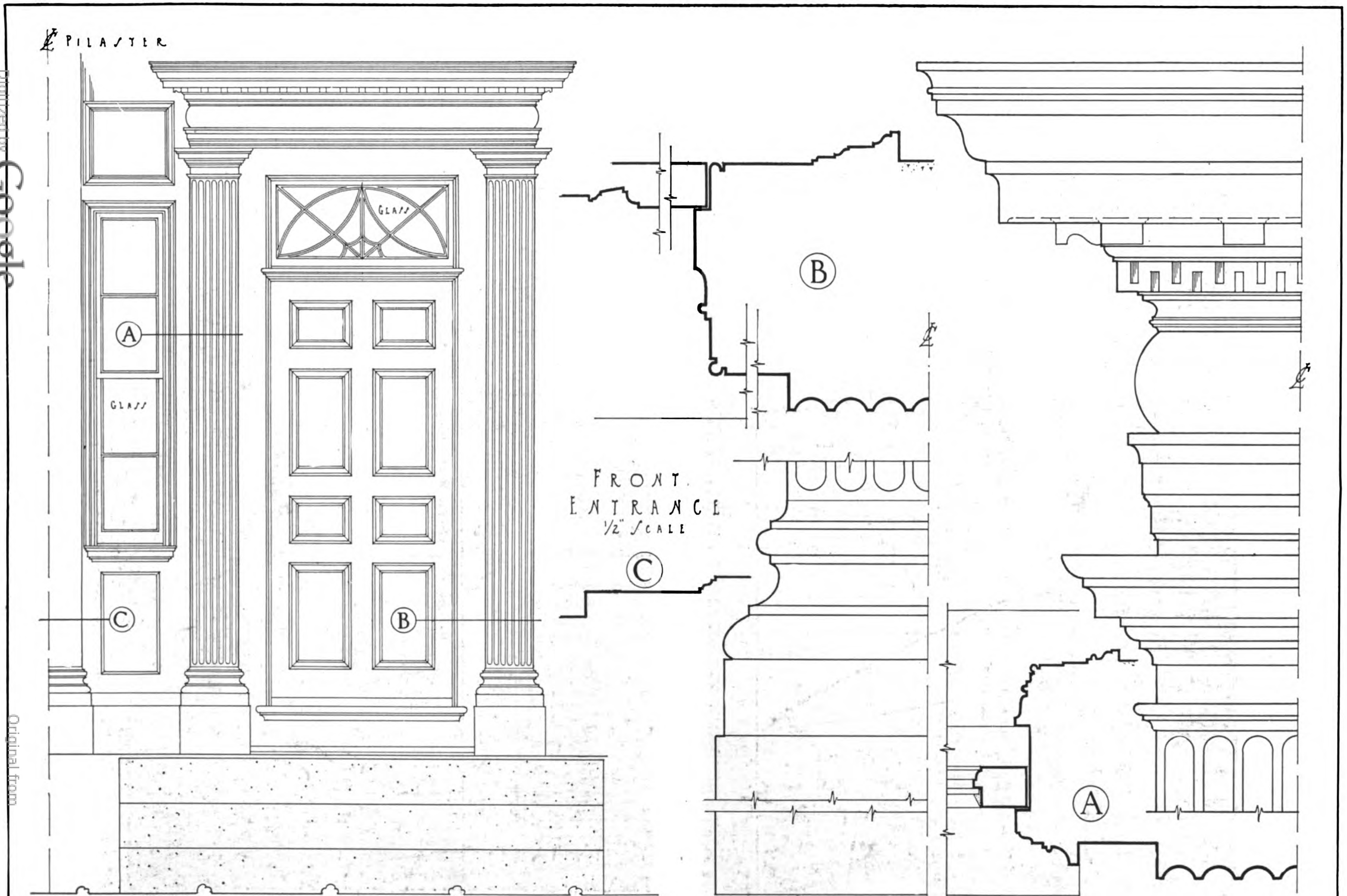
Warner House
Near Chester-Conn.



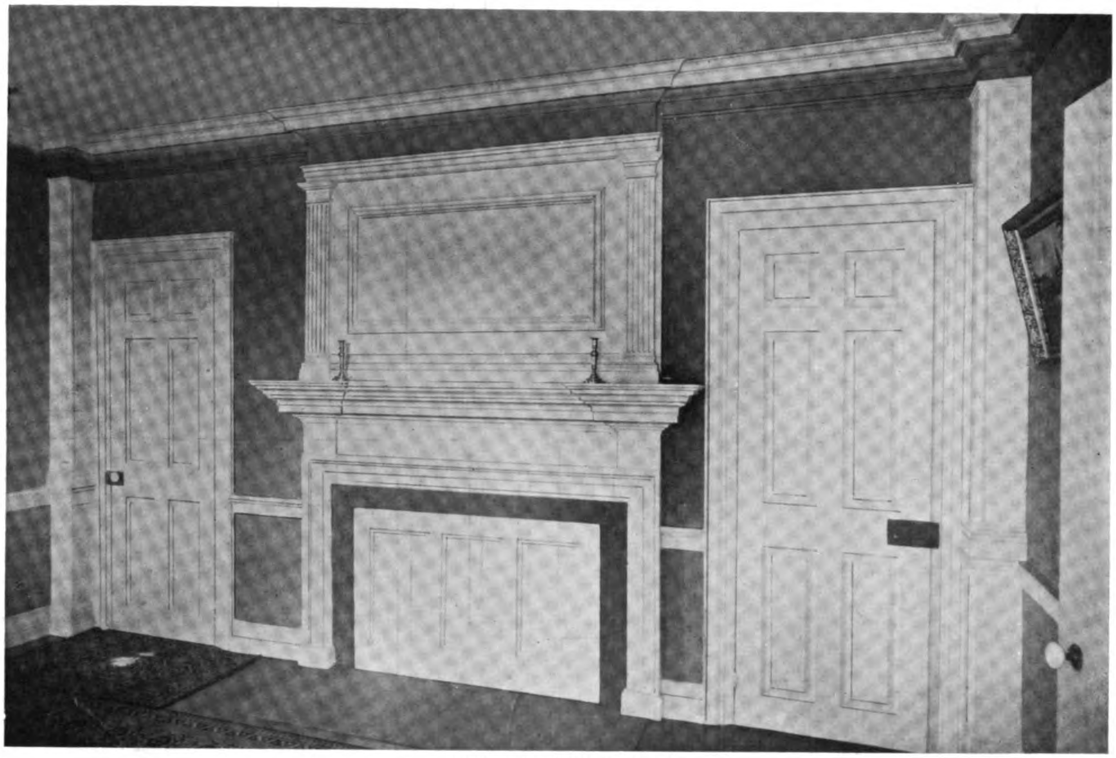
VIEW OF ENTRANCE PORTICO

DETAIL OF ENTRANCE DOORWAY

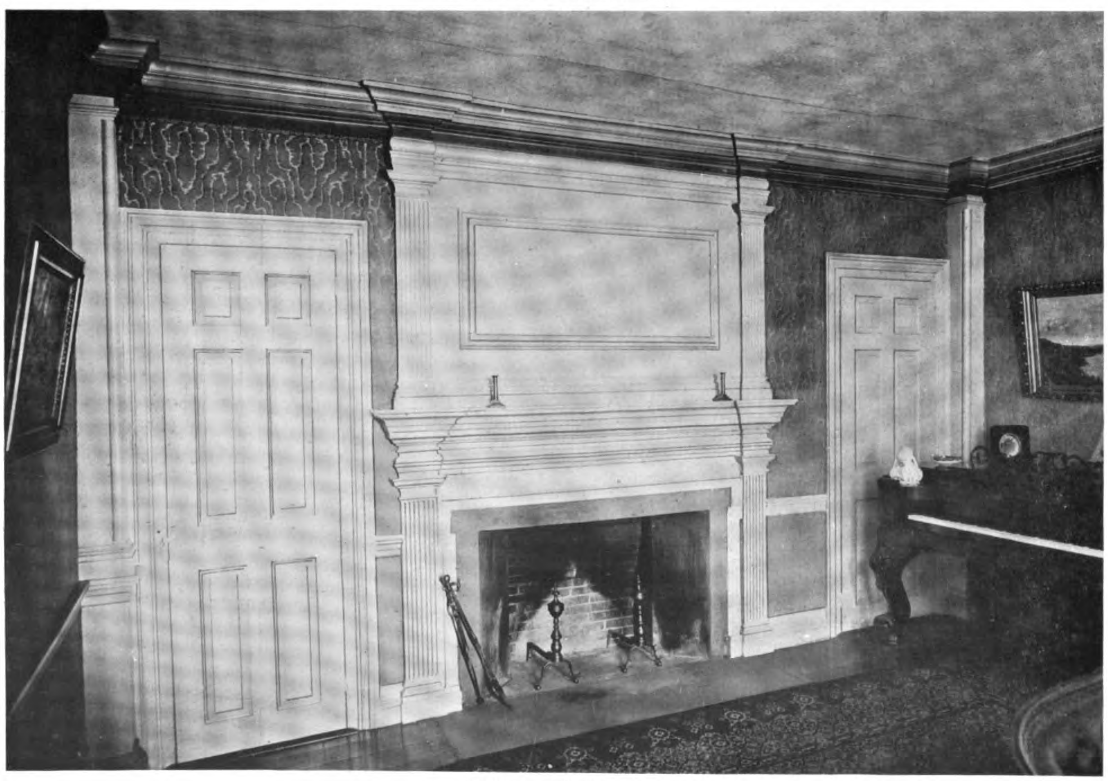
THE WARNER HOUSE, NEAR CHESTER, CONN. BUILT IN 1793



Warner House-Near Chester-Conn.

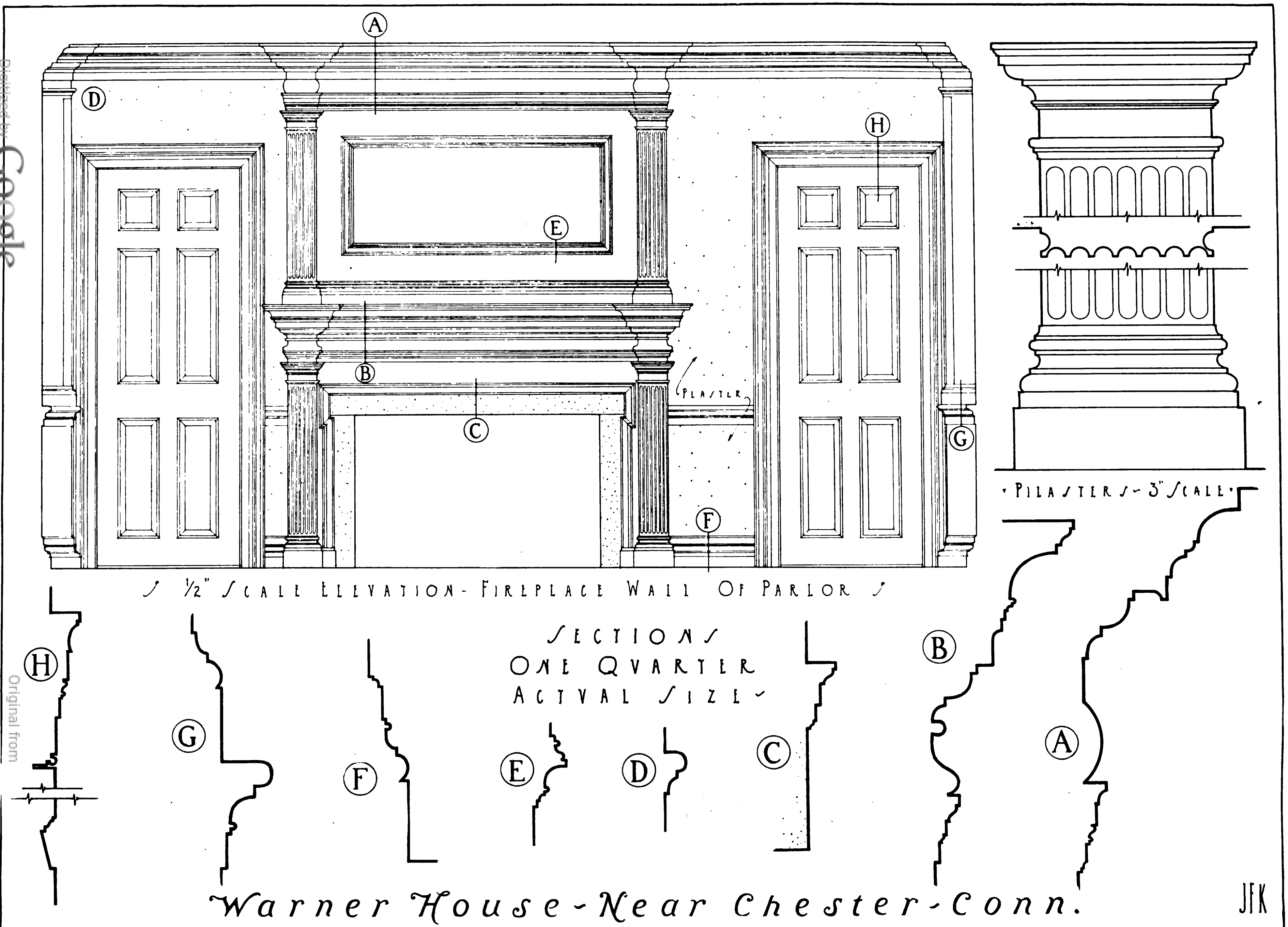


DETAIL OF LIVING ROOM



DETAIL OF PARLOR

THE WARNER HOUSE, NEAR CHESTER, CONN.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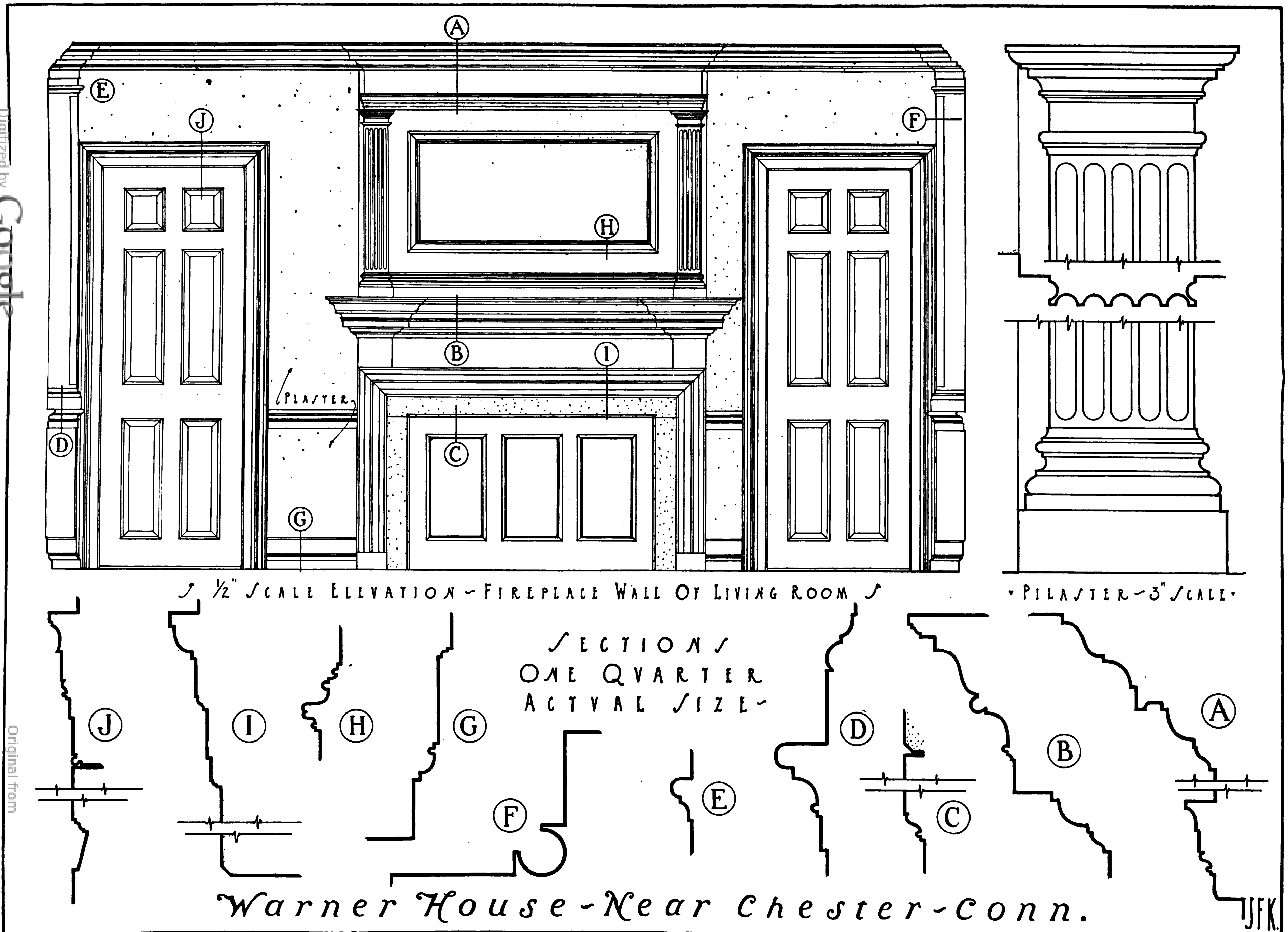
PLASTER
½" SCALE ELEVATION - FIREPLACE WALL OF PARLOR
PILASTERS - 3" SCALE
SECTIONS
ONE QUARTER
ACTUAL SIZE
Warner House - Near Chester - Conn.
JFK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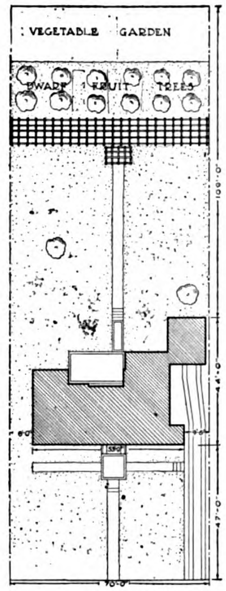
PLASTER
½" SCALE ELEVATION - FIREPLACE WALL OF LIVING ROOM
PILASTER - 3" SCALE
SECTIONS
ONE QUARTER
ACTUAL SIZE
Warner House - Near Chester - Conn.
JFK.

A House for Practical Convenience

CHARLES Z. KLAUDER, ARCHITECT

THE small house is a problem which comes to the attention of architects more frequently than any other. In many offices it has been looked upon as a necessary evil and as a consequence it was dismissed with the minimum amount of special study in the usually vain hope that there might be a small balance when office expenses were charged against the commission. For a good many years it has had a more or less standard solution and there were few or no reasons to demand anything different.

The high cost of construction today, however, coupled with the expense and difficulty of obtaining servants has brought about a decided change in house planning which requires more detailed consideration of the problem than formerly. It is, furthermore, distinctly an architect's problem—satisfying the present day demand for an artistic home with modern household conveniences in small space and at a moderate cost imposes a burden that none but an experienced and practical designer can meet. The small house problem will undoubtedly increase its demands on architects, and to do the subject justice they should interest themselves in it and charge a fee in proportion to the work involved.



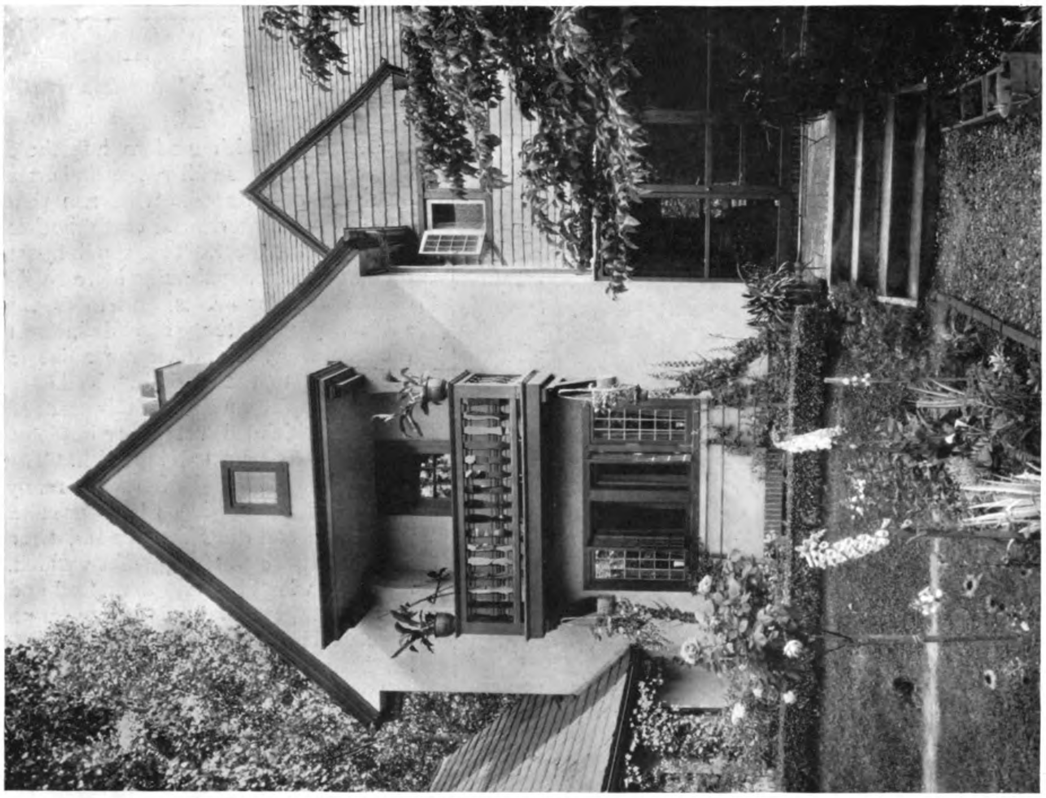
Plot Plan

An example of a successfully planned house in which this procedure has been followed is illustrated herewith. The architect's clients had spent many years in gathering ideas from popular periodicals and other sources and came to him with a host of suggestions which, however, when properly appraised and sorted out, gave the basis of a program from which a most successful servantless house has been built.

The property is a suburban plot with a frontage of 70 feet on the street and a

View of Entrance Front from the Street

DETAIL OF ENTRANCE FRONT



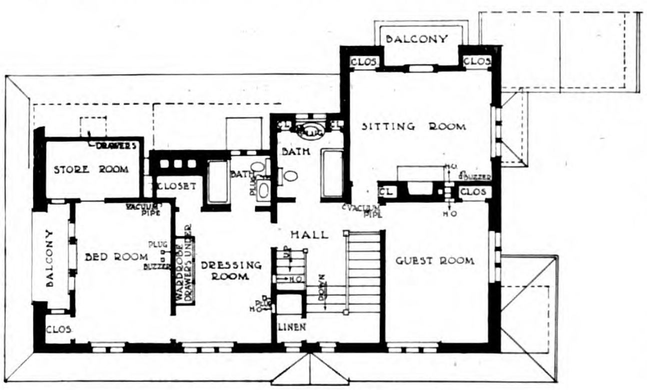
DINING ROOM BAY FROM GARDEN

A SMALL HOUSE AT MERCHANTVILLE, N. J.
CHARLES Z. KLAUDER, ARCHITECT

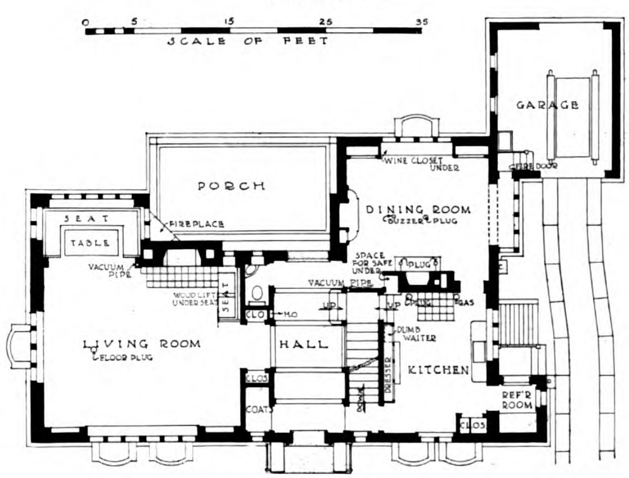
depth of 200 feet. The house was placed 47 feet back from the street, which leaves the larger part of the plot available for a rear garden. The garage has been attached to the house both for convenience and to maintain the garden space undisturbed. Attractive evergreen planting along the base of the house, a hedge that marks the grass terrace and a rustic fence at the street line give a sense of privacy to the house despite its closeness to the street.

The plan is L shaped which provides a square living room with light on three sides and an open paved terrace in the angle overlooking the garden. The house is conducted without any servant, which required the position of the kitchen to be in convenient relation to the other rooms but at the same time to be completely isolated when desired. This room has been placed at the front of the house, affording a pleasant view toward the street; it connects directly with the dining room and with the hall through a lobby near the main entrance and again at the start of the stairs. This arrangement eliminates all extra walking to reach either the entrance or the second floor. There is no pantry, the necessary space for storage of supplies and dishes being provided in a large built-in dresser; a closet with a single door but divided back of it is fitted for keeping brooms and pots. A refrigerator room with drain into the sewage system adjoins the kitchen and serves as a vestibule.

Garage Wing from Garden Terrace



Second Floor Plan



First Floor Plan

In the kitchen are evident some of the features which are designed to reduce household work. Cooking is done by gas and electric ranges; dish washing is also done by an electric machine, the necessary plugs for the connections being at convenient points. A dumb waiter built into the wall dresser gives communication with the laundry below. The hearth on which the ranges set is of quarry tiles and the chimney breast of white enameled brick. The sink is placed at a suitable height to prevent stooping over when working at it and for further convenience a swinging seat is attached to one of the legs. The back of the sink is tiled. A servery built at the side of the chimney breast in the dining room and practically concealed from view in that room enables all materials for a meal to be placed in it from the kitchen. Below it a safe is built in for silver.

In the space under the refrigerator room the gas and electric meters are installed; the entrance to the cellar is through this space and thus the meter room can be left accessible to inspectors when the remainder of the house is closed.

Stairway Showing Door to Kitchen

The garage is reached through a small door inconspicuously placed in the side of the dining room bay. An automatic fire door is provided at this point of communication.

In the dining room an attractive built-in sideboard is a feature. Between the china closets on either side of the windows facing the garden is a wide sill of Tennessee marble with honed finish for plants and below it a wine closet of fair size is arranged.

The living room has a number of flush bookcases and an interesting nook for reading and writing at the left of the fireplace. This has casements on three sides; the table and seats are built-in and the radiation concealed under the seats. The seat at the right of the fireplace conceals a wood lift which connects with the cellar. A hinged top to the seat makes the wood accessible.

The second floor contains an owner's suite of bedroom, dressing room and bath, a sitting room with fireplace and a guest room with a general bathroom opening from the hall. The bathrooms were especially studied for convenience of arrangement and also to give them some element of actual design. The floors and wainscot are of tile; the tubs are built into the wall with concealed piping, the latter, however, available for repairs through small doors inserted in the partitions back of the tubs. The lavatories are placed on higher pedestals than usual to avoid stooping and the windows placed above them.

Other details which were followed to eliminate work in caring for the house were plastering the interior of the cellar walls, a damp course of slate in the exterior walls just above ground level, numerous electric outlets throughout the house for lighting fixtures and electrical appliances, complete piping for vacuum cleaner service, and leaded, outswinging casement windows.

View of House from Garden Pergola

ARCHITECTURAL & BUILDING ECONOMICS DEPARTMENT

C. STANLEY TAYLOR, *Associate Editor*

Successful Co-operative Apartment Buildings

By FREDERIC CULVER

DURING the past few months considerable editorial space in THE ARCHITECTURAL FORUM *has been devoted to co-operative building finance. So much interest has been shown in this subject that we have arranged to give additional data prepared by Mr. Frederic Culver, President of Culver & Company, who has had many years of successful experience in the promotion of such projects. This article by Mr. Culver, and other articles to follow, will give definite information based on his experience. Mr. Culver will be glad to answer any general questions on the subject which may be directed to him through the office of* THE FORUM. — *Editors*

IN New York (times being propitious therefor) owners of many older apartment buildings have proceeded to shift the individual ownership of their properties upon the shoulders of a group of those pressed to seek habitations. This has been done under the name and in some cases under the general plan of co-operative ownership of apartment buildings which, to a large extent, had long before been successfully carried into practice in this city.

Such enterprises designed to relieve owners of carrying charges will, in general, violate every principle which should justify the creation of a co-operative apartment organization. In the opinion of the writer great adverse criticism of co-operative apartment organization will result in the future from the unskilled and unstudied movement of the character which has already taken place, and it is to combat the effects of such criticism and to popularize the movement that the writer has been led to publish some interesting facts connected with well considered and successful co-operative apartment developments.

It is safe to assume that no residence designed for individual occupation can be produced or operated as economically as a building of the same character designed for group occupation. When you add to this the many burdens thrown on an individual in the administration of his individual unit, you touch one of the potential causes leading to group living in city and suburban districts. Add to this economies practiced by commercial landlords, want of proper scrutiny of tenants allowed to rent in large buildings, unexpected, inconvenient and inordinate increases of rent and many similar annoyances and you have other causes which impel wise people to turn to group building.

A purchaser of stock in a co-operative building, reflecting the savings derived by quantity production and carrying only a reasonable profit to the promoter-constructor, acquires a habitation suited to his requirements cheaper than it could be produced in any other way. When the operation is concluded the stock should be worth more than it cost. The owner of the stock also enjoys the advantages of co-operative administration, has a voice in the management of the property, can treat his own apartment in any way desired, is forever free from increases of rent and in a comparatively short time amortizes his principal investment through the savings made.

A co-operative apartment building should discard everything which costs money without adding commercial value. All lines and proportions should be used for architectural effect to the exclusion of expensive materials, and the apartments should be completed in the simplest manner possible, leaving the occupant to make his own expenditures on the interior treatment. These features, coupled with a fixed rent for 95 years, make for the economy and pleasure of this type of ownership and occupancy.

The floor plan having been adopted, disinterested real estate experts, with knowledge of local renting values of the district, should be asked to appraise the renting values of the various apartments and on these disinterested opinions of revenue values and expert advice as to operating expenses the whole financial structure should be based. The profits to be made by the promoter-contractor for all services in the conception, planning, financing and erection of the building should in no instance exceed 15 per cent of the total cost, and this should be the only profit in the enterprise; otherwise, in most cases, it will penalize the investor.

After satisfactory title insurance is obtained and a demand for the stock is manifested the enterprise should proceed. The voluntary purchase of the stock of such an enterprise is the justification for its creation. Such an enterprise can safely assure to the owner a return of from 10 to 15 per cent annually on the investment, either in occupation or through sub-letting. Those who promise rent free or benefits more exaggerated than this are treading on dangerous ground although, in the experience of the writer, in a few exceptional cases this has happened. After all, operations of this character can only be successful in a large way when the investing public has confidence in the ability and integrity of the promoter and the knowledge that the profits are

Apartment Building on East 66th Street, New York

moderate and that the investor has the benefits of a mass production.

Co-operative apartment enterprises are bound to live and increase in number. When well conceived and executed their merits are not to be disputed, but the ability of the investor to sell at any time is a very necessary condition, and this can be satisfactorily accomplished only when full market value is given the original investor. In addition to this, the organization which has produced any such enterprise must give the assistance of its selling force to any patron who desires to dispose of his holdings.

Groups of such prospective tenant-owners are formed usually in one of two ways: either by their own association, determining on a site and a price they can pay, or by the action of a promotive constructor bringing such a group together. The action cannot be speculative. The demand for the operation must precede its creation.

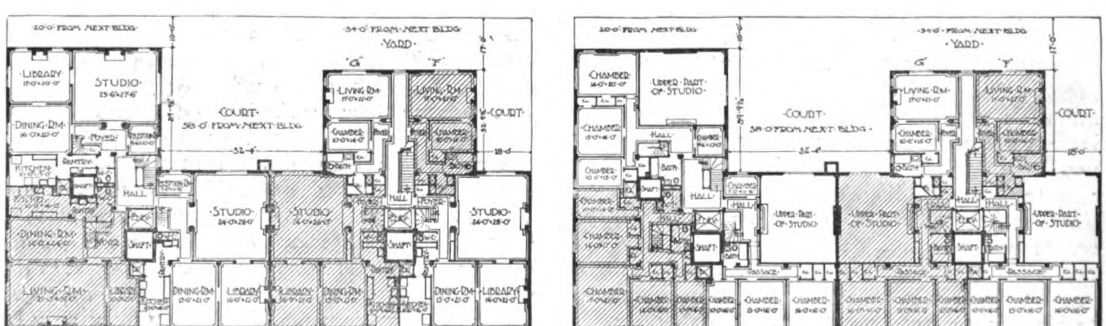
The best of skill should be displayed in the selection of a site which will probably increase in value and having, so far as possible, good surroundings and the advantages of light, and in its acquisition at a price not exceeding its fair and reasonable value. The same skill must be displayed in planning the types of the various units of apartments to be produced.

The crux of the whole transaction, however, is whether the appraised commercial renting values fixed on the various apartments by disinterested experts will show a proper saving to the tenant-owners. If, on this appraisal, the cost of the operation is too great, the enterprise should be abandoned.

The service profits on one of these co-operative enterprises should, for *all* services including building profits, law, architectural, promotion and selling, not be so great as to place a burden on the co-operators which will manifest itself in depreciated value of their securities. There is here no legitimate field for promotion *per se* or which promises the impossible and takes out of the enterprise a compensation which can in no way be justified.

Readers of this article will undoubtedly be interested in a few facts and figures regarding several successful co-operative apartment buildings which have been developed in New York during the past 15 years.

Nos. 131–135 East 66th Street—On plot of 170 feet front by 100 feet deep is this 11-story fireproof building of which Charles A. Platt is the architect, completed in 1907. This property cost the co-operators \$890,000, represented by \$308,000 of stock and \$582,000 of mortgage. The unit blocks of stock were \$16,000 and \$18,000. The rents of



Plan of Typical Main and Typical Mezzanine Floor, Apartment Building on East 66th Street, New York
Charles A. Platt, Architect

apartments in the proposed building were appraised at from $3,200 to $5,000. On these rentals the enterprise saved the co-operators from the start over 12 per cent annually on their investment and in 1920, due to increased rent values, about 25 per cent on their original investments. The building is worth today not less than $2,000,000. Blocks of stock sold before the war for about $35,000 and are now sought at $50,000. In this operation good judgment was displayed in the selection and purchase of the site; the building is large and its management has been good.

No. 925 Park Avenue is on a plot 100 feet by 100 feet at Park avenue and 80th street and was planned by Delano & Aldrich. Blocks of stock in this building were originally sold for from $20,000 to $24,000 which can be had today for not less than $60,000. The saving to stockholders has always been from 12 to 16 per cent annually before the war and the writer estimates that these savings are now about 25 to 30 per cent. The same care as to selection and purchase of site and management has been shown in this enterprise as in the instance previously noted.

50 West 67th Street—The promotive and building profit on this building, of which Shape & Bready, Inc., are architects, was figured very low and as a result the building was produced at a loss to the builders. The writer is advised by a tenant-owner that he is living in the building rent free save for the interest on his investment. This interest is a sum which is a very small proportion of the commercial value of the rent of the apartment occupied by each tenant-owner.

These examples could be multiplied but it suffices to say that on the statistics gathered in 1916 by the writer from the owners of several million dollars' worth of successful co-operative apartment buildings in New York, covering a period of years, the average saving to tenant-owners amounted to 14 per cent on the aggregate investment.

Experience has shown that a definite plan and method of developing any co-operative building project must be worked out in careful detail. In view of this fact it is necessary to know definitely the ultimate cost, renting values, maintenance charges and similar figures required in developing a proper prospectus for the operation.

Apartment Building at 563 Park Avenue, New York
Walter B. Chambers, Architect

Apartment Building at 863 Park Avenue, New York
Charles A. Platt, Architect

The Placing of a Cost-Plus Building Contract

I. OBTAINING BIDS AND SELECTING THE CONTRACTOR

SOME tendency is now noticeable toward a return to the old method of fixed-price bidding by contractors. At the same time it is apparent that a great proportion of the construction work to be done in the next year or two — particularly on larger projects — will be done under some kind of cost-plus contractual relationship. When a building contract is made on a cost-plus basis the architect retained to carry out plans and supervision has placed upon him a great responsibility in protecting the owner's interests. This is the first of two articles which will point out important factors and methods involved in placing contracts on this basis. The second article, which will appear in the December issue of THE FORUM, *will be entitled, "Necessary Organization and Methods for Supervision."* — EDITORS

THE definite responsibility placed upon an architect who, in behalf of his client, arranges any type of cost plus contract for building construction is so evident that it requires little discussion. Regardless of safeguards, a cost-plus contract of any nature offers certain possibilities of exceeding cost estimates which must be met through careful supervision on the part of the architect. It is assumed that the average owner who is investing his money in a building is not competent to check the expenditures in work of the contractor and in many instances the architect is called upon to render this important service. It is evident, therefore, that an architect rendering service of this nature must be equipped with a good business knowledge of actual conditions in the building field and that he must have, through personal capacity or on the part of personnel in his organization, such necessary and practical forces of supervision as will provide a definite check, not only on expenditures but on their efficiency and on the quality of workmanship and materials put into the building.

Removing Elements of Risk

Sufficient thought and experience have developed the fact that the straight cost-plus contract is not advisable under any circumstances. This fact is well understood by good contractors, as shown by the type of advertising done by large contracting organizations and by the methods used in selling their services to the architect and to the owner.

A careful analysis of the results of existing and recent contracts shows rather definitely that the best form of contract so far devised is what is known as the cost-plus-fixed-fee contract with penalty and bonus clause; and it would seem that the architect can safely recommend this form—a contract fair and acceptable to the contractor and affording a definite measure of protection to the owner.

The development of this type of contract may be briefly described as follows:

1–Complete plans and specifications are prepared by the architect.

2–A carefully detailed estimate of necessary labor and amount of material is made by the contractor and submitted to the architect, together with a statement of available materials and all the definite sub-contractors figures.

3–On a basis of the total of the costs of labor and material the contractor estimates a lump sum as his profit, this being known as the fixed fee.

4–The contractor agrees to a penalty and bonus clause through the operation of which his fixed profit fluctuates according to the relation of the final cost of labor and materials to the original estimate.

The first important point is to fix the fee which a builder is to receive for carrying out the work. This is usually done by having prepared a carefully estimated cost and the fee determined at a rate varying from 7 to 10 per cent of its figure. This definite amount is to be the contractor's payment for expert service. Many reputable contractors go further than fixing the fee, to the extent that they are willing to introduce a penalty and bonus clause. This is worked out by various methods, one of the better methods being an agreement by which this fixed fee is increased or reduced in proportion to the amount of saving or over-run on the estimated cost. Some contractors are accepting work on a basis whereby they agree to bear one-half the excess cost. The exact details of the cost-plus arrangement are therefore matters of agreement among owner, architect and contractor, but the important feature lies in definitely fixing in advance the contractor's profit and in penalizing him in some manner for excess cost.

The next important question is the possibility of placing cost-plus work through the medium of bids received from contractors. Considering several contracts which have been recently placed in this manner, it is quite evident that contractors may be asked to bid on cost-plus work without the responsibility attached to a bid placed in the usual fixed-price method. To do this the architect prepares his working drawings and specifications and invites several reputable contracting firms to place bids in accordance with a list of requirements attached. These requirements in general may be:

(1) That the contractor is willing to work under a fixed fee, bonus and penalty type of contract as selected by the architect.

(2) That the contractor will carefully estimate the costs, getting figures from sub-contractors and material dealers to cover the major portions of the work, and submit these figures as part of the bid.

(3) That the contractor is willing to allow close supervision by the architect's office, and that he will file with the architect regularly during the course of the construction such definite information as may be required to check the work.

(4) That wherever the owner or architect finds it possible to obtain lower sub-contract or material figures than those contained in the contractor's bid, these may be substituted to provide a saving for the owner.

Having invited several contractors to bid under such conditions as may be imposed through some such schedule as that outlined, bids will be received in due course and the question of what contractor is to be awarded the work may be definitely settled. There will, of course, be several important points for consideration in examining the bids made by various contractors. The first of these is the fixed amount asked by the contractor for carrying out the work. The second is the cost of the work as estimated by each contractor. The third is the general experience and reputation borne by a contractor as an important factor to be considered in relation to the bid which he makes. It is evident that selection will not be made because of the lowest fee or the lowest estimated cost, nor always because one contractor may bear a better reputation than another. An important point involved is the judgment and analysis by the architect. Upon examining the bid which shows the lowest cost figure, it may be found that certain portions of the work have not been estimated. It is evident, therefore, that the architect should carry out an independent quantity survey and estimate in order that the bids may be quickly checked. Further examination of the bid will show in general the quality of material which the contractor proposes purchasing, together with the class of sub-contractors whom he proposes to employ. Evidently, the fairest manner in which the contract can be awarded is to give due consideration, first, to the practical manner in which the estimate has been made, and then to the standing and experience of the individual contractor. While one contractor may be willing to work for 7 per cent of the estimated cost, the employment of one who asks 9 per cent for his services may prove advisable, if he is undertaking the work in a businesslike manner which promises to show a definite saving on construction cost for the owner.

The very act of passing upon the bids received in the process of letting work on a cost-plus basis imposes great responsibility on the architect who may be called upon to advise an owner in this connection. Any architect who has had actual field experience and who is closely in contact with conditions in the material and labor markets is in a position to render good service in this connection. If the architect himself is too busy or not equipped for the details of such supervision it is evident that he must have a properly trained member of his organization, able to talk directly to the building contractor in a manner which only familiarity with construction conditions and actual experience in the field can develop.

It should be realized—as will be more specifically explained in the next section of this article—that supervision must not be so impractical or so close that the contractor is hampered in carrying out the work which he undertakes. The relationship between the architect and the average building contractor is at best strained because of different view points. Frankly, the average building contractor is not often favorably impressed with the architect. This fact is undoubtedly due to lack of co-operation on a proper and businesslike basis in the interests of the owner. We must admit that this condition is often the fault of the architect because he designs his building and draws up his specifications without consulting a practical builder when he has not the direct experience and knowledge requisite for actual field application.

This brings out the fact that the architect who places the cost-plus contract for an owner must expect to maintain daily and intimate contact with the work as it proceeds. He will be called upon to approve all purchase orders and payroll expenditures. The responsibility for the selection of materials is placed entirely upon his shoulders. He will have direct relationship with sub-contractors because they have been retained under his approval and often by his direction. In the selection of a contractor who is to do the work, therefore, it is not simply a question of selecting a large contracting organization known for the volume and merit of its work, but the architect should insist on some knowledge of the personnel of the field force which the particular contractor expects to employ. The contractor undoubtedly has in mind some individual who will be field superintendent and it is well to check up the records of the man or men who will deal directly with the architect.

It might be remembered, also, that the size of a contractor's organization is not always important; often large contracting firms will have more work than is justifiable, while some smaller organization having a personnel of experienced builders is seeking work and is willing to do it on a basis of reasonable profit. The architect's judgment in selecting the contractor is therefore called upon to weigh the insight, ability and standard of each contractor, often in the light of past experience, and not only of the organization but of its representatives who will be placed directly upon the work in question.

"Selling" Architecture to the Man on the Street

MANUFACTURERS' PUBLICITY INDICATES VALUE OF ARCHITECTURAL SERVICE

By S. HOWARD MYERS

DURING the past two years there has been much heated discussion on the subject of architectural advertising. Opinions have been freely given for and against a program of education to develop a more fundamental and widespread appreciation of the value of architectural service. Up to the present nothing of a definite nature has been done by architects in the United States except in a few isolated, local cases.

It has remained for a number of manufacturers prominently identified with the building industry to take the first step in driving home to the man on the street through the medium of advertising that better building can result only through the larger use of the services of architects.

Two advertising campaigns which are now in progress in magazines of popular circulation are of particular interest to the profession. One is the advertising of an individual manufacturer whose product is of a utility type; the other is the advertising of a group of manufacturers representing an industry which produces a material largely used for its æsthetic qualities.

The campaign of the National Terra Cotta Society which opened in a recent issue of *The Literary Digest* offers a splendid example of how, through instructive educational publicity, the public can be interested in architecture—a subject which heretofore, unfortunately for the profession, has been a closed book to hundreds of thousands of building owners of the present and of the future.

The advertisement reproduced on the opposite page shows how a dramatic presentation of the Woolworth Building has been featured to win the reader's attention. Several paragraphs of the text are of sufficient interest to be quoted:

"When next you're downtown in New York, go out of your way to look again at the Woolworth Building. Look at it through new eyes!

"From that moment on you will make up your mind that when you look at buildings you will see Architecture.

"What is Architecture?

"It is Style. It is Design. It is Engineering. It is Mass and it is Detail. It is Proportion and it is Scale. It is Plan and it is Decoration. It is Ornament and it is Color.

"It is many things all co-ordinated by the master-mind of the architect."

Another striking feature of this unusual advertisement, from the architect's point of view, is what might be called the Brief Course in Architecture which is to be continued throughout the campaign. In each advertisement architectural details will be illustrated and described simply.

Selling to the Public the Business Value of Architectural Service
An Advertisement in *The Saturday Evening Post*

The benefit to be derived by the profession from this advertising is obvious. If the public can be taught to think of a building in terms of architecture—to ask the name of the architect rather than the name of the owner—then surely a great and larger future has been opened for the profession which will benefit public and architect alike.

Another campaign of equal interest is that of the Habirshaw Electric Cable Company. This concern has for several years devoted a major part of its advertising effort to establishing in the public mind the proper relation which should exist between building owner, architect and contractor. The advertisement reproduced is typical of this series.

Through such advertising a background of confidence is built up which enables the several factors participating in any important building operation to function in their best capacities.

Advertising developed in such ways will certainly influence a change in the policy of some manufacturers whose chief concern seems to have been to discredit the architect and to attempt to force the sale of their products to prospective building owners without recognizing the architect's professional function as adviser to his clients.

The possibility does not seem entirely remote that many architects whose attitude towards advertising has in the past been at best apathetic will be moved to consider seriously whether the force of honest, dignified advertising could not be applied to the profession of architecture with the purpose of establishing it on the most substantial basis.

Banker's Analysis Shows Active Period of Construction Coming

THE National City Bank, in its November review of business conditions, asserts that there is no good reason for believing that the country is entering a long period of depression. Referring to the great slump of commodity prices and the stagnation which has developed in some lines, this financial review says:

"Such experiences in the past have always followed long periods of internal development, including extensive construction work, such as railroad building, town building, etc. Our periods of prosperity and credit expansion have been of this character and it has usually happened that the movement has over-run the needs of the country at the time, and a period of growth was required afterward to bring the country up to its new facilities. This was the case in 1873 and 1893, the two most important crises of our recent history. In the period following 1893 recovery was delayed by controversy over the money question.

"The boom period which has been responsible for the existing expansion of credit and high prices was not due to internal development or construction work; on the contrary, it interfered with normal development and improvements and the facilities of the country are behind its needs. Never before was there so much work in sight needing to be done, or so many opportunities in the world outside. The immediate problem is that of price readjustment. It is not a case of exhaustion or of waiting to grow up to investments that have been made.

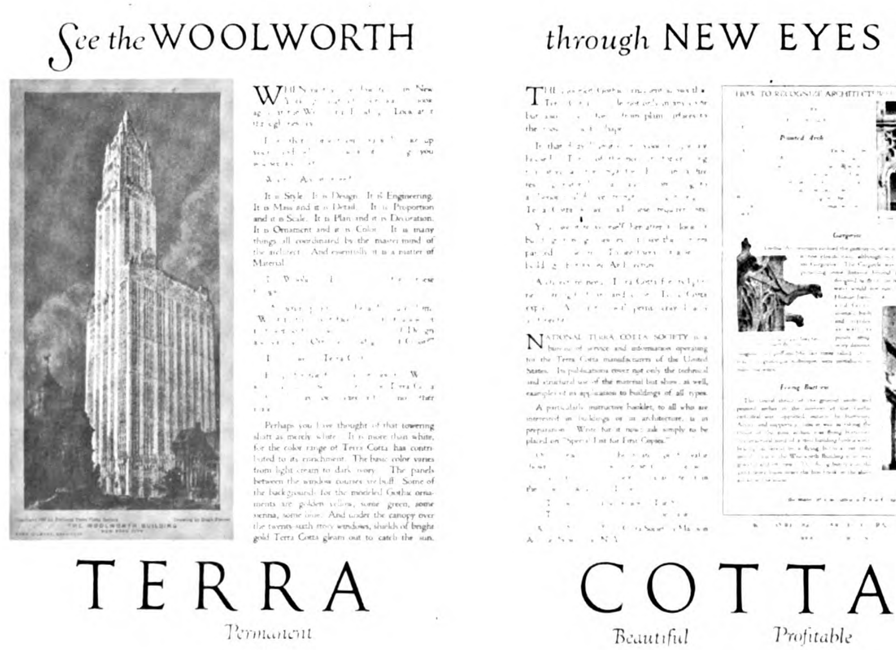
"The reserve resources and recuperative powers of the country are far greater than at any previous time when a check of this kind was experienced. The credit situation is wholly different, which in itself is a factor of great importance."

An additional viewpoint is given by the Dow Service Building Reports:

"It is conservative to assume that once the prospective building horizon is cleared the building construction public, or that part of it that can finance its own way without depending upon the aid of the recognized lending institutions, will rush into the market with new projects. By that time there will be more jokeless workmen; building material manufacturers will have had an opportunity to catch up with the backlog orders and non-deliveries and the cost of production of materials will have been drawn nearer to a normal basis.

"It must be remembered, however, that there is nowhere in the building industry a large surplus of building material supplies.

"Couple this condition of building material supply with a prospective stampede to anticipate the more or less experimental application of new laws as applied to construction in all its details, and at the same time bearing in mind the application of recent attempts to legislate for or against building construction, and it becomes apparent that building material prices have not yet come down to stay."



Developing a More Extensive Public Appreciation of Architecture
A Two-page Advertisement in *The Literary Digest*, Oct. 23, 1920

EDITORIAL COMMENT

WHAT SHOULD ARCHITECTS ADVISE REGARDING CONSTRUCTION?

THE professional capacity of the architect often requires him to take a position which is not advantageous to his pecuniary profit. This circumstance, which is so unusual in the business world, has probably never been so greatly in evidence as during the past year when the building industry was completely hemmed in by unfavorable conditions. The architect has been constantly asked his advice as to when to build and it is to the great credit of the profession that the average architect has displayed real professional qualities and has not encouraged clients to undertake building under uncertain conditions except in those cases, which have been numerous, where the estimate of immediate financial return from buildings has been sufficient to warrant the expenditure.

The profession in generally adopting this sane policy has undoubtedly deprived itself of many commissions, but it can take comfort in realizing that it has lived up to professional standards under conditions which presented great temptations and can rest assured that its action has greatly strengthened its position which will undoubtedly be borne out by future events.

The architect must exercise as well, however, a positive function; if it is unselfish service for him to advise against building, it is of equal service to anticipate future conditions as far as present facts permit, so that he may advise when the time for building will be favorable.

Cost of construction that may be high in comparison with figures that obtained before the war is not necessarily a detriment to building, but the lack of stabilization in every element entering into construction is a serious hindrance and this has been the primary difficulty. There is now, fortunately, evidence that this condition will be soon remedied.

Unquestionably the most disturbing factor has been the unreliability of labor. Excessive demand, during and immediately following the war, gave an opportunity for arbitrary wages and "loafing on the job" which resulted in a great decrease in efficiency. With the prospect of real deflation taking place and the certainty of wide unemployment if the present building inactivity continues, labor leaders have begun to see light. Building labor in Chicago has recently made an agreement to refrain from demanding higher wages for one year and has also agreed to arbitrate all jurisdictional disputes in order to eliminate the loss of valuable time.

From Baltimore comes the report that building trades workmen have declined an increase in wages which a previous trade agreement called for at this time. The rate for carpenters had been 90 cents an hour and on November first a rate of $1 an hour was to take effect. The result of further increases in wages was sufficiently obvious to them to make it appear desirable to abide by the existing wage.

These observations are indicative of a realization on the part of labor that construction costs must be stabilized and an increase in production brought about if a period of unemployment is to be averted. The labor unions, which during the last few years have ruled worker, employer and public with an iron hand, are now on the defensive, and unless they soon show a decided change in attitude they will go down in defeat. The present investigation into building practices in New York is bringing to light some instances of the use of the most revolting methods on the part of labor leaders in extorting large sums of money from builders and owners as protection against strikes that are called at the pleasure of the labor leaders and without a pretext of excuse.

It is undeniable that some form of collective action is necessary in the complex modern business world in order to insure fair and just treatment of workers, but it is equally certain that any system which permits dishonest leaders to use gullible workmen as a pawn to extort fortunes for their private gain will not be countenanced. Labor must rid itself of these vultures. The publicity these methods are receiving will be effective in eliminating many abuses and should aid materially in bringing about greater production and lower unit costs.

In view of all present indications architects should advise clients to make all preparations for beginning construction with the opening of the next building season. Labor costs will, in the next few months, be stabilized and the desire to have employment will guarantee efficiency.

The material market has already shown substantial reductions in price and most authorities are agreed that minimum prices have been reached. Other commodities may continue to show price reductions but the conditions that govern them and building materials are not analogous. There are no large stocks of building materials on hand and the indication is that manufacturers will close their plants before reducing prices further. Quotations of building materials have remained steady for a considerable time in spite of severe tests and it is now evident that present prices are very near basic costs, as the manufacturers claim.

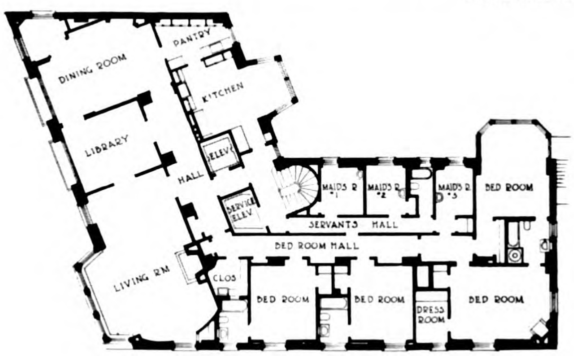
When arrangements can be made now for the delivery of material next spring it will be found advantageous. The large amount of construction which is expected to assume definite shape early next year will place a heavy tax on the material market. It must also be borne in mind that the program of road construction laid out this year has largely been deferred and this will necessitate a large consumption of the same materials that are used in building construction. The readjustment of the railroads, involving large amounts of new construction and equipment, will also constitute an important factor. It is unlikely, therefore, that lower prices can be expected in building materials; it is more likely that with a spirited demand and small stocks the price movement will be upward. Should this be true the extra cost of materials will be more than offset by the greater efficiency of labor.

GENERAL VIEW

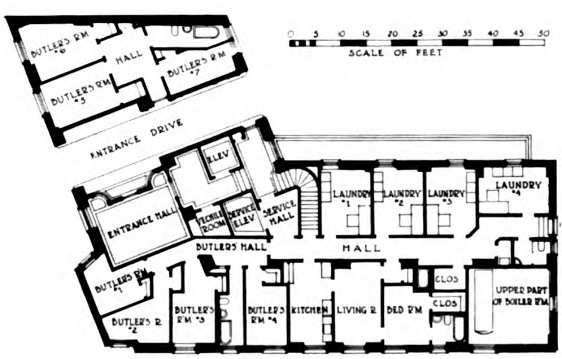
APARTMENT BUILDING, SHERIDAN ROAD, CHICAGO, ILL.

RICHARD E. SCHMIDT, GARDEN & MARTIN, ARCHITECTS

PUBLIC ENTRANCE HALL



TYPICAL FLOOR PLAN

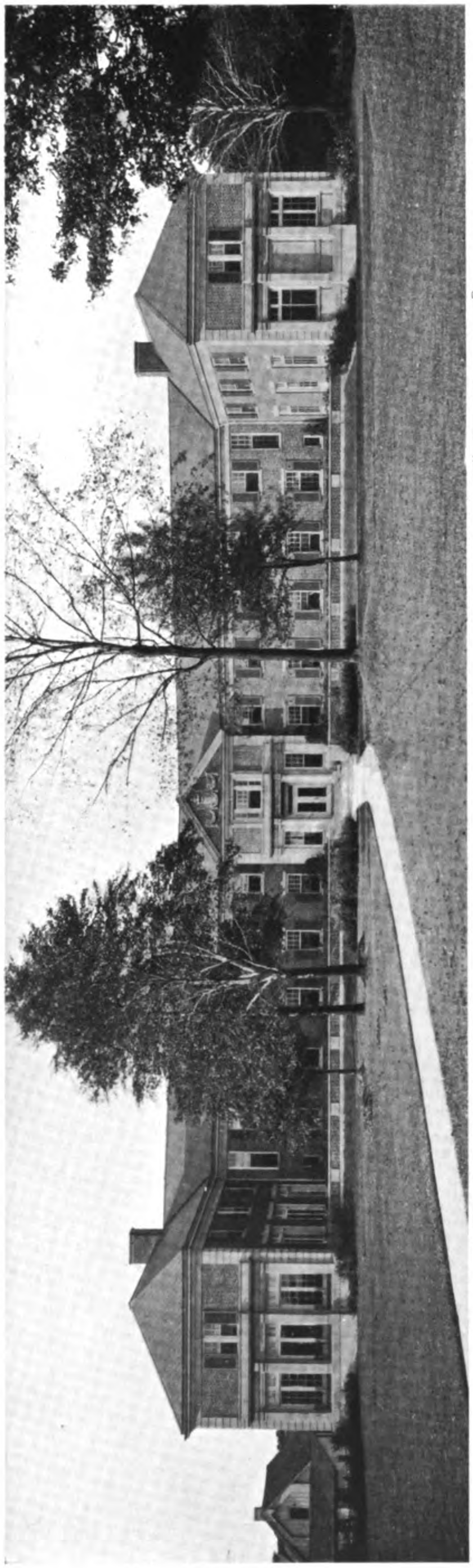


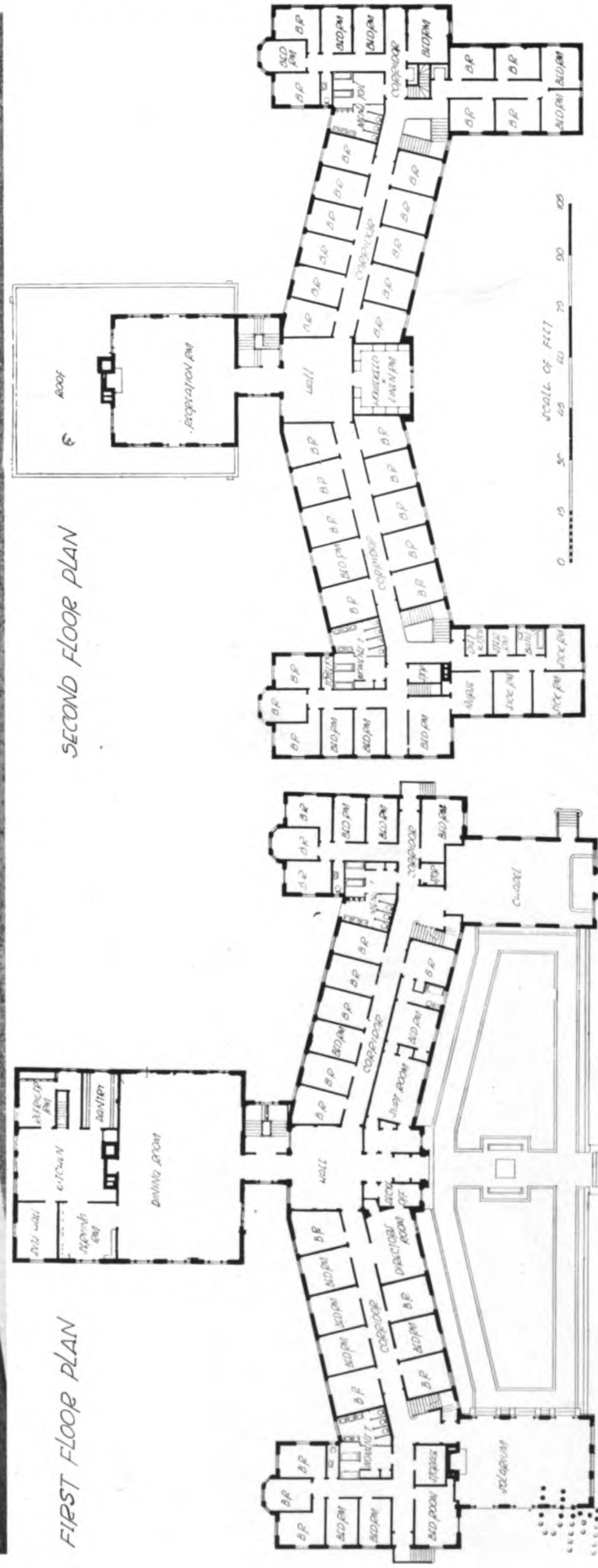
FIRST FLOOR PLAN

MAIN ENTRANCE DETAIL

APARTMENT BUILDING, SHERIDAN ROAD, CHICAGO, ILL.

RICHARD E. SCHMIDT, GARDEN & MARTIN, ARCHITECTS

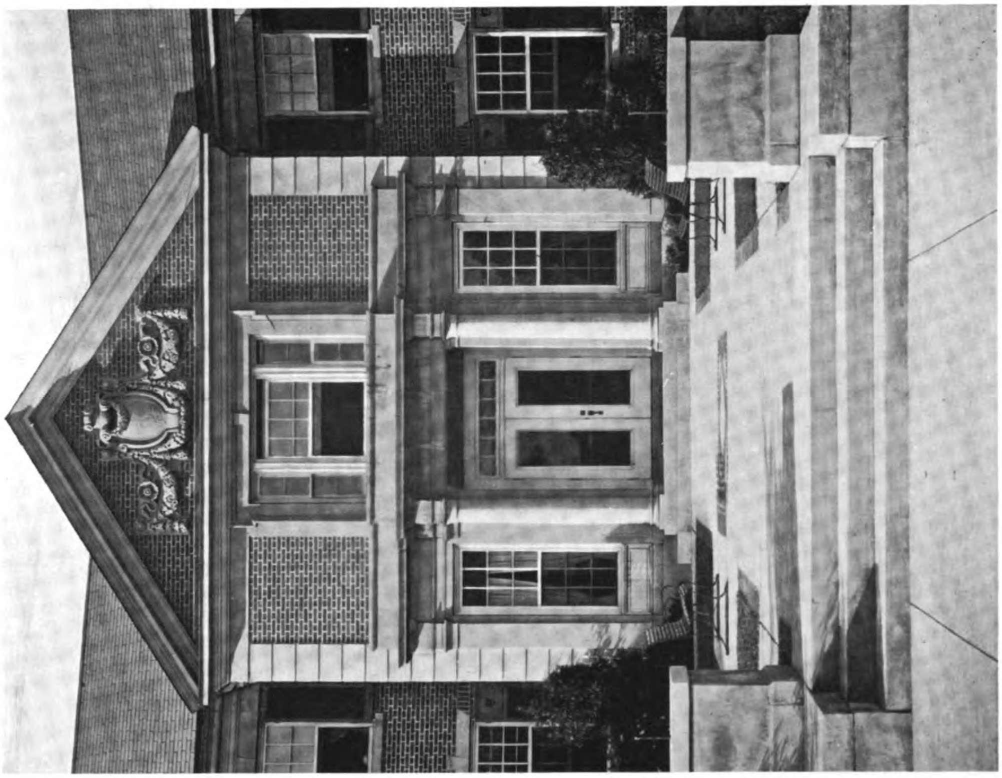




GENERAL VIEW AND FLOOR PLANS

MONTEFIORE HOME, CLEVELAND HEIGHTS, OHIO

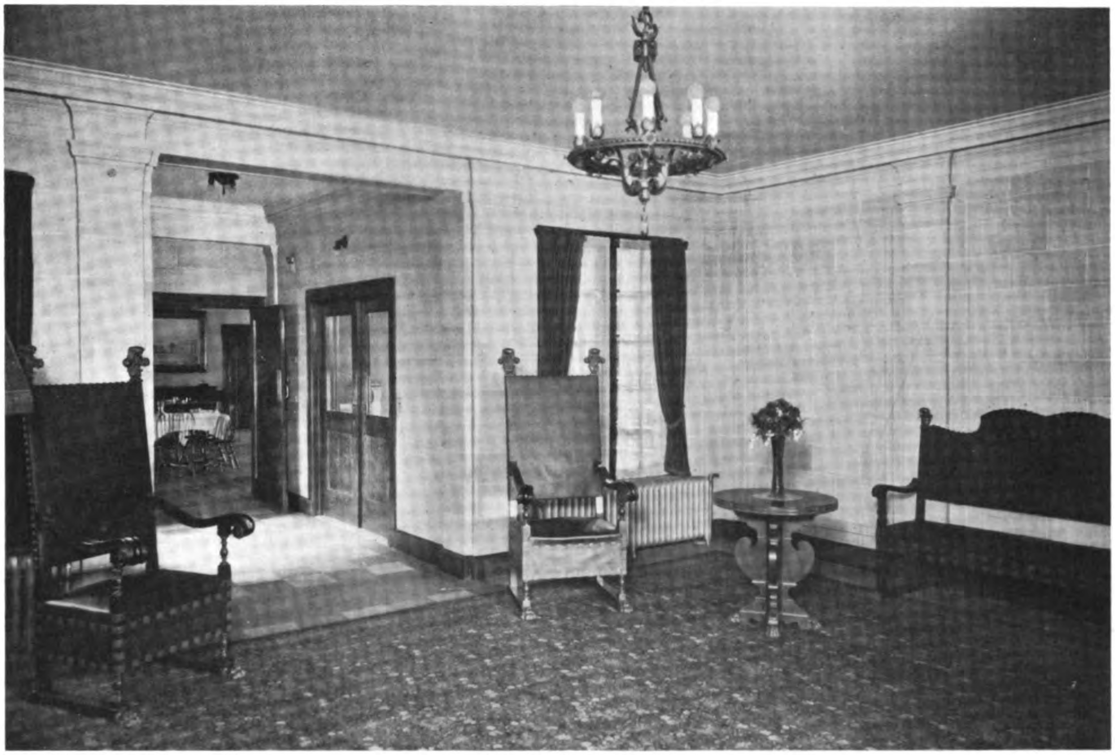
CHARLES R. GRECO, ARCHITECT



CHAPEL WING AND MAIN ENTRANCE

MONTEFIORE HOME, CLEVELAND HEIGHTS, OHIO

CHARLES R. GRECO, ARCHITECT

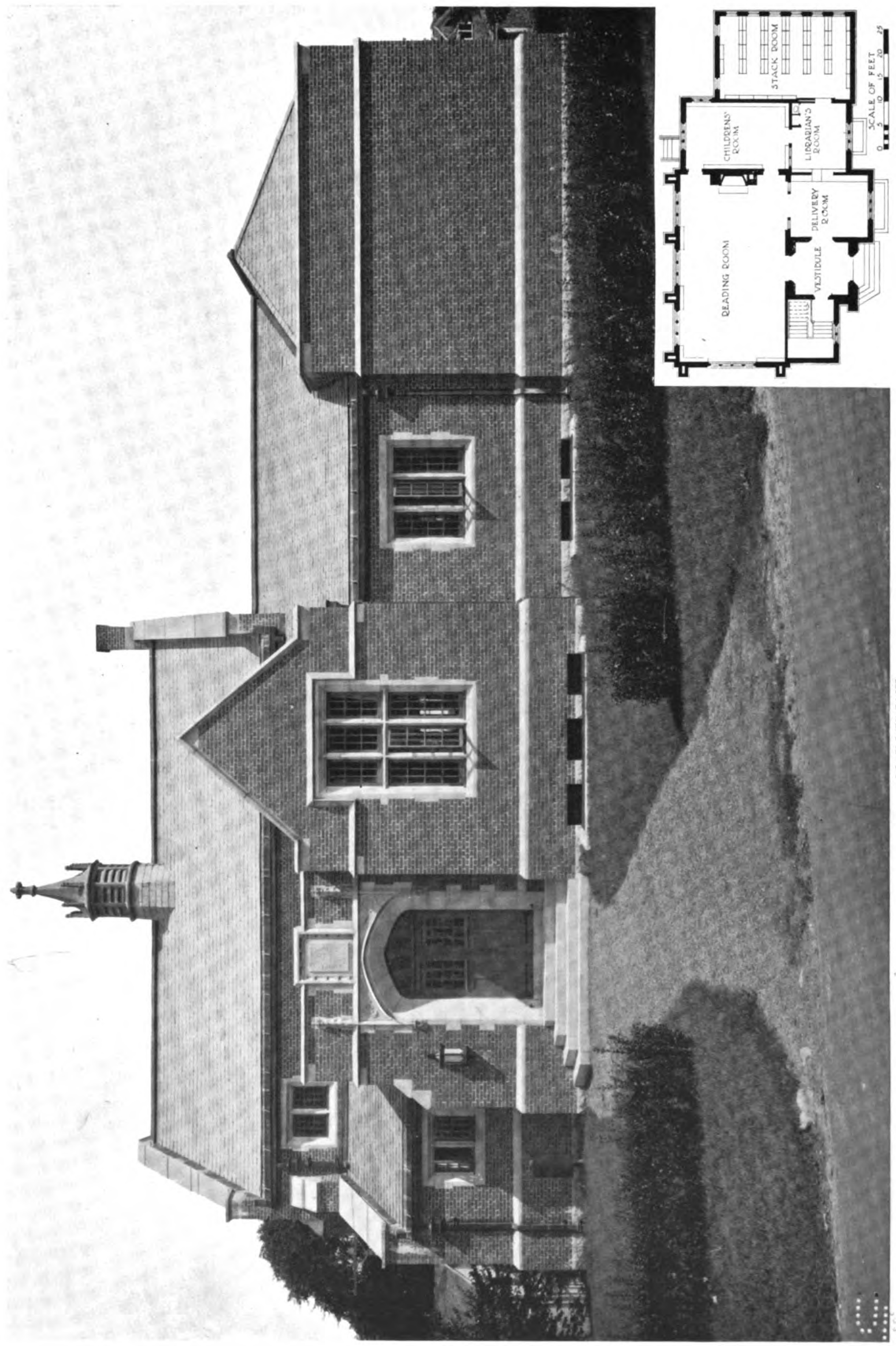


ENTRANCE HALL

VIEW IN SOLARIUM

MONTEFIORE HOME, CLEVELAND HEIGHTS, OHIO

CHARLES R. GRECO, ARCHITECT



MAIN FRONT

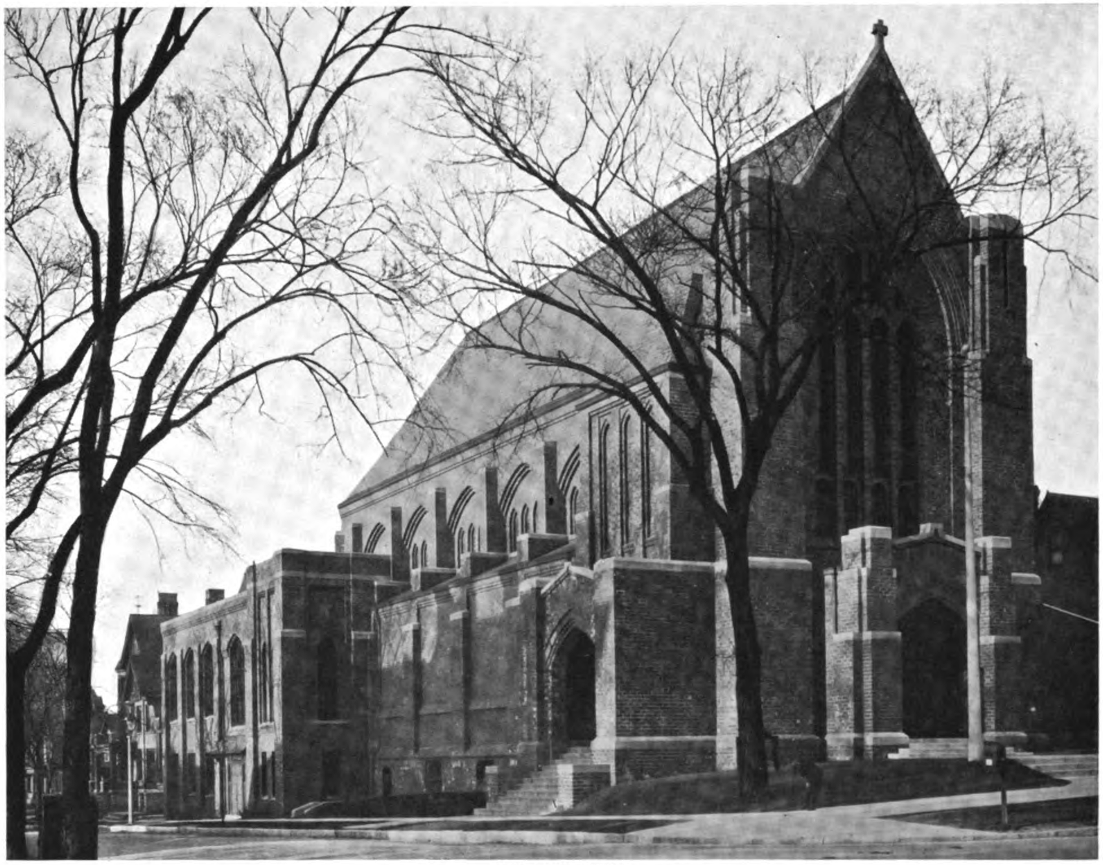
TOBEY MEMORIAL LIBRARY, WAREHAM, MASS.

E. M. PARSONS & CO., ARCHITECTS

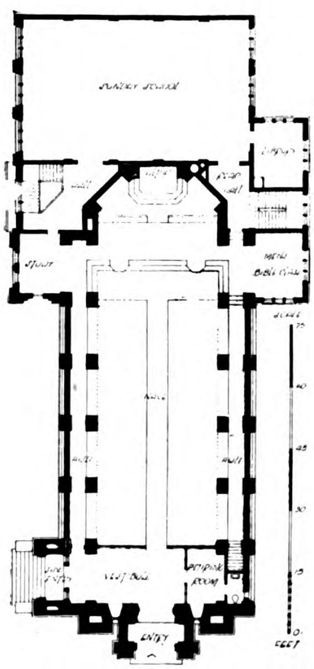
DETAILS OF READING ROOM

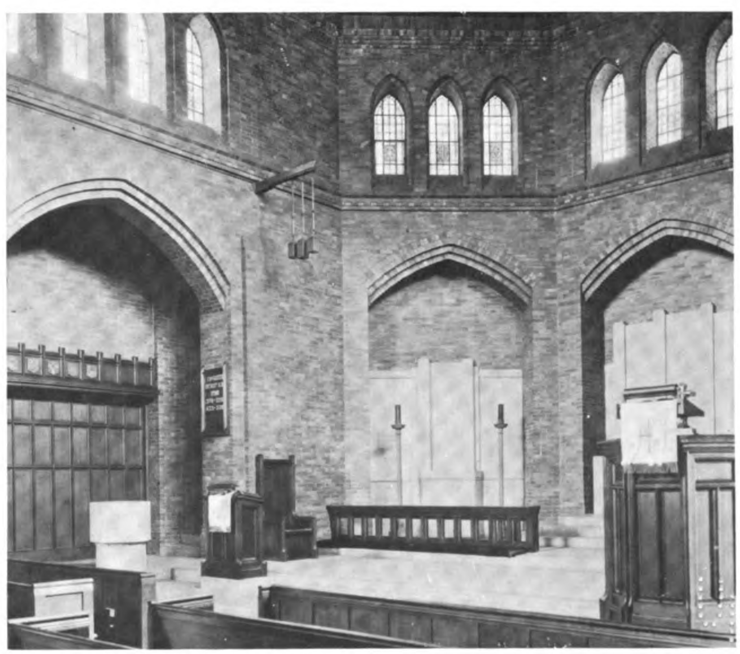
TOBEY MEMORIAL LIBRARY, WAREHAM, MASS.

E. M. PARSONS & CO., ARCHITECTS



GENERAL VIEW





MAIN FLOOR PLAN AND DETAIL OF CHANCEL

CHURCH OF THE REDEEMER, MILWAUKEE, WIS.

SCHUCHARDT & JUDELL, ARCHITECTS

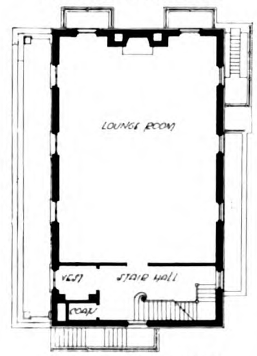
MAIN FRONT

BUILDING FOR THE PEABODY COLLECTION, PHILLIPS ACADEMY, ANDOVER, MASS.

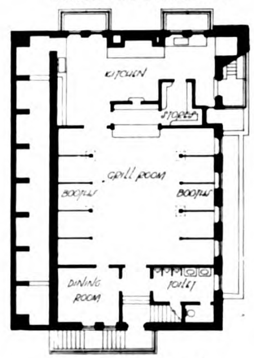
GUY LOWELL, ARCHITECT

STAIR HALL

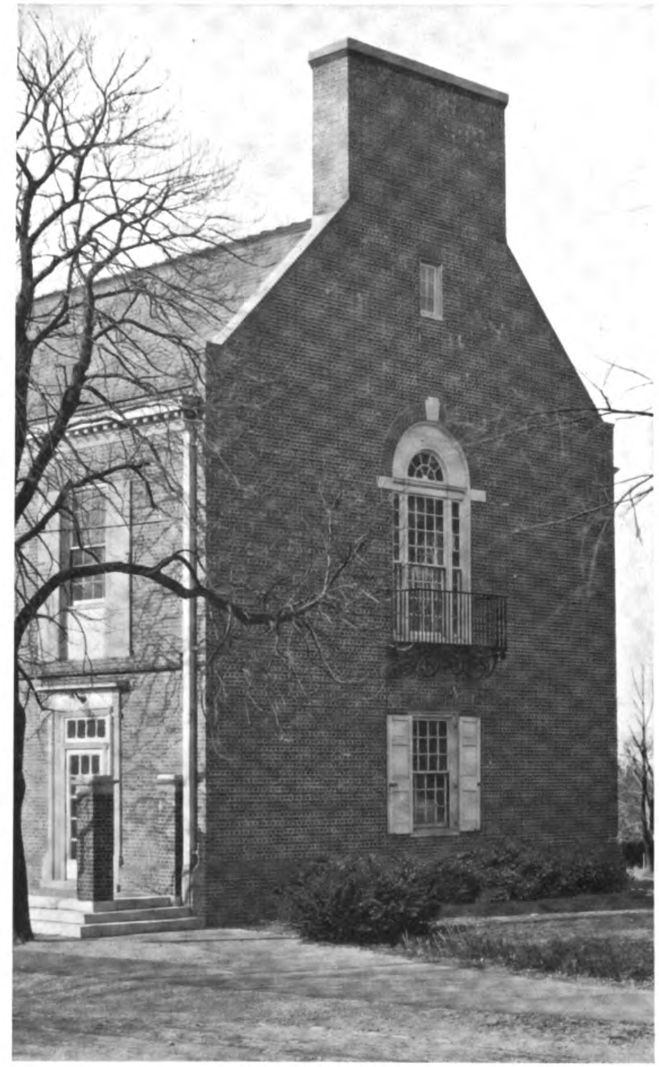
SECOND FLOOR PLAN



FIRST FLOOR PLAN



BASEMENT PLAN

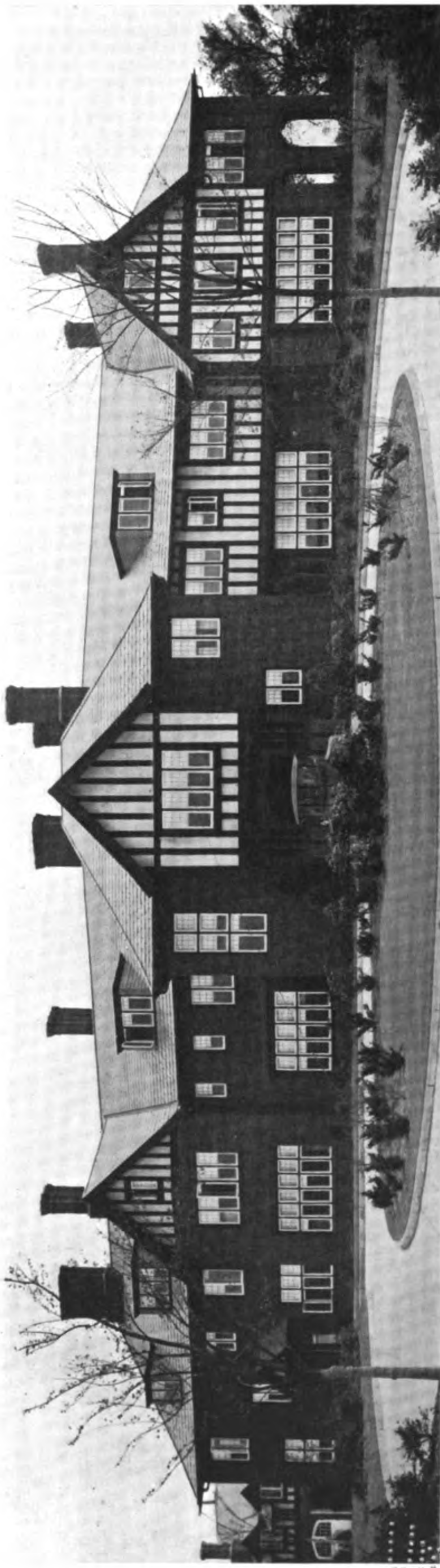


END DETAIL

BUILDING FOR THE PEABODY COLLECTION, PHILLIPS ACADEMY, ANDOVER, MASS.

GUY LOWELL, ARCHITECT

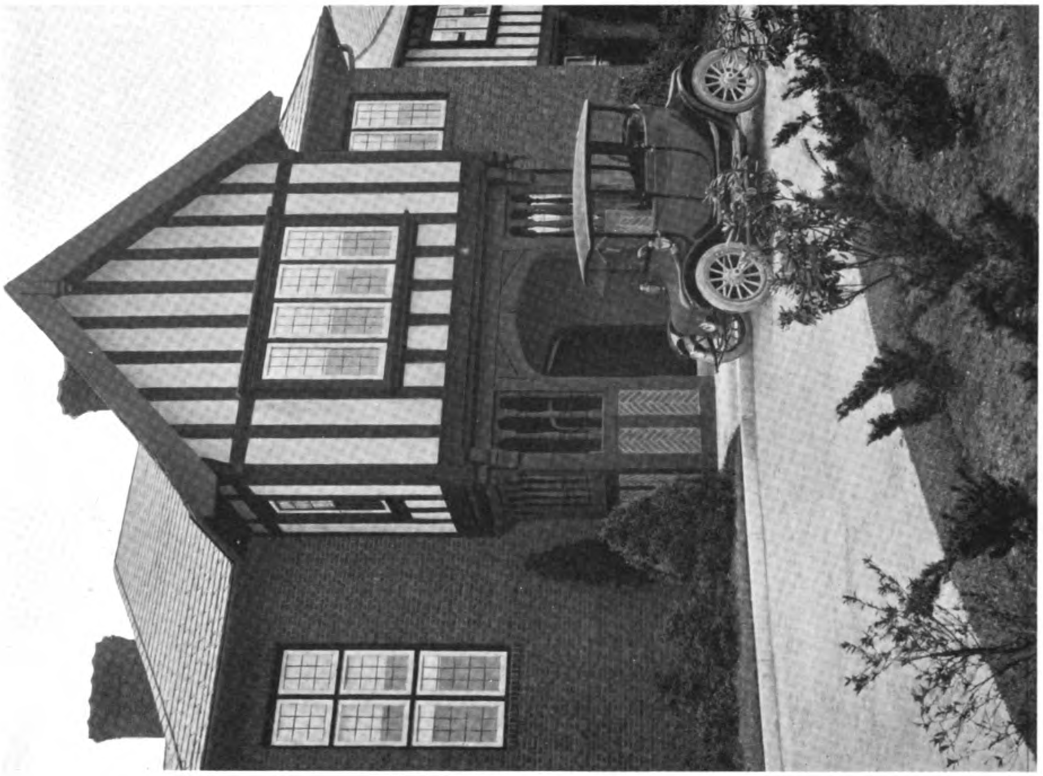
GARDEN FRONT



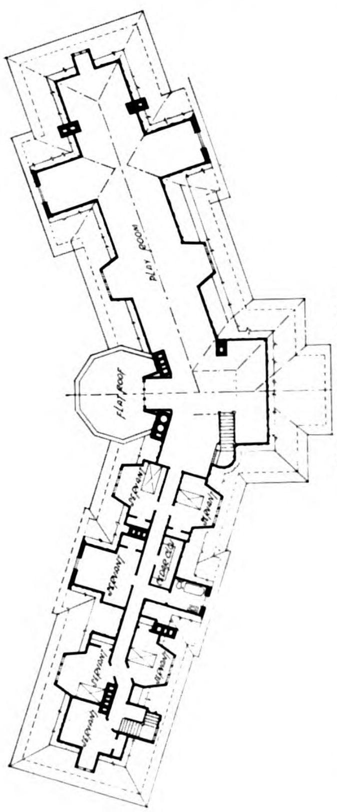
ENTRANCE FRONT

COUNTRY HOUSE AT COLUMBUS, OHIO

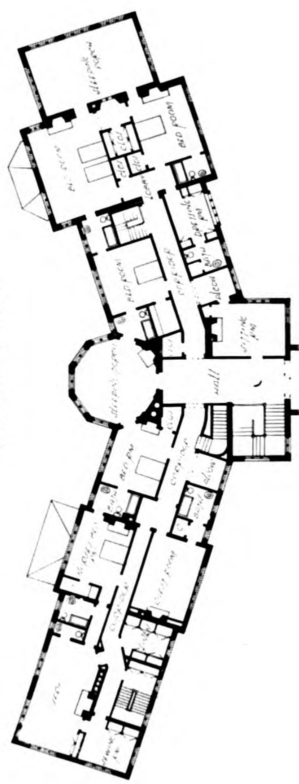
RICHARDS, McCARTY & BULFORD, ARCHITECTS



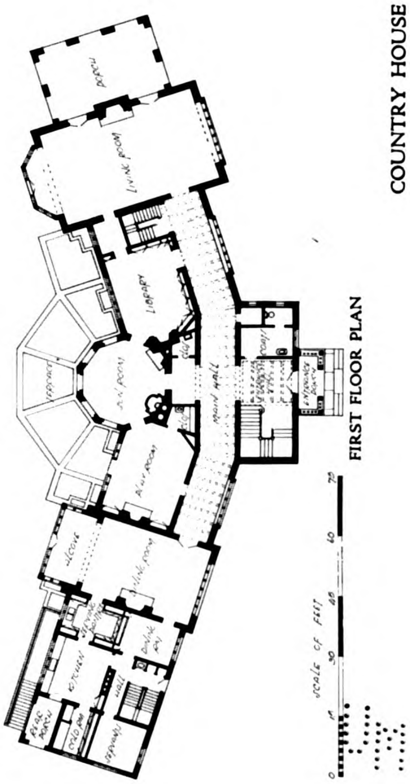
DETAIL OF ENTRANCE PORCH



THIRD FLOOR PLAN



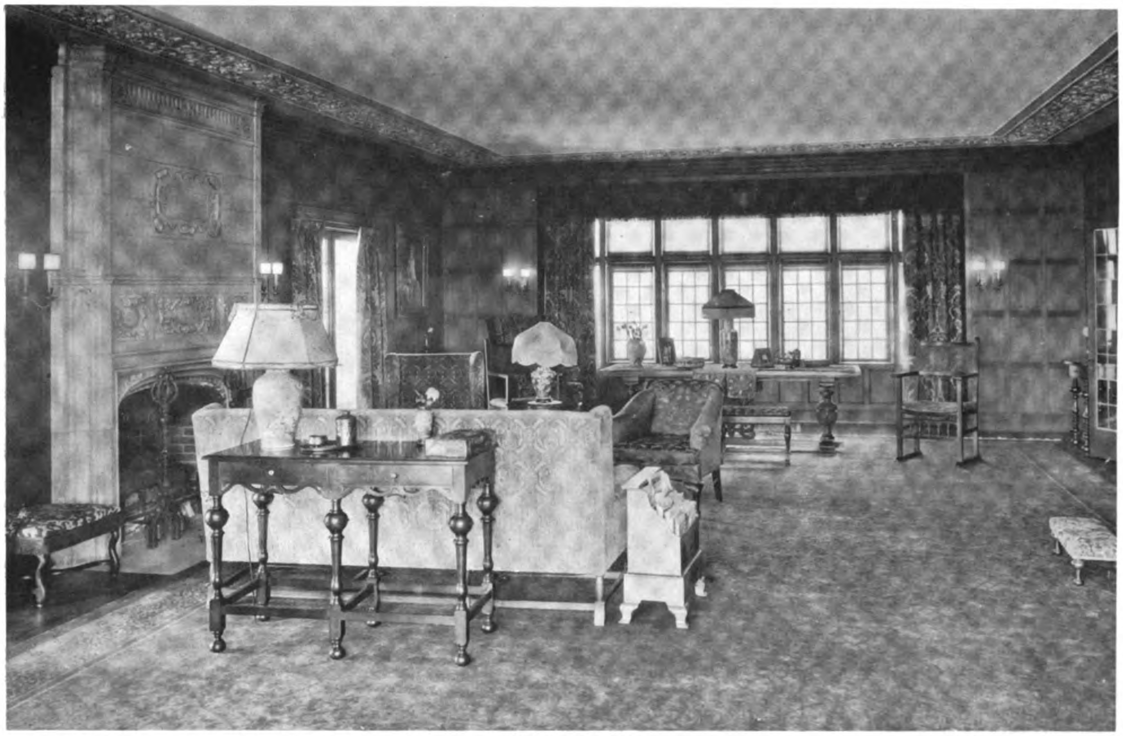
SECOND FLOOR PLAN



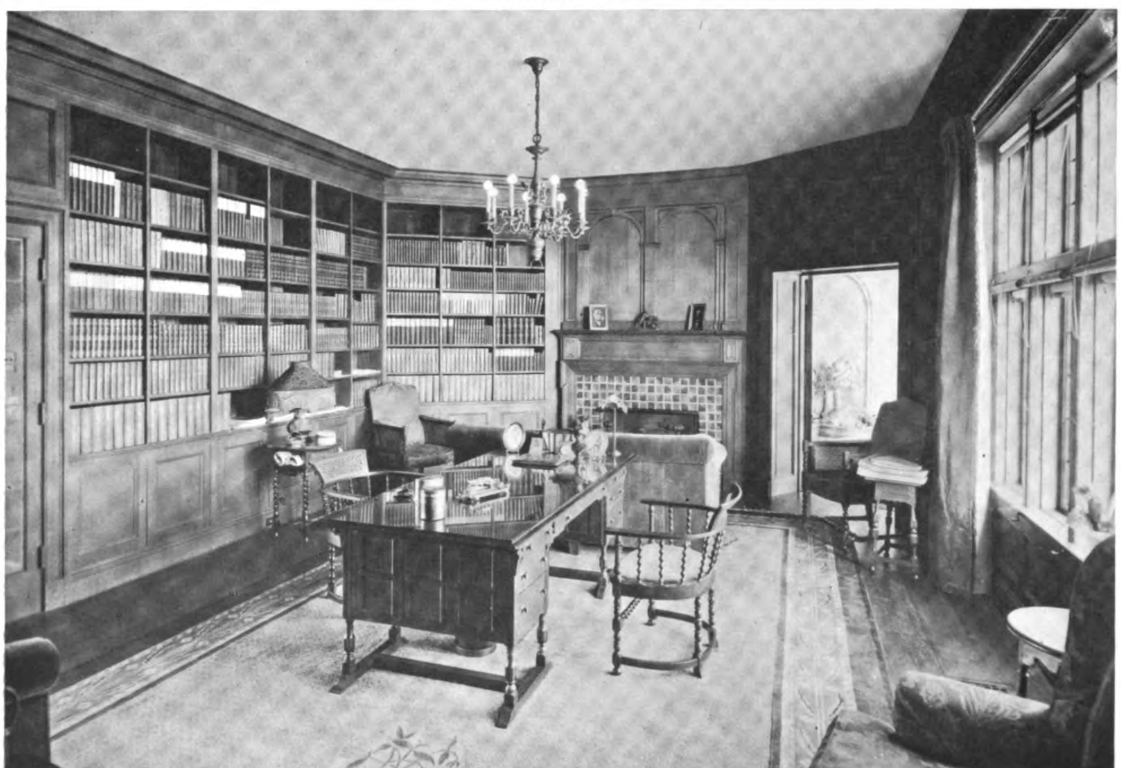
FIRST FLOOR PLAN

COUNTRY HOUSE AT COLUMBUS, OHIO

RICHARDS, McCARTY & BULFORD, ARCHITECTS



LIVING ROOM



LIBRARY

COUNTRY HOUSE AT COLUMBUS, OHIO

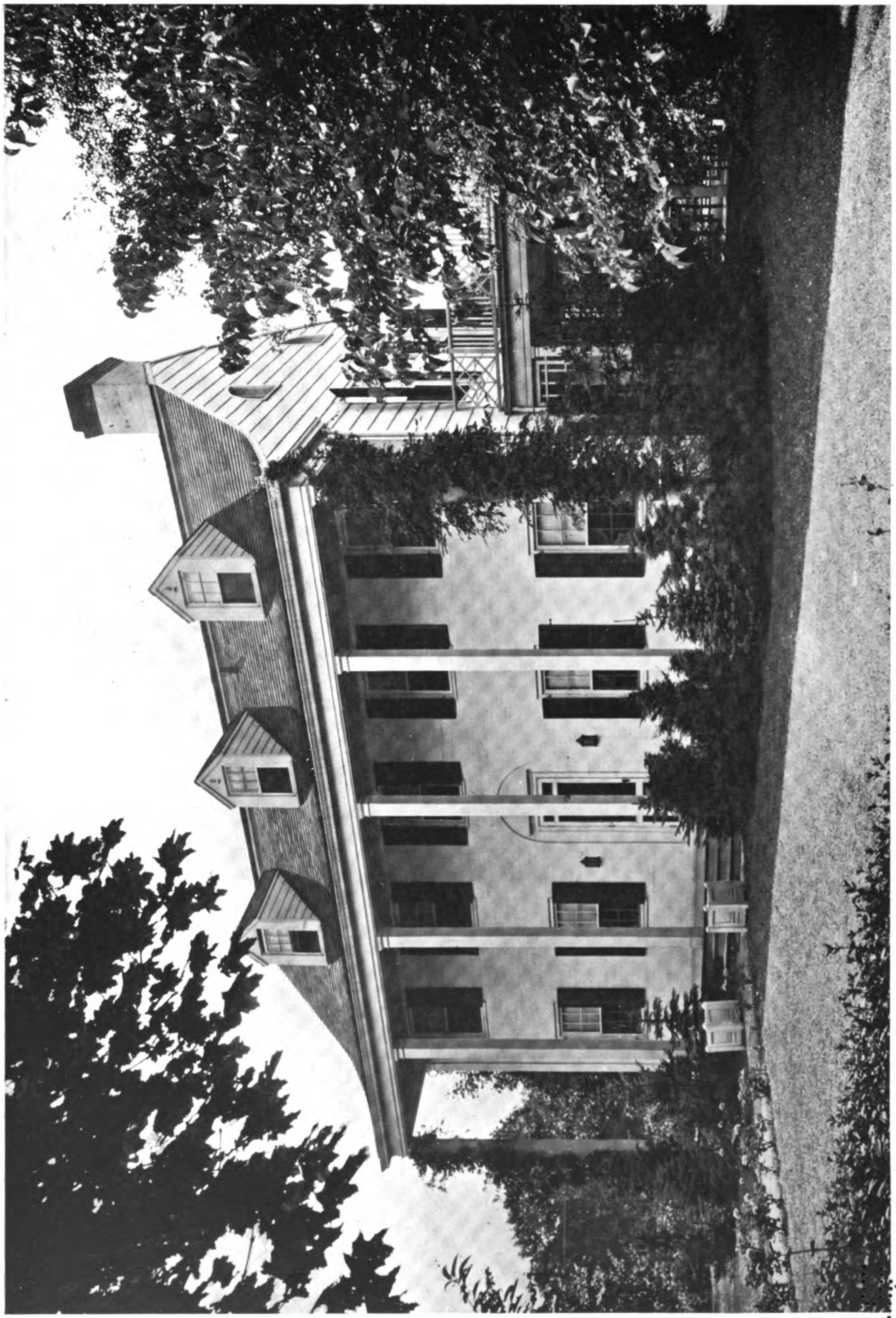
RICHARDS, McCARTY & BULFORD, ARCHITECTS

SUN ROOM

MAIN HALL

COUNTRY HOUSE AT COLUMBUS, OHIO

RICHARDS, McCARTY & BULFORD, ARCHITECTS

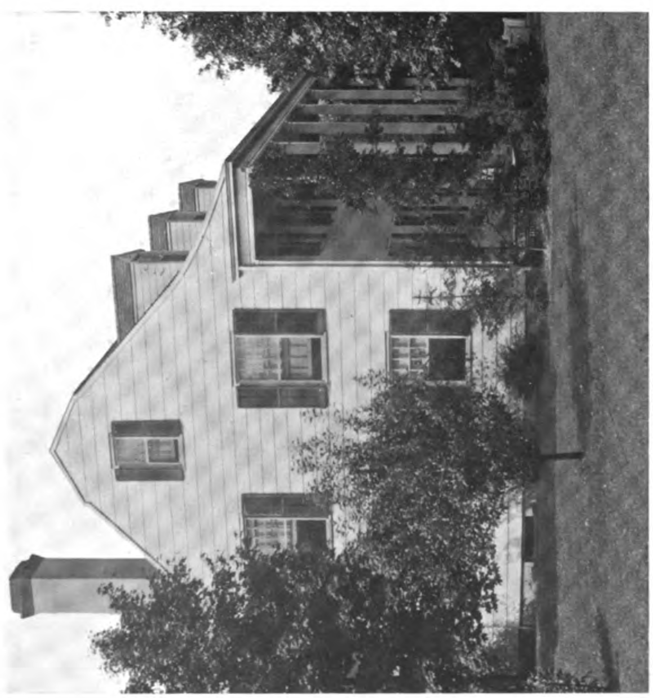


GENERAL VIEW

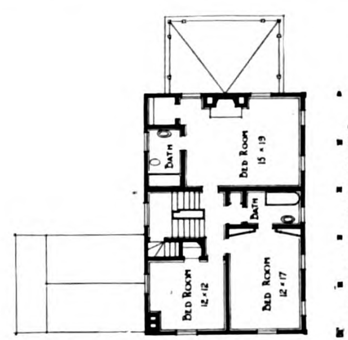
HOUSE OF RAYMOND S. CLARK, ESQ., GREAT NECK, LONG ISLAND, N. Y.

ALFRED HOPKINS, ARCHITECT

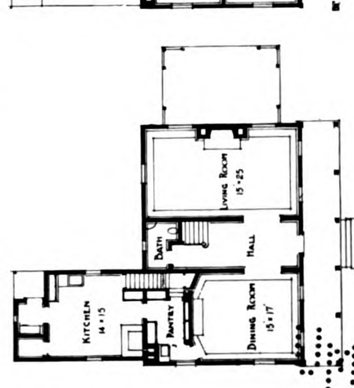
VIEW OF GARDEN SIDE



CORNER OF SERVICE SIDE



SECOND FLOOR PLAN



FIRST FLOOR PLAN

HOUSE OF RAYMOND S. CLARK, ESQ., GREAT NECK, LONG ISLAND, N. Y.

ALFRED HOPKINS, ARCHITECT

THE ARCHITECTURAL FORUM

DECEMBER 1920

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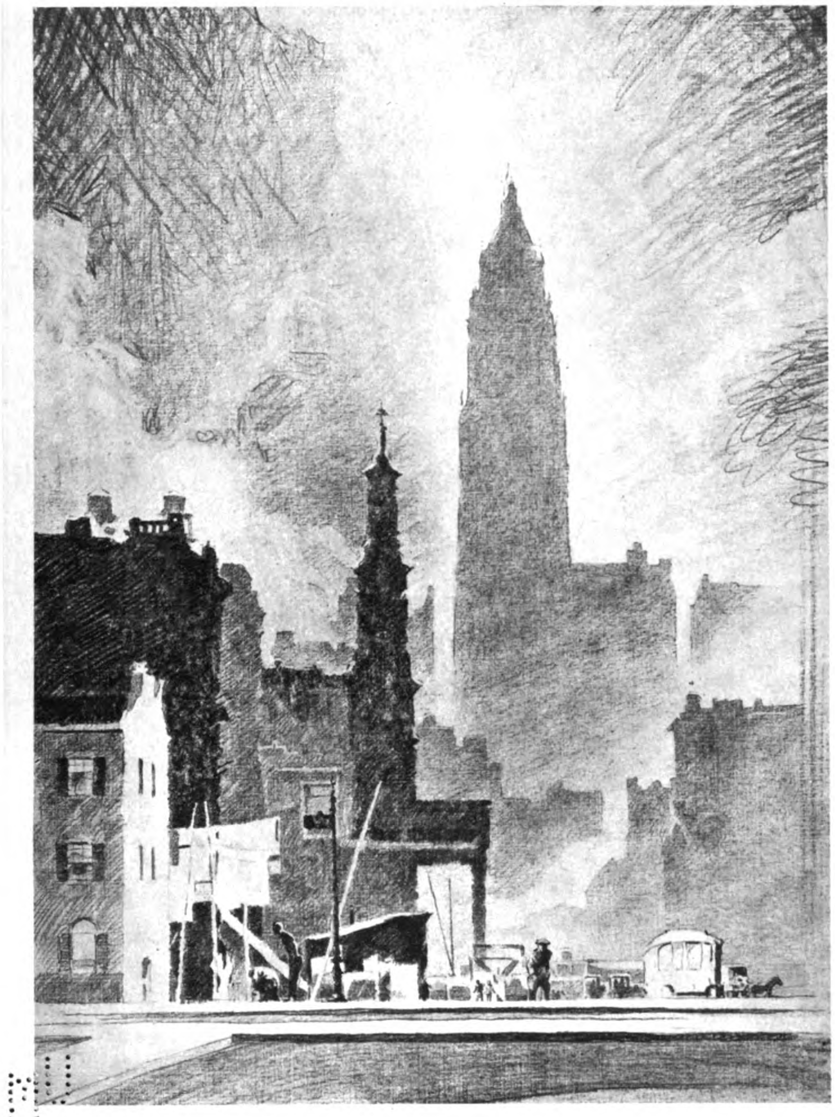


WOOLWORTH TOWER AND ST. JOHN'S CHAPEL,
VARICK STREET, NEW YORK CITY

From Pencil Drawing by Harold R. Shurtleff

The ARCHITECTURAL FORUM

VOLUME XXXIII | DECEMBER 1920 | NUMBER 6

The Decorative Function of the Stone Pavement

By HAROLD DONALDSON EBERLEIN

THE art of imparting decorative interest to stone pavements has been successfully practiced under manifold forms for thousands of years. Through the centuries it has been recognized as entitled to play a part in the architect's scheme, and has been counted upon to contribute a specific and essential value in the entirety of the composition, a value not attainable by any other means. It has been freely employed with striking effect both within buildings and in the open, and its manifestations have been marvelously varied and not confined to use with any one mode of architectural expression.

It was left, however, for the mid-nineteenth century, with its sorry worship of merely mechanical production, to allow this rich and time honored art either to lapse into oblivion or else to fall into a plight of such stupid banality that its claims to serious consideration as a valuable accessory to architecture have been almost totally discredited.

It is quite true that of recent years, in the designing of public buildings, an increasing degree of attention has been paid the claims of the stone pavement as a decorative factor. But, unfortunately, the heritage of nineteenth century purblindness is still too potent for us to cast off altogether its blighting spell and most of us but dimly grasp the paving glories of the past—glories that we can again emulate and make fully ours if we will.

As the art of mosaic paving has been more generally understood and more continuously practiced than other modes of stone flooring, even during the period of nineteenth century dullness, attention will here be centered rather upon several less familiar types of embellishment for stone pavements, especially one method of inlay that was used from the twelfth, or possibly the eleventh, to the sixteenth century, and another that developed to its greatest perfection from the latter part of the sixteenth century to the early part of the eighteenth. In considering all these forms of paving enrichment it should be borne in mind that they are not, through any inherent qualities, restricted to use in large or public buildings. They may be laid with quite as much propriety in private houses of average size, if one wishes to have them. So far as fitness is concerned, the only factors to be considered are the particular sort of decorated paving to be chosen, and the design, this being held to include both pattern and color.

The various sorts of decorated stone paving, technically classified, are these:

(1) *Opus tessellatum*, consisting of small marble or stone cubes or *tesseræ* about ¾ inch square, sawn or worked by hand to a proper shape and regularly disposed in simple geometrical patterns; the same *tesseræ* were likewise used in other sorts of mosaic, but the pavement was not called *tessellatum* unless the component units were exclusively of this square shape;

(2) *Opus vermiculatum*, consisting of *tesseræ* of irregular shapes and sizes, varying from ½ inch to 1/20 inch, the pieces being individually adapted to their positions so as to follow the lines of the design, which was usually of a pictorial character; in the background, or in large masses of even coloring, these divisions caused an appearance like a mass of worms, hence the name;

(3) *Opus sectile*, so called from the *secta* or separate units, cut out from colored marbles or stone, and really a species of stone marquetry devised to produce both pattern and color;

(4) *Opus Alexandrinum*, a special variety or subdivision of *opus sectile*, in which the units were cut into triangles, squares, oblongs, rhomboids, hexagons and the like, and so combined as to compose regular geometrical patterns—geometrical *opus sectile*, in other words.

Of the foregoing modes, *opus tessellatum* and *opus vermiculatum* both fall in the category of "mosaic pavement" as we commonly understand that term. Whence the Greeks derived their first inspiration for this manner of flooring is a disputed point. At all events, the Romans learned it from the Greeks and elaborated it to the highest stage of perfection.

In the form to which the Romans advanced it, it has supplied the point of departure whence all subsequent phases of decorated stone paving have branched off. The technical processes involved are given by Vitruvius and Vasari, and may easily be found elsewhere, so that there is no need to dwell upon them here.

Opus sectile made its appearance at an early date and ultimately reached several totally divers forms of development. One of these, *opus Alexandrinum*, common throughout Italy and the East, and occurring to some extent elsewhere also, reached its highest perfection in the thirteenth century. It consists in part of small marble *tesseræ*, which often compose the main lines of the pattern and in part of large pieces of stone or colored marble used as a ground or matrix. It is frequently designed in large flowing bands which interlace and enclose circles of varied sizes. The circles of colored stone so enclosed are sometimes cross sections sliced from a column. In conjunction with the interlacing circle motifs are often to be found oblongs, hexagons or roundels, defined by bands of white marble and filled with a diaper pattern composed of small, geometrically shaped pieces of vari-colored stones or marbles. The materials chiefly used for this paving were white marble, with green and red porphyry, while occasionally minute pieces of gold glass were introduced by way of additional enrichment. Instead of small white marble *tesseræ*, larger pieces of white marble were often used to form the interlacing bands. Paving of this type is sometimes styled "cosmatic," but the term "cosmatic work" is, perhaps, more applicable to a very similar sort of decoration with smaller details on a vertical surface.

Fig. 1. The Emperor Sigismund, Cathedral of Siena

Santa Maria in Cosmedin (Fig. 2) and San Clemente in Rome afford admirable examples of such decorated paving as has just been described, while in England worthy specimens are to be seen in Westminster Abbey in the Chapel of Edward the Confessor and in the sacrarium before the high altar, laid about 1268 by one Odericus, a Roman artist brought by Abbot Ware on his return from a visit to Rome. *Opus Alexandrinum* attained its most elaborate, and in some respects most effective, expression in the paving of San Marco in Venice, where not only the usual methods were used but where also, in many places,

Fig. 2. *Opus Alexandrinum,* Floor of Santa Maria in Cosmedin, Rome

a wider range of materials was employed, with a greater diversity of patterns, and where a certain appearance of incipient perspective was sometimes compassed through the use of shaded marbles.

However engaging may be the study of *opus Alexandrinum* and the two phases of mosaic already alluded to, there are two sorts of *opus sectile* quite apart from *opus Alexandrinum* that just now more claim our attention because they are less known or, at any rate, have hitherto had less consideration. One made its appearance at the beginning of the thirteenth century,—or possibly in the latter part of the twelfth,—was employed with great effect in Italy and France, reached its full development in the ensuing centuries and maintained its ascendency in unabated vigor until the end of the fifteenth century when it achieved its most notable triumph and embodiment, as a highly organized and complex mode of decorative paving, in the Cathedral of Siena. The other phase of *opus sectile*, after an obscure preliminary period of evolution, blossomed forth in the sixteenth century, was employed with brilliant results by the great baroque masters of the sixteenth and seventeenth centuries, and continued to hold its own until well into the eighteenth.

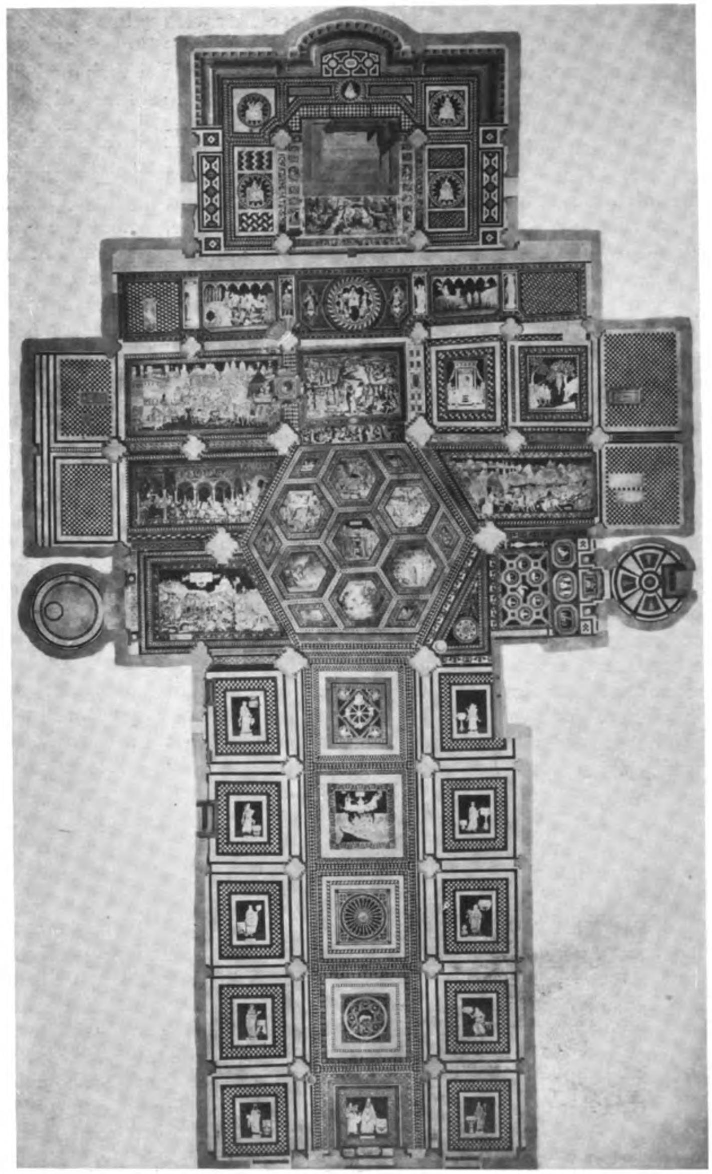


Fig. 3. Complete Scheme of Paving in Cathedral of Siena

Of the first mentioned phase of *opus sectile*, admirable early examples exist in both Italy and France. In Italy, not to cite more numerous instances, we may point to the floor of the Baptistery in Florence and to the floor of San Miniato. Both of these plainly exhibit the methods of ingenious cunning pursued by the craftsmen and the wealth of decorative enrichment that could be thus accomplished. The materials were few and readily attainable, and the technical processes comparatively simple; the success of the result depended wholly upon the manual skill and the fruitful invention of the artist. In France, among other remarkable specimens of this type of paving, the floor in the Cathedral of St. Omer may be counted as one of the best.

To lay this pavement the cement bed was prepared in the manner noted by Vasari and then the pieces of marble or stone were carefully set according to the pattern. Close examination of Fig. 7 will show, first, that a great number of small, diversely shaped pieces of stone and marble have been set in the cement, each piece separately cut and laid to form the sundry diaper patterns; second, that the broad dividing bands, with quatrefoil and lozenge repeats, are made from single large slabs or flags of marble, with the ground incised and then inlaid or encrusted with a substance of contrasting color to throw the pattern into relief.

In the latter instance the process was as follows: the pattern was traced or outlined upon the surface of the marble, then all the surfaces to be sunk—that is to say, all the portions not intended to form part of the white pattern—were lowered either with a chisel or with a trepanning drill, according to the extent and nature of the sinkage. The cavities were then filled up flush with the top surface, either with lead or else with black or colored mastic or hard-setting stucco, and the whole dressed to an even surface. In some cases, where the sinkages were extensive enough or of convenient shape, they might be filled with an inlay of contrasting colored stone or marble. This latter operation, however, required the nicest cutting and adjustment and was not, as a rule, expedient nor, on an extended scale, would it have been practicable.

The working of the aforementioned processes is even more clearly shown, in some respects, in Fig. 8. In this bit of the San Miniato paving the dividing lines are strips of dark marble, while each of the white flags, conformably to a favorite usage of the time, contains a graven design complete in itself. In the Italian work either lead or black mastic was commonly used to fill the sinkages. Sometimes both were used interchangeably, as in the pavement of Santa Maria dei Miracoli in Venice. In the contemporary French work there was greater variety in the color of the mastic or stucco filling—black, red, brown, dark green and both light and dark blue. This diversity in mastic coloring was probably, in some measure, due to the comparative difficulty in obtaining the vari-colored stones and marbles which the Italian workmen had in plenty.

The gravings or sinkages in the marble slabs varied from mere line incisions to comparatively broad expanses. The fill of lead or mastic, as the case might be, was then fixed. For a narrow line a V shaped incision sufficed, with the chisel or drill marks left rough, so that the fill might key to the marble. For a broad line or other space, if the fill was mastic, the sinkage had vertical sides or edges, , and the sunk surface was left rough. If the fill was lead, the marble was undercut, thus , to hold the metal firmly in place as the chisel or drill marks in the sinkage did not afford a sufficient key.

In the French work of the period two or more colored mastics were often used in conjunction. Thus, one of the engraved stones at St. Omer, which displays a knight on horseback with his shield, his spear and pennon, and an inscription surrounding the floriated background, shows a brown ground and brown-filled lettering, while the lines of the knight's figure, of the horse, and of the heraldic charges are red. The inscriptions on this and other stones indicate that each stone was the gift of an individual, and that the paving was provided in this way. In some of the paving laid at St. Denis, the mastics are black, red, dark green, gray-blue and brown within a limited compass. At Amiens also there is considerable variety of color. While the French generally preferred to confine one complete design to a single slab or flag, the ensemble produced when all these units were put together was mellow in color and rich in pattern.

As a masterpiece of cunning craftsmanship in

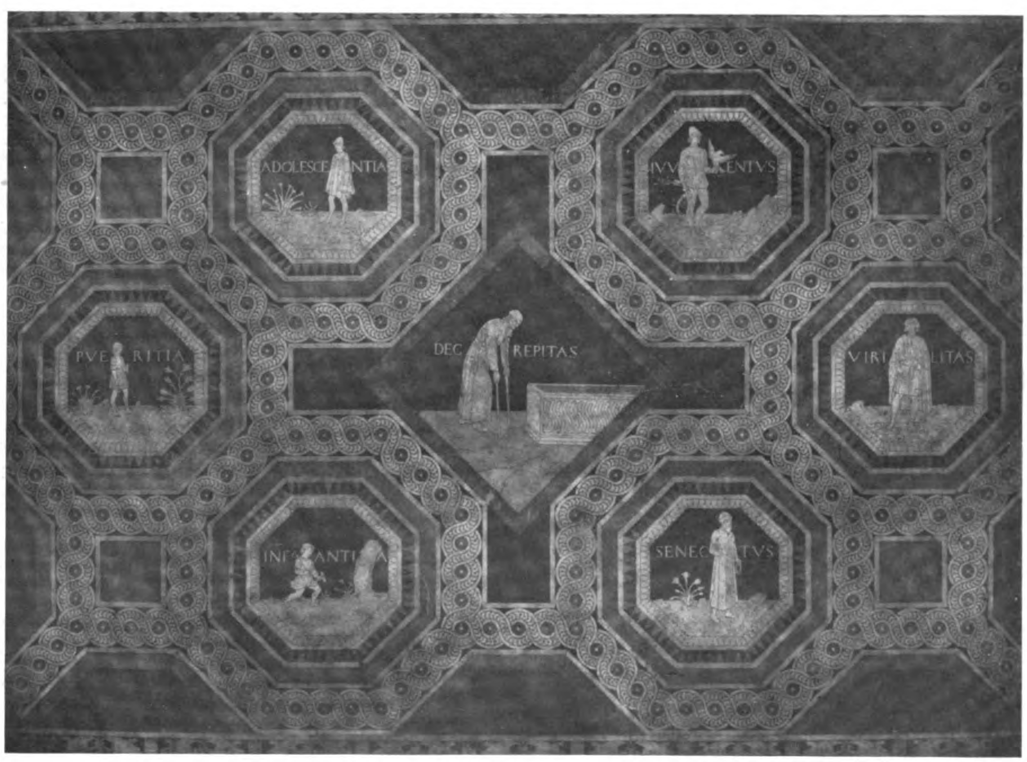


Fig. 4. "The Seven Ages of Man" Wrought by Antonio Federighi, 1475, Cathedral of Siena

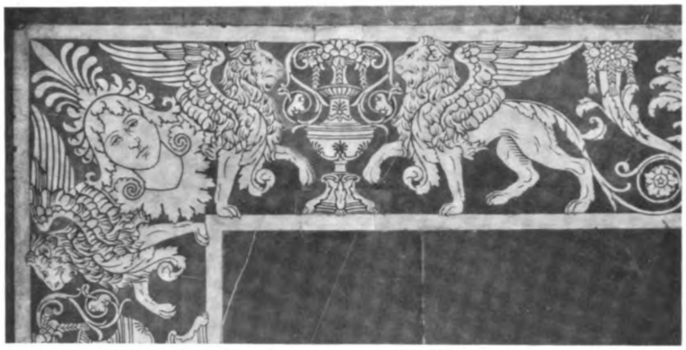


Fig. 5. Engraved Border by Bastiano di Francesco, Cathedral of Siena

ception. Nevertheless, the pavement exhibits a remarkable unity of purpose and decorative aspect.

The entire cathedral floor is divided into sections that correspond more or less exactly with the architectural subdivisions of the building (Fig. 3). The floor area in the five bays of the nave, for example, is divided into five corresponding equal spaces, each of which contains a major motif set within its appropriate border. In like manner the corresponding spaces in the aisles are given over to depicting the ten sibyls, five in the north aisle and five in the south. The hexagonal space underneath the dome is subdivided into seven hexagons and six lozenges, each containing a separate subject enclosed in its own border (Fig. 6). So likewise have the transepts, the choir, the sacrarium and the ambulatory their own distinct schemes of representations, for the most part symmetrically disposed and arranged with due regard to symbolic sequence.

The method of execution, upon close examina-

opus sectile, the floor of the Cathedral of Siena stands quite alone. Although examples of a similar sort of paving decoration are to be found to a limited extent in the Cathedral at Lucca, in the Piccolomini Chapel at San Francesco in Siena and in the Chapel of Santa Caterina in San Domenico, in the same city, it was only in the Cathedral of Siena that this species of floor embellishment attained perfect execution and was employed to an extent that compels at least the wonder, if not the admiring approval, of all who behold it.

The whole pavement (Fig. 3) represents a daring and original conception, the fulfillment of which required a number of years and the services of many designers and artificers—a conception that contemplated covering the entire floor space with a series of pictorial compositions wrought in stone. The major designs were based upon scriptural, apocryphal and symbolic subjects (Figs. 6, 1, 4), while the minor designs, such as the enclosing borders, contained geometrical patterns (Fig. 1) and a great diversity of graceful and fascinating renaissance motifs (Fig. 5).

The work began about the middle of the fourteenth century and was carried on until the middle of the sixteenth. Indeed, a few additions in the same manner were made as late as the latter part of the eighteenth century. Altogether, about fifty artists, at one time or another, had a share in the work, some of them, such as Pinturicchio and Beccafumi, men whose renown in other fields of art has made their names famous. Considering the number of artists engaged and length of time over which their labors extended, it would be strange if the total result did not show evidence of some evolution in technique and con-

Fig. 6. Elijah and Ahab, from Design by Beccafumi, Cathedral of Siena

tion, proves to be singularly direct and not nearly so complex as might, upon a superficial glance, appear. The pieces of marble are of various sizes, frequently large, and are laid together very much in the manner of the units in puzzle maps, in irregular segments, yet in strict accordance with design.

The pavement is executed very largely in black and white marble. Much of the earliest work, and likewise much of the best, was done altogether in black and white. In other compositions, however, red marble was introduced for the ground and black was used for the sky. In the decorative borders that framed the compositions marbles of divers colors began to be employed at an early date. Later they found their way into the main compositions themselves and greens, reds, yellows and other colors, sometimes managed with striking effect, are to be seen in some of the work. Pinturicchio, with his passion for color, was especially given to polychrome treatment.

The subjects were first silhouetted in white marble let into the background of black, or of black and colored, marble. Details were then wrought upon the white marble by engraving lines with a graving tool or fine chisel; next the lines were accentuated by dots or small holes made with a trepanning drill and then these incisions were filled up with mastic or stucco, in the manner already indicated, and connected so as to appear as one continuous line, thick or thin, as required by the design.* There is comparatively little filling of extensive sinkages with mastic or stucco, and the marvelous result is compassed chiefly by adroit composition of the masses and by the nicest fitting of the whites into the black, or black and colored, background. The work is virtually sculpture in two dimensions.

The pieces of white marble forming the design in silhouette are not so numerous as one might at first imagine. In the earlier part of this *commesso* work, as the Italians call it, there is no attempt at shading through the use of graded hues of marble. It was not until the later stages of the process that this element of complexity was introduced, with a consequent loss of virility and directness.

In Fig. 1, showing the Emperor Sigismund on his throne, we see one of the best examples of the earlier method of treatment, while in Fig. 6 where, to a certain extent marbles of graded tone are introduced for shading values, may be seen the method of the later treatment which of course greatly enhanced the decorative appearance.

The chief function of the decorated pavement is to supply texture and color in the floor area so that both may support, and be in harmony with, the composition of the entire interior and minister to its enrichment and interest. This may be attained by the multiplex use of repeating patterns, or the scheme may go beyond the mere employment of varied repeats and may supply spots of special interest whereon the eye may rest and find delight, as in the floor of the Cathedral at Siena, so long as the monumental or symbolic and conventionalized treatment is maintained.

* The mastic used at Siena was composed of pitch, resin and pounded potter's clay, and took on a surface nearly as hard as the marble itself.

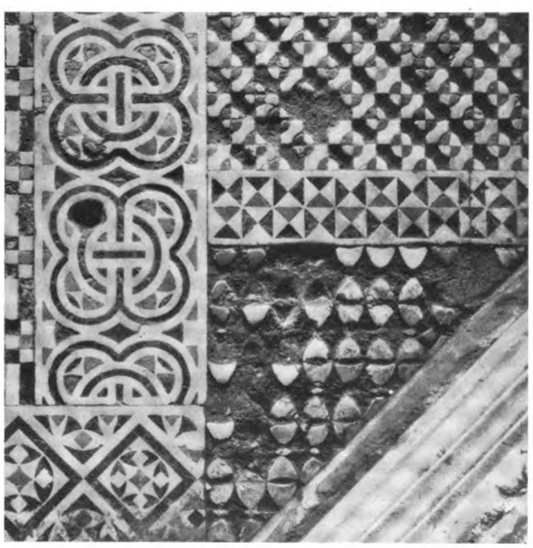


Fig. 7. Section of Inlaid Marble Floor in the Baptistery, Florence

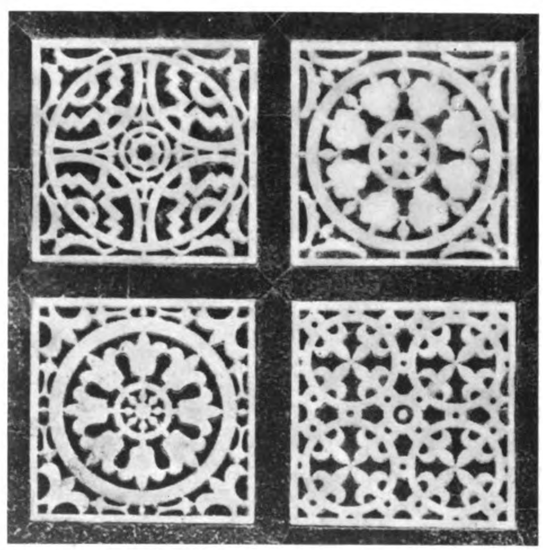


Fig. 8. Detail of Floor Pavement in San Miniato al Monte, Florence

The Draftsman's Own Data File

By H. VANDERVOORT WALSH

ARCHITECTURAL or constructional drafting requires so much information back of it that it often seems that the actual drafting is merely incidental to the knowledge which must be at the finger tips of the draftsman. In fact there is so much to be retained in the mind that the experienced draftsman comes to the conclusion that it cannot all be kept there and so looks about for some other means. Of course a little note-book or a library of text-books is the most natural thing to turn to. Both methods are cumbersome, however, and as the draftsman as well as any other worker needs system, some suggestions might aid him.

If he will examine the question carefully, the draftsman will have little difficulty in appreciating the scattered condition that his necessary working data is in. Hand-books, text-books, building codes, insurance regulations, magazines, manufacturers' catalogs and note-book jottings are a few of the things he will want. Unless he knows exactly where to look he will spend more time looking for information than it is worth. The real solution of the problem is to develop what is here called the draftsman's own data file. This is essentially nothing more than a card index, but it is planned to meet the requirements of the draftsman's peculiar needs. Most books are intended not for the draftsman, but to aid the average builder, superintendent, specification writer or draftsman, and therefore they contain a great deal of material which is not of any help in the particular emergency at hand, but which, nevertheless, must be waded through to get at the matter relating to the drafting. Thus more valuable time is lost.

There is nothing unusual about the equipment necessary, but the arrangement of the data file is the unique part. The best sized cards to secure for this file are 5 x 8. A light file box about a foot deep should also be obtained as well as a more permanent file case with a number of drawers in it, but this might be acquired after the small file box has been outgrown. The cards ought to be cross sectioned so that scale drawings in the form of freehand sketches can be made on them. A good set of blank signal cards should also be included.

The chief thing to bear in mind in making this file is that it is intended to simplify matters and therefore it should not contain anything that is not absolutely essential. As far as possible, every card should have its information in drawing form with plenty of notes. Standard sized details of such things as plumbing fixtures should be assembled on a card so that they can be slid under the tracing and made to fit the desired location and then copied line for line through the linen. This plan of having scale drawings of standard forms on the cards and using them to trace over whenever they are needed is a great labor saver.

The material essential for this file will be found under two heads. First, we have facts which limit the design because of certain constructional requirements. In certain localities there are customary ways of doing things. Then too, our materials and shapes limit our designs and therefore we must have a record of these facts. Building codes and insurance regulations are also necessary data, but the most important are cost-saving schemes.

The second set of limitations falls under usefulness. There are certain standard sizes which experience has shown certain articles should be in order that they may be useful. Then too, there are sanitary considerations which are essential. Light and ventilation, climatic regulations and fireproofing are a few more limiting factors of design which must be handy when the draftsman is busy, and above all are the factors which are peculiarly connected with the purpose and equipment of a building.

To get anywhere at all, these things must be known by the draftsman. The artistic development of the design comes naturally along when these problems have been solved.

We can therefore divide the file into two main divisions and entitle them (*A*) *Construction Requirements* and (*B*) *Usefulness Requirements*. Everything collected then will be placed under one of these headings and given the signal letter of either (*A*) or (*B*).

On the whole, the file might be classified somewhat in this manner:

- (*A*) *Construction Requirements*
  - *1—Customs of Construction*
    - *a, Carpentry*
    - *b, Masonry*
    - *c, Metalwork, etc.*
  - *2—Materials and Shapes*
    - *a, Carpentry, etc.*
  - *3—Building Regulations*
    - *a, Carpentry, etc.*
  - *4—Costs*
    - *a, Carpentry, etc.*
- (*B*) *Usefulness Requirements*
  - *1—Sizes Relative to Use*
    - *a, Carpentry, etc.*
  - *2—Sanitation*
  - *3—Light and Ventilation*
  - *4—Climatic Regulations*
  - *5—Fireproofing*
  - *6—Equipment*

This list is merely a skeleton outline or suggestion for the file. The signal cards for the main headings might preferably be red and those for the subheadings, like *Carpentry, Masonry*, etc., which are repeated for each main division, might be yellow. Corresponding to the filing method of the cards there could be a master list which would record every card in the file and exactly where it goes. This list is used for rapid reference only, for it gives a bird's-eye view of the whole index. For convenience it might be placed on the inside of the file box cover or mounted on a heavy piece of cardboard and hung near enough for use.

Every card might be marked with its various code letters and numbers so that its exact location in the file will be established. The mark (*A*) will determine its location in the first division, while the further note *2* will locate it under *Materials and Shapes* and then the small code letter *b* will indicate that it comes under *Masonry*, etc. For rapid reference a number of green signal cards should be used which can be slipped in the place where a card is removed and thus aid in securing its quick return to the file after using it.

With this brief outline of the filing system, let us examine more carefully the sorting out of our material for use. Do not forget that this information is for drafting only and that we do not want to include anything else, otherwise its purpose will be defeated. As far as possible all the notes on the cards should be made by means of scale drawings and little explanatory jottings of sizes and purposes. No attempt should be made to record any artistic forms, for that is not included in this file.

Under (*A*) *1—Customs of Construction* many notes will be made of any peculiar methods used in the community where the work of the office is mostly located or of certain odd methods of doing things which the boss has decided upon as standards for his office. It is curious how many traditions there are floating around which have no more reason to exist than that things have always been done that way. A man may some day have the courage to buck up against them and refuse to follow them but that has nothing to do with the fact that he is supposed to know them. Under the subtitle of *Carpentry* will fall most of this information. The chief thing to note in classifying material under this heading is that it consists of the unusual kinks —things which are very local in character. Perhaps there is a certain way of designing a sill for the houses in a certain locality. It would be well to make a note of it, for someone might make one a laughing stock if in a design one showed a sill copied from a well known text-book on carpentry. It is not a case of which is right but of doing as the Romans do when you are in Rome.

Facts to be collected under (*A*) *2—Materials and Shapes* are very numerous. There are many standard sizes and shapes of materials which must be known before any adequate design can be made where they are used. This information lends itself to tables better than drawings, although in many cases certain materials demand certain methods of construction peculiar to the manufacturers' development, and a few sketches may aid the memory. One may even have suggested references to certain catalogs where more information can be obtained; better yet it would be to clip out any particularly useful prints or tables from these catalogs and paste them on the file cards. In doing this it is always wise to paste another piece of paper on the back of the card, otherwise it will have a tendency to curl and destroy the even order of the index. Try to pick out the essential facts which will aid directly in drafting. There are many so-called standard sizes of dressed lumber, but there are actually only certain real standards which one will use in designing. It is this kind of selective classifying one must make in order to get rid of a lot of confusing facts. The same is true when it comes to standard sizes of bricks or other burnt clay products. There are many different makes and sizes but it would be foolish to attempt to include them all in the file. What one wants are the sizes of those materials actually being used.

The same thing is true when it comes to facts for the file under (*A*) *3—Building Regulations*. It is not necessary to file the entire building code, piece by piece, in the little box. All that is necessary is to have certain peculiar restrictions and certain limitations which a draftsman will hesitate about each time he meets them. Keep in mind that this file is merely a jog to the memory. Only those facts which are difficult to retain in the mind should be classified. Do not overload it with facts which will be of no use whatsoever in drafting. Whenever certain cards become so familiar that their information is well ingrained in the memory the card might be removed from the file for it will only be an incumbrance.

One of the most important parts of the file to keep constantly changing is the (*A*) *4—Costs* classification. In this should be filed all the odds and ends of information which can be gathered concerning the ways of cutting down the costs of construction. There are often many ways of doing the same thing, but the cheapest often will be the way one is interested in. Facts of this nature may not stick in the memory very well so, when one comes across them, a rough sketch, noting the principle involved, will often come in very handy at the critical moment when cost is a vital question. There is an astonishing amount of data of this nature drifting around and it is of such importance that it is often worth a great deal to have it on hand. In fact the average draftsman is quite ignorant of money-saving methods of doing things, and he does not always realize the amount of work which often a few changes of lines on the design will save. In carpentry, masonry and steelwork there is much to be learned in this respect. There will probably be more scientific study of this question taken up in the coming reconstruction days than anyone can predict. After all, the real economy of construction will be in the careful designing of a house and not in trying to find the lowest bidder. Elimination of waste material and energy is more a sign of efficiency than the grinding down of wages and prices, and designers who can show results in this way will be recognized more in the future than they have been in the past.

When it comes to the question of classifying the material under the division of (*B*) *Usefulness Requirements*, as has been previously suggested, the subdivision of (*B*) *1—Sizes Relative to Use* is quite limited in its scope for only those facts which pertain to the actual dimensions of things as they relate to the users are collected. Nearly everything that is designed in a building in the way of usefulness is designed in sizes which are supposed to be most convenient to the users. This is particularly true of the layout of kitchens where all the accessories are supposed to be planned in certain dimensions which give the most efficient use. However there is practically no part of any building which is not affected by these requirements. As there are a great many facts in this line which have been developed by experience and which are fully standardized, it will be almost impossible for the draftsman to keep these constantly at his finger tips, and yet every move he makes must be governed by these accepted sizes. It behooves him, therefore, to get this necessary information into as workable a shape as possible, but at the same time to keep it separate from sizes of things which are really building equipment.

When it comes to collecting data for the classification (*B*) *2—Sanitation* the only thing which should go in is matter relating to certain standards of sanitation. There are many precautions and accepted details of doing things in this department of building design and a convenient file for collecting this information is quite necessary. As this is so intimately linked up with all kinds of plumbing work it would be well to classify such information under this heading instead of as building equipment. Sketches of standard details should be made and clippings of catalog drawings pasted on the cards. Special notes and tables will aid much in recording this data.

Under the heading (*B*) *3—Light and Ventilation* will be filed such facts as those which determine the proper arrangement and sizes for designing windows to give the correct amount of light and ventilation. Any facts related to artificial lighting as it relates directly to the drafting may be filed, but much of this material is more for the use of the specification writer and it should be sorted with care. The same is true in regard to any facts which are collected about ventilation. Many of them do not affect the drawings at all and they will therefore be of no use in this file. It is a specialized file and does not pretend to be anything else. In glancing over catalogs of various ventilating systems it would seem almost that the information is impossible to file, but on a careful analysis of the facts it will present no trouble.

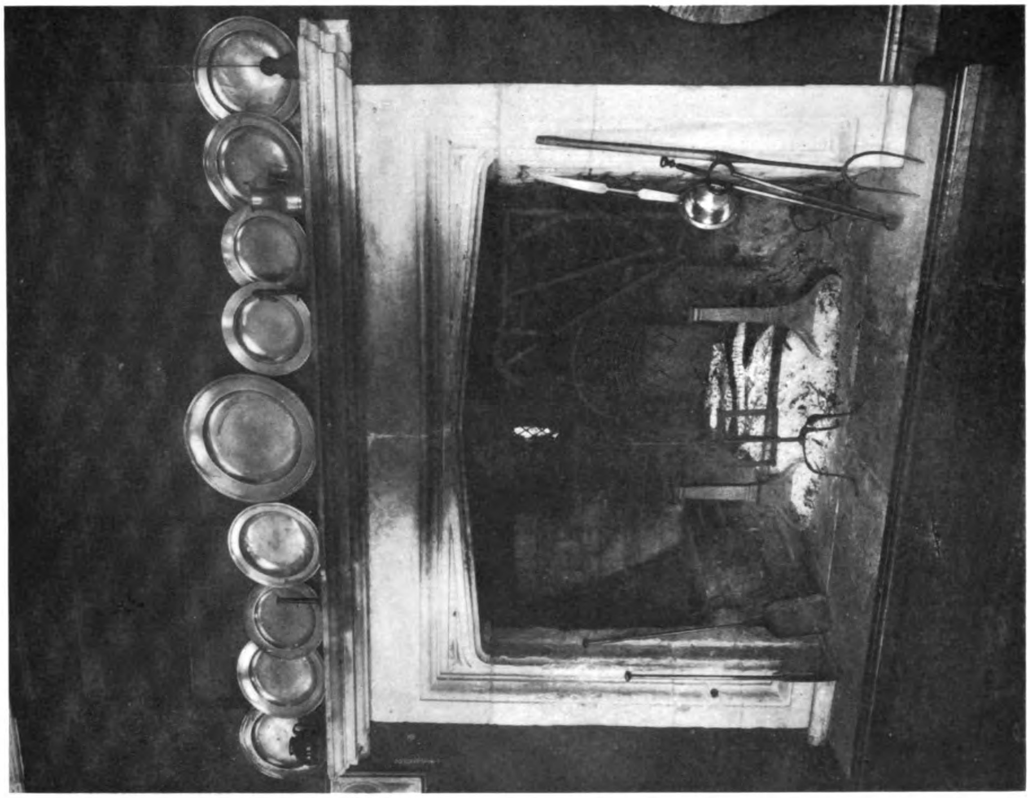
The classification (*B*) *4—Climatic Regulations* will not require much attention if the draftsman is confining his work to certain localities, but if his field is broad it will be well to collect facts relating to this subject.

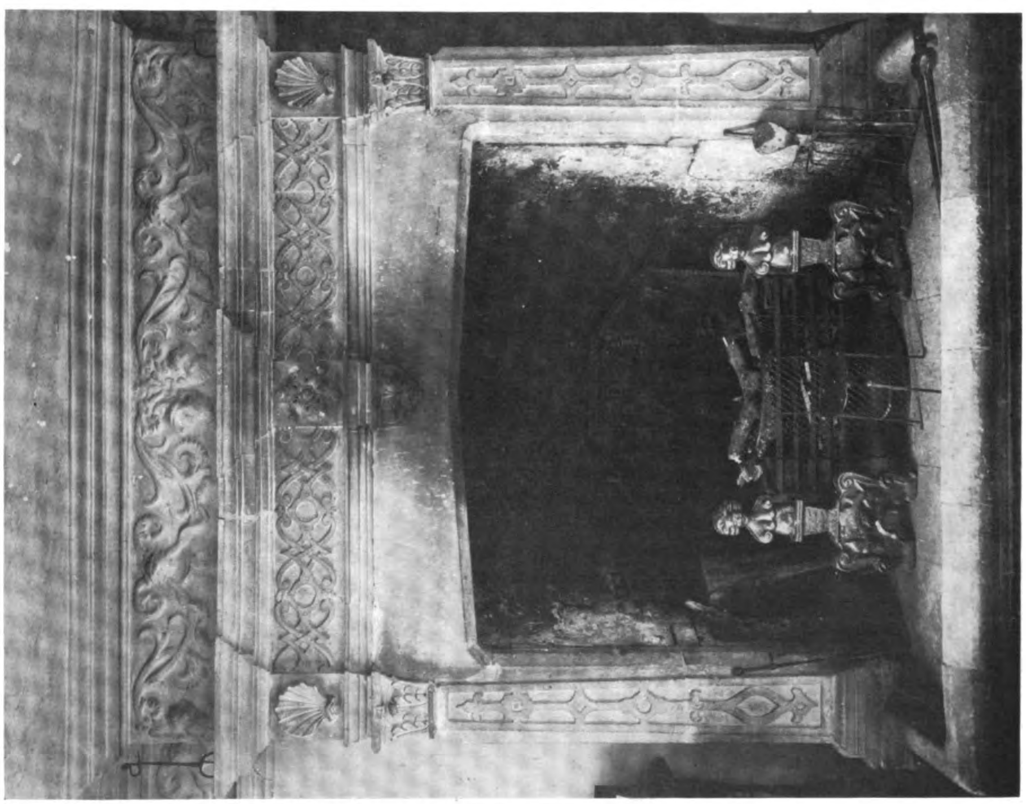
(*B*) *5—Fireproofing* is a classification of data which can easily be made very bulky if it is not pruned down with care. There is so much material of this nature that is irrelevant to drafting and common practice that it is sometimes confusing. A good deal of common sense will have to be exercised in collecting this working data. It will hardly be worth while to collect more than is actually necessary for the types of buildings which the draftsman is handling.

The same will hold true of (*B*) *6—Equipment* where there is so much information to keep. File only those facts which are standard for all types of buildings and leave out all which do not apply to the peculiar types which the draftsman is handling. Certain standard sized drawings of furniture will often aid in the layout of a room; by sliding these cards under the linen and shifting them to trial places until satisfactorily located, the drawings may be traced.

In general, the entire file should be looked upon as a personal file and memory jog. No two files should be alike. Just as soon as information contained in the file becomes second nature, eliminate the card. A secondary file might be kept where these obsolete cards can be placed, but this is optional with the draftsman, according to his faith in his memory. Make the file highly specialized and train the powers of elimination. Record as far as possible everything in picture form, for this will gradually impress the facts upon the memory better than anything else could do, and every detail that can be filed in the memory can be eliminated from the file.

There is probably no better way to record dry facts and statistics, when we want to get them impressed on the memory, than to take them in the spirit of fun and try to convert them into funny, exaggerated pictures. For some reason or other the impression on the mind is more lasting, and as the draftsman has a natural gift for visualizing he can develop in this way a memory for facts and statistics which will make the average man marvel. The ability which the ordinary draftsman has in him would astonish the world if it were released by proper methods, and the day is not far off when his emancipation from many evils will come. One of the ways by which he can free himself is to use all the methods possible for the reduction of the drudgery of drafting, and it is to be hoped that the suggestions given will be of aid in this respect.





TWO STONE MANTELS FROM OLD COTSWOLD HOUSES IN ENGLAND

In the example at the left the frieze above the mantel is a vigorous piece of old English plaster work. The mantel at the right is placed against an oak-paneled chimney-breast

A Modernly Planned Orphanage

WHITEHOUSE & PRICE, ARCHITECTS

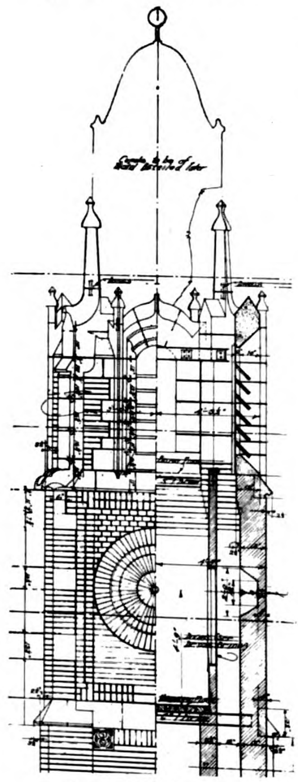
By H. C. WHITEHOUSE

THE Hutton Settlement is a cottage planned orphanage situated about nine miles east of Spokane, Washington and is built on a piece of ground at the base of hills forming the north side of the Spokane valley. The institution was the gift of Mr. L. W. Hutton, of Spokane.

The children are admitted into the institution at school age and the boys and girls are housed in separate units or cottages, of which there are four. The capacity of each cottage is about twenty-five. The ages are graduated from six years up to high school age.

The buildings are planned for the efficient handling of the domestic work by the children themselves under the direction of a cottage matron, or mother, who directs the cooking, dishwashing and general housework done by the children.

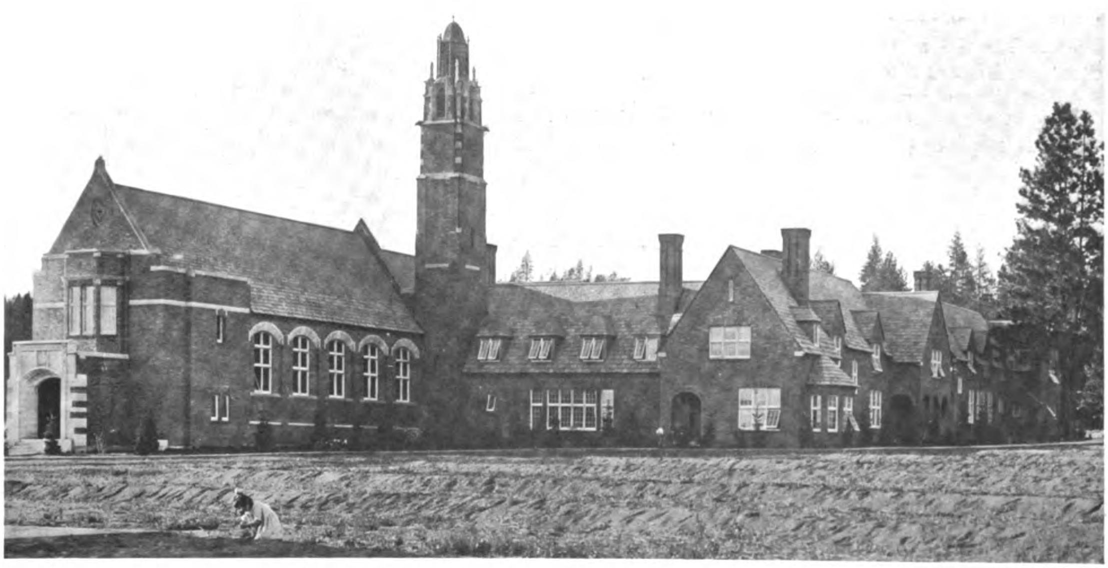
The requirements in each cottage plan were practically the same,each plan varying somewhat in general shape to create different exteriors. The plan of each cottage consists, on the first floor, of a large living room and living porch, matron's sitting room, sewing room, dining room, kitchen, bath and large washroom, together with lockers; on the second floor are bedrooms, matron's bedroom and bath, a large general toilet and one separate bathroom. The attic, or third floor, is divided into several single rooms.



Detail of Clock Tower

A definite plan for housing the children in the sleeping rooms is followed. The youngest children are placed five and six in a room, and the next or middle group are placed three in a room, while the oldest are placed in single rooms. All bedrooms are well ventilated, especially those holding groups of three and five children. The bedrooms of five-bed capacity have windows on three sides and those of three-bed capacity have ventilation from two sides. All windows and beds are placed so that no child has a direct draft across the head, and all beds are single.

The general scheme of planning has been worked out embodying



View of Administration Group with Auditorium Wing at Left

Detail of Cottage Number Two

no exposed woodwork in the way of eaves or other structural members. The roofs are slate of variegated grays, gray-greens and a few mottled purple and green. The slate is graduated from a double, one-inch thickness at the eaves, up to one-fourth inch at the ridge. The eaves slates start on the brick work which is corbeled out with special long-length brick, the ends of which terminate in stone corbels.

The windows throughout are fitted with special window adjusters, which gives 100 per cent ventilation. The screens are double-hung, and are all inside. The porch floors are laid with red quarry tile.

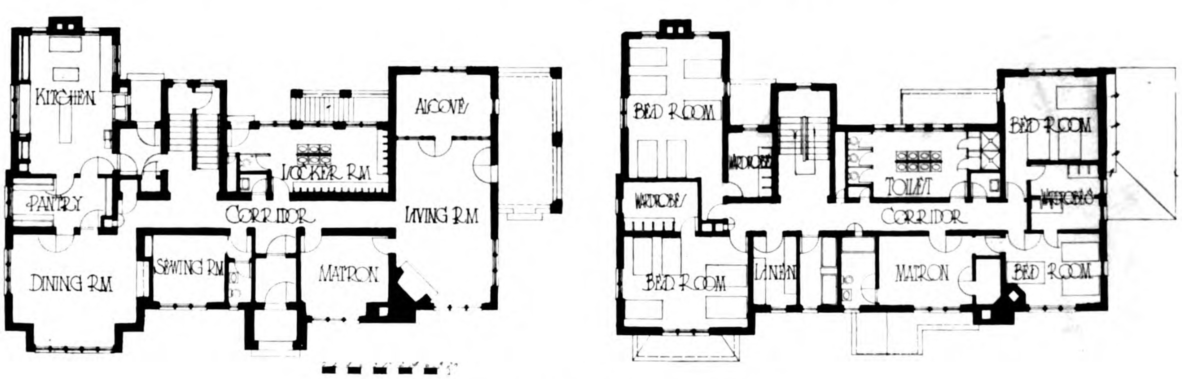
The interiors throughout are finished in quarter-sawed white oak stained a silver gray. The floors throughout are oak and maple. A feature of the buildings, particularly the cottage units, is the terrazzo stairways. This material was selected because of its great durability, and from the standpoint of sanitation. All angles are coved and the balustrades are solid with handrails attached.

the principles as set forth by the writer in his articles of February and March, 1919, published in The Architectural Forum.

The construction throughout the group is fireproof. The foundations are of concrete and the walls are of hollow clay tile, faced with a tapestry brick. The floor construction is flat slab in most cases, and bears directly upon the masonry walls. All partitions are hollow tile.

The slate roofs are of framed, heavy timber construction and the buildings in most cases have

The general toilets are an important feature in the cottage units. The wash basins, eight in number, are arranged back to back against a low wall which is built up from the center of the floor, all plumbing pipes being built into the wall. The basins are placed at different levels to accommodate the heights of the various children. The water closets, three in number, are of the wall type, fitted with flush valves. The shower baths, which are also in the general toilet rooms, are overhead showers. The toilet room floors, wainscots, water closet and



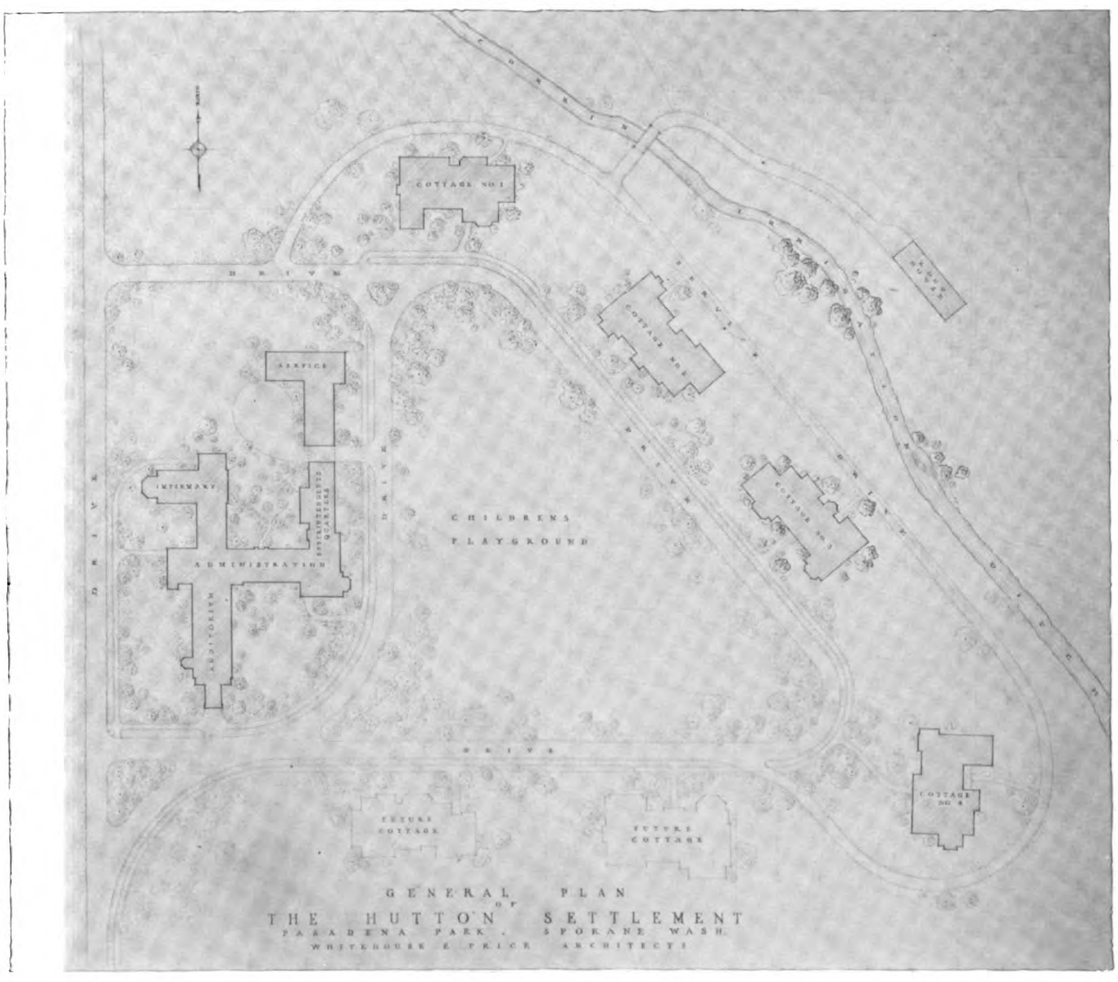
First and Second Floor Plans of Cottage Number Two

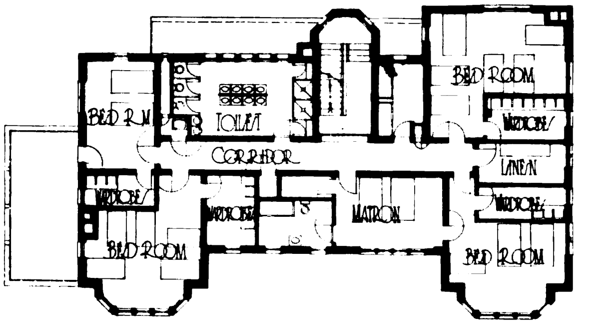
First and Second Floor Plans of Cottage Number One

shower partitions, are all terrazzo. The windows from the toilets are fitted with steel casements, glazed with plate glass. This type of window was chosen to preclude any possibility of shrinking and swelling caused by steam from the shower baths.

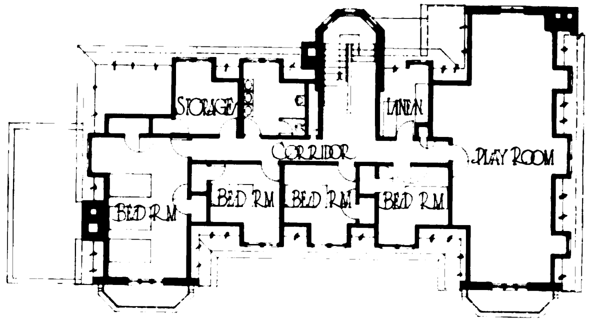
There is also a separate bathroom for the bathing of the small children by the matron, which contains two bath tubs. One is set on the floor and one at a height of two feet from the floor, for facilitating the handling of the bathing of the smaller children.

The kitchens, where a very important part of the child's training comes in, are entirely modern and up to date. All cupboards are built flush with the walls, all doors, etc., are flat finish, without panels or mouldings. The kitchen floors are linoleum cemented over the concrete floor slabs

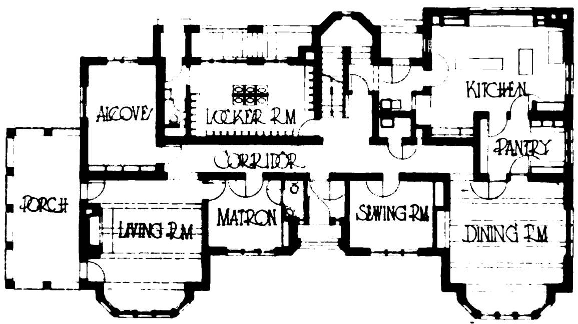




Second Floor Plan



Third Floor Plan



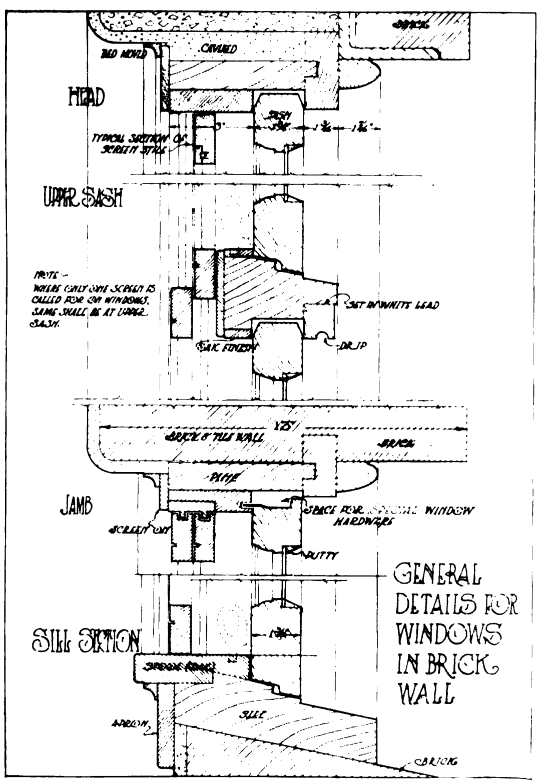
First Floor Plan of Cottage Number Three

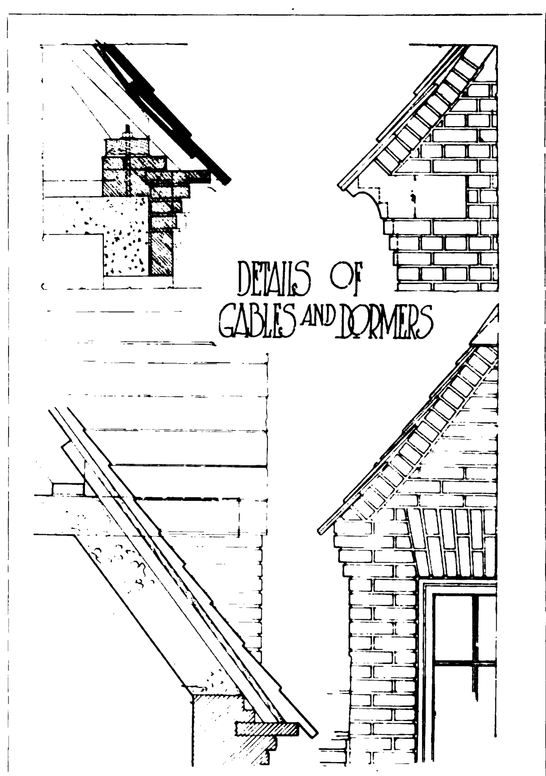
which are finished with a terrazzo cove base around the entire room.

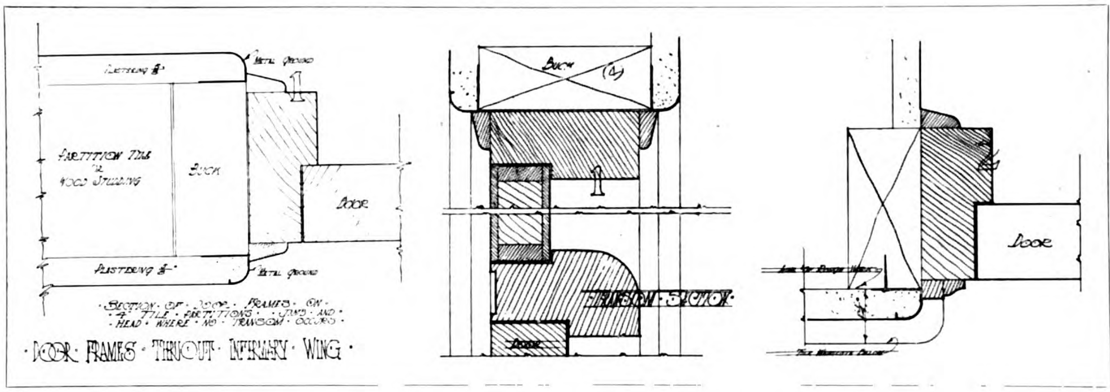
The cooking is done on electric ranges. The dish washing sink, or sink for general use, is of a special design type which is placed in the center of the kitchen. These sinks have double sets of faucets, with double compartments to facilitate the washing of dishes by a large number of children; it is possible for six children to wash and dry dishes at the same time. There is also a small vegetable sink at the rear entrance vestibule for the washing of vegetables.

The refrigerators have floors of tile and the interiors are finished in white enameled metal. These are built in and form an integral part of the construction and are iced from the outside.

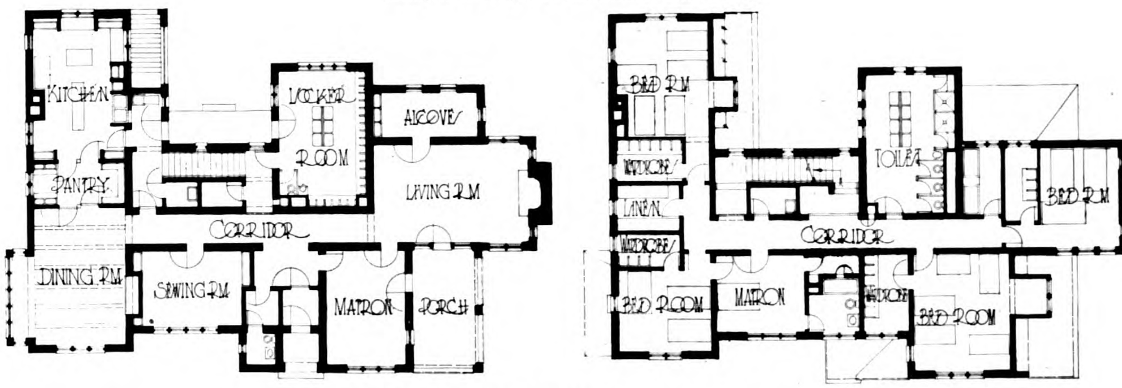
The administration building contains the superintendent's quarters at the front, and in the rear the quarters for help, the kitchen, electric bread bakery, refrigerating plant for the storage of meats, general







Examples of Simple Treatment for Interior Finish



First and Second Floor Plans of Cottage Number Four

View of Cottage Number Four, Hutton Settlement, Spokane, Washington

Kitchen Showing Special Fitments

Infirmary Ward in Administration Group

sewing room, rooms for relief matrons, a general reception room for the entertainment of guests, and an auditorium with a stage, moving picture booth, etc. The auditorium is used for dances and other purposes of a social nature and its brick walls and open timber roof make it one of the most interesting details of the Settlement. The tower will house the clock, which is not yet installed.

The infirmary occupies one wing of the administration building, but is so planned that it is apart from the rest of the building, and is quiet. The infirmary is most complete, the second floor being given over to boys and the first floor to girls. A small surgery department takes care of minor operations, such as the removal of tonsils, adenoids, etc., and a well equipped dental department with waiting and operating rooms is available when needed. Both surgery and dental departments are provided for the use of visiting surgeons and dentists. The finish of the walls and woodwork throughout is white enamel and all trim around windows, doors, etc., has been omitted and plaster returns substituted. The angle at the floor is a maple cove and every detail throughout has been well studied for thorough sanitation as will be seen by details on preceding pages.

In the planning of the buildings the architects have striven for an air of domesticity and anything that would have a tendency to suggest an institution has been omitted. One of the requirements of the donor was that the institution should have a homelike atmosphere. For this reason everything possible has been done to give the Settlement the atmosphere of a home. Its character is suggested by the little reception room in which visitors are received and in the sunny living rooms which are provided in the different buildings. A detail which helps to keep away the institutional atmosphere is the individual heating plant for each building. A central heating plant would have called for a high chimney which might have been a very conspicuous feature of the group.

Dining Room in Cottage Number Three

Living Room in Cottage Number Two

Hutton Settlement, Spokane, Washington

An Apartment House of Distinctive Design

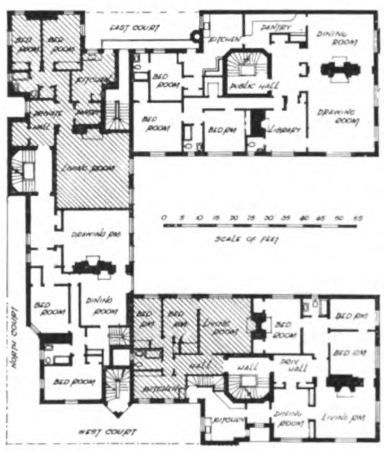
RICHARD ARNOLD FISHER, ARCHITECT

THAT some very successful building is often attained largely as a result of what seemed to be heavy handicaps has been proved again and again in the modern practice of architecture, and a recent instance is found in an apartment house of a distinctive type which has been recently completed near the foot of Beacon Hill in Boston.

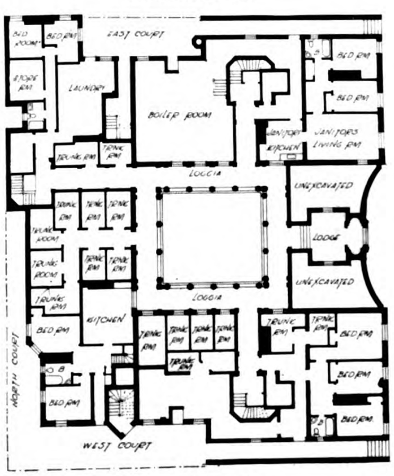
The appearance of the building as well as its interior planning are due in a large measure to circumstances which at one time did not seem to be favorable to the development of a successful apartment house. A group of ten city houses had been designed for the site, planned to occupy three sides of a hollow square, most of the houses facing the open space at the center of the plot. The building of the group of houses was abandoned when the foundations had been completed and the problem which confronted the architect was, therefore, the planning of an apartment house which could be erected advantageously upon very costly foundations which had been planned for structures of quite a different nature.

As the plan developed what was to have been an open square or garden, upon which ten residences might face, has become an open courtyard or patio enclosed upon all four sides by an open loggia; the present building, built around three sides of this courtyard, rests upon the original foundations, the plan having been so worked out that advantage has been taken of walls, piers, footings for chimneys, etc., which were originally built.

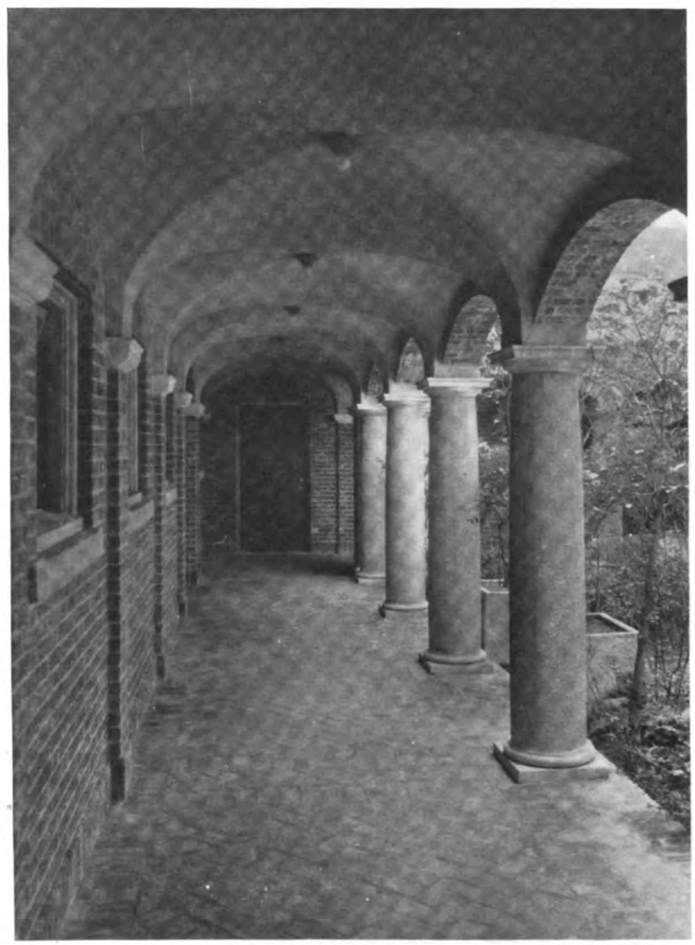
The exterior of the building is attractive and unusual. Outer walls are of brick with trimming of stone and considerable use has been made of iron in the form of grilles and of clay pipe of different sizes which has been employed with excellent results in the working out of horizontal panels in the parapets about the loggia and at the



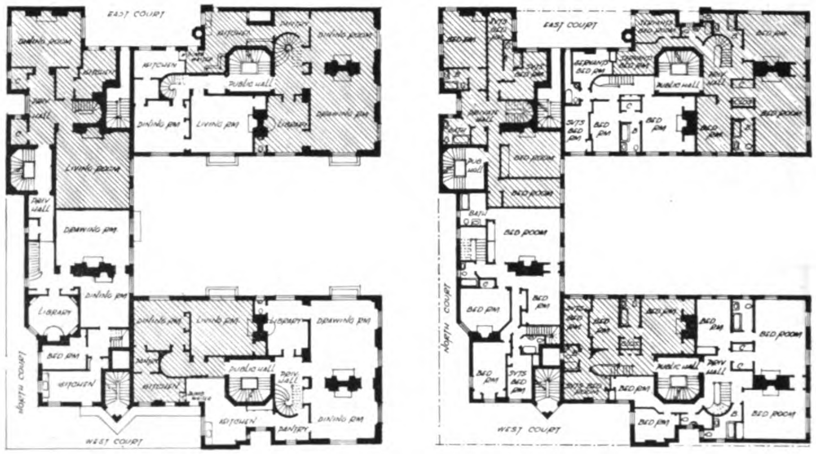
First Floor Plan



Basement Floor Plan


Loggia Entranceway around Courtyard

top of the building, around certain balconies and to screen open light shafts on the exposed sides of the building. Since the structure covers a somewhat ample area it has been possible to make the apartment house the required size without more than six stories which include the basement, or entrance, floor.



Second and Third Floor Plans Showing Typical Duplex Apartments

From the street the main entrance is directly into a small lodge or vestibule from which visitors are announced to the various apartments. From this lodge one passes down a short flight of steps into the patio or courtyard—a tiny garden, surrounded by a vaulted loggia—which occupies the center of the property. Opening from this loggia are the various doorways into spacious entrance halls where electric elevators lead to the different groups of apartments. The planning of the building has been done so that the living and dining rooms and all master bedrooms face either the street or the courtyard, which gives to each all necessary light, air and sunshine as well as an attractive outlook.

The apartments, which are of different sizes, vary greatly as to plan; some of them are upon one floor while others, being duplex apartments, occupy parts of two floors, private stairways leading from one floor to another. The arrangement of the duplex apartments has been influenced to some extent by the planning of the exterior; thus, since the larger windows with balconies occur at the second and fifth floors, duplex apartments upon the second and third floors are arranged so that the more important rooms are upon the lower floor with stairways to the bedrooms above, while the duplex apartments upon the fourth and fifth floors have their more important rooms upon the upper floor with the bedrooms upon the floor below.

Example of Large Fifth Floor Windows

Delivery entrances from the street give access to the service quarters of all the apartments. The space surrounding the patio or courtyard, upon the basement floor, is divided into separate trunk or storage rooms one of which belongs to each apartment.

While the building constitutes an extremely successful solution of a difficult problem it is also noteworthy as representing an entirely new idea in the planning of apartment house structures. A great part of the attractiveness of the house is due to the taste and skill with which the architect has planned the patio or courtyard with its fountain, brick walks and heavy growth of shrubbery, surrounded by the open loggia with its brick paved floors and its plain gray vaulted roof.

CHARLES A. WHITTEMORE, *Associate Editor*

Building Foundations

PART II

By J. R. WORCESTER, C.E.

IN THE FORUM for September we considered the external conditions which govern the design of foundations, including the loads to be carried and the support afforded by the soil. Of course the composition of the soil is a highly important factor in determining its bearing capacity and considerable data was given in regard to the capacity of soil composed largely of clay. Other very important considerations are presented when the soil is largely, or chiefly, of sand.

With sand the supporting power is dependent upon several factors. One of these is water. Water does not affect the supporting power seriously except in the case of a very fine sand which flows readily with the water. With this, if the water is supplied in unlimited quantity under some head, the sand seems to become super-saturated with it, and to become springy or quaky. In such a condition we have what is called "quicksand" and a load placed upon a bed of it may settle of its own weight until submerged. If, however, the whole surface is covered and there is no chance for the sand and water to escape, it will carry any reasonable load. Another quality of sand which affects its bearing power is its size of grain, not so much the absolute as the relative size. That which contains large and small grains acquires a "cemented" quality giving great resistance to applied loads. A third point of difference between sands is in the shapes of the grains. If grains are sharp and irregular the soil will move less under pressure than when grains are round, from water action, as in beach sand. The nature of the soil to be built upon will thus be found to be a very important matter in planning the foundations which are to be set upon it.

By the word foundation as herein used we mean the portion of an exterior wall below the ground level, and the part of a pier or interior wall below the basement floor, including the footing. The design of the foundation as thus limited will in general be the same, whether supported directly upon the soil or upon piles when placed at frequent intervals.

Interior Walls

The simplest problem is that offered by an interior wall, where the load is uniformly distributed along the wall and the footing is symmetrical about the middle line of the wall. In this case the width is determined by dividing the load per linear foot by the supporting power of the soil per square foot. The depth of the foundation is generally made only enough to give the necessary spread without overstressing the materials, though greater depth may sometimes be required to reach a proper supporting medium or, in case the basement is open to the air, to get below the danger of frost. When extra depth is not needed, and the spread is moderate, all that is required is a simple footing course. If squared stone is available at a moderate cost this footing can be simply constructed of stone blocks. For ground pressures not exceeding 5 tons per square foot the depth of stone may be safely taken at twice the projection on either side of the wall. If this would require stones thicker than can be easily obtained, or if no stones are available, concrete is the natural material to employ for this type of foundation.

When the projection of the footing course beyond the face of the wall is not great and a good concrete—that is a mixture as rich as 1 part cement to not exceeding 7½ parts of fine and coarse aggregate—is employed, no reinforcing is necessary. Under these circumstances the allowable ratio between projection and depth is dependent upon the pressure per square foot on the soil. The relation may be expressed by the formulæ:

$$\frac{c}{d} = \sqrt{\frac{1.8}{w}} \text{ or } \frac{c}{d} = \frac{2.88}{w}$$

in which c = the projection of the footing on each side beyond the face of the wall, d = the depth of footing, both in the same unit, and w = the soil pressure in tons per square foot.

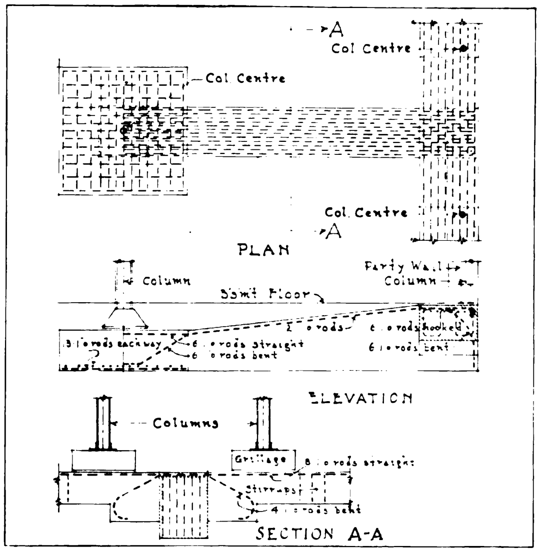
The first of these equations is based upon the bending fiber stress and the second upon the shear, and that giving the lesser value should be used. The first governs for soil pressures up to about 5 tons and the second for greater pressures.

The following gives values of the ratio for pressures on the soil of from 1 to 10 tons per square foot:

Soil pressure; tons per sq. ft.	Ratio of projection to depth	Soil pressure; tons per sq. ft.	Ratio of projection to depth
1	1.34	6	.48
2	.95	7	.41
3	.77	8	.36
4	.67	9	.32
5	.58	10	.29

Table 1

By the use of a proper amount of reinforcement near the bottom of the footing the ratio of projection to depth may be increased. In the case of reinforced footings the concrete should be as rich as 1 part cement to not over 6 parts of mixed fine and coarse aggregate; a sufficient depth of concrete to properly protect the steel should be allowed below the steel — say 3 inches — this not being included in the value of the depth given below; and the



Cantilever Foundation under Party Wall Columns

reinforcing bars should be anchored at the ends by forming hooks or by other suitable means. The area of the steel should be not less than 8/10 per cent of the area of concrete above its center for soil pressures below 4.65 tons per square foot, above which pressure the percentage of steel should be as given by the equation:

$$p = \frac{2.835}{w}$$

and the ratio of projection to depth by the formula:

$$\frac{c}{d} = \frac{7.56}{w}$$

Below a soil pressure of 3.54 tons per square foot the percentage of steel should be 0.8, and the ratio of projection to depth as given by the formula:

$$\frac{c}{d} = \sqrt{\frac{16.125}{w}}$$

c being the projection of the footing beyond the face of the wall on each side, *d* the depth from center of steel to the top of footing, and *w* the pressure on the soil in tons per square foot.

Values of the ratio *c/d* for various soil pressures from 1 to 10 tons per square foot are as follows:

Soil pressure: tons per sq. ft.	Ratio of projection to depth	Percentage of steel
1	4.01	.80
2	2.84	.80
3	2.32	.80
4	1.89	.71
5	1.51	.57
6	1.26	.47
7	1.08	.41
8	.94	.36
9	.84	.32
10	.76	.28

Table 2

As the size of footings increases a point is soon reached where the use of a single rectangular block becomes uneconomical through the waste of concrete in the upper corners of the block. This concrete serves no useful purpose and may well be saved by the construction of steps or by beveling off the corners. Tables 1 and 2 may be used in stepped footings by using for *c* the entire projection beyond either riser and for *d* the depth below the bottom of the same riser.

For example, with a soil pressure of 5 tons per square foot and a total projection of 5 feet beyond the face of the wall, a plain footing would need to be 8.62 feet deep,

for:
$$\frac{5}{d} = .58$$
$$d = \frac{5}{.58} = 8.62$$

This depth may be divided into say an upper block 4 feet deep and a lower 4.62 feet deep. The allowable projection of the lower block would be 2.68 feet,

for:
$$\frac{c}{4.62} = .58$$
$$c = 4.62 \times .58 = 2.68$$

The projections of the upper block beyond the face of the wall would then be 5 — 2.68 = 2.32 feet.

In case a reinforced footing in three steps were desired it might be designed as follows. By Table 2 the depth above the steel should be about 3.3 feet,

for:
$$\frac{5}{d} = 1.51$$
$$d = \frac{5}{1.51} = 3.31$$

If each step is made 1.1 feet deep, the projection of the lowest beyond the second would be 1.66 feet,

for:
$$\frac{c}{1.1} = 1.51$$
$$c = 1.51 \times 1.1 = 1.66$$

The projection of the lower two beyond the upper step would be 3.32 feet. The projection of the upper step would then be 5 — 3.32 = 1.68 feet.

The percentage of steel is based upon the total depth at the face of the wall and, in the case of a stepped or beveled footing, the entire area is required to the ends of the bars, which should be fully anchored.

It is generally best to make the lowest block rectangular and not beveled. Where the soil is good this lower block can be cast in a neat excavation without forms and the forms can be built on top of this block. It is important that the set surface of the lower course should be thoroughly cleaned and saturated with water when proceeding to pour subsequent courses. By beveling the upper courses concrete may be saved but the cost of forms is somewhat greater and it is a little more difficult to work the concrete into place. Except in very large foundations the advantage is not great. The beveled surface should, of course, be outside of the interior intersection of riser and tread figured as just described.

Interior Columns

A square column foundation with the column centrally located will have its bottom dimensions determined by the soil pressure, and a top area large enough to accommodate the column base or pedestal without exceeding the allowable unit stresses. With light loads frequently a single block of stone will answer the purpose, but if the load is too great for this treatment concrete, either plain or reinforced, becomes desirable. The depth of the footing is determined generally by the allowable punching shear on a prism the size of the column base and a depth that of the concrete above the center of the steel—if any is used. The shearing stress should not exceed about 40 pounds per square inch with a plain concrete or 105* pounds per square inch with a reinforced concrete. These figures give the minimum depths shown by Table 3, if we allow a bearing pressure on the top surface of the concrete of 640 pounds per square inch, and assume a square column base.

* This figure is based upon 120 pounds per square inch applied to seven-eighths the total depth.

Total col. load; tons	Min. depth in inches	
	Plain concrete	Reinforced concrete
50	50.0	19.0
100	70.5	27.0
150	86.5	32.5
200	100.0	38.0
250	112.0	42.5
300	122.5	46.5
350	132.5	50.0
400	141.5	53.5
450	150.0	56.5
500	158.0	60.0

Table 3

It will be noted that the depth of the reinforced footings is about three-eighths that of the plain concrete; but it should be borne in mind that with the reinforcement an addition should be made to this depth of enough concrete to protect the steel—say 3 inches—and that the mixture needs to be somewhat richer.

The size of the base is of course determined by the pressure on the soil and, with this and the depth as given by Table 3, the outside dimensions are settled. The amount of reinforcement required in each direction, if given as a percentage of the area of cross section of the footing obtained by multiplying the total width by the depth above the center of the reinforcement, is dependent solely upon the soil pressure per square foot. When the depths are according to Table 3, that is as small as the shearing stresses will permit, the following table will give the proper percentage of steel to use for various soil pressures, as obtained by the formula:

$$p = .246\left(1 - \frac{\sqrt{w}}{6.788}\right)^2$$

in which p = percentage of steel,
w = soil pressure in tons per square foot.
This percentage may be decreased when depths greater than the minimum are used.

Soil pressure; tons per sq. ft.	p	Soil pressure; tons per sq. ft.	p
1	.180	6	.100
2	.156	7	.091
3	.136	8	.083
4	.122	9	.077
5	.110	10	.070

Table 4

The amount of steel required by the above rule should be distributed within a space extending both sides of the column base a distance equal to the depth of the footing plus one-half the remaining

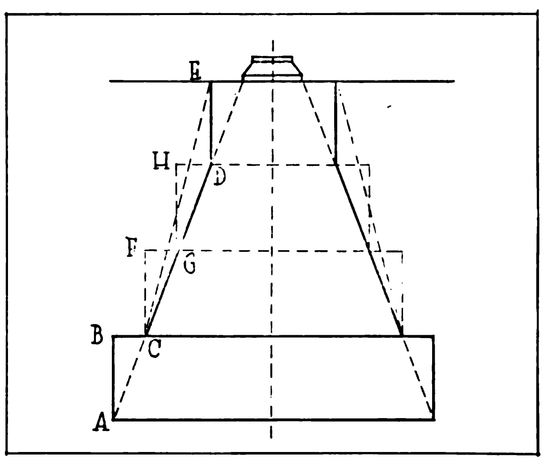


Fig. 1

distance to the edge of the footing. Additional reinforcing bars should be provided in the outer half of this remaining distance, but not necessarily as closely spaced as in the central portion. If the bars are not fully anchored at the ends attention must be paid to the questions of bond and diagonal tension in the concrete.

When the size of the footing is large enough to make it desirable to use a pyramidal shape with beveled or stepped sides, a good rule is to so design the block that no part of a face shall fall within the theoretical truncated pyramid which has for the base that of the lowest course and for the top the column base. Practically this theoretical prism should be increased by making a base course with vertical sides, and enlarging the top sufficiently to provide an area at least twice that of the column base. In Fig. 1 the line *A*, *B*, *C*, *D*, *E* shows the least allowable dimensions of the foundation, points *C* and *D* being on the theoretical pyramid. Lines *A*, *B*, *C*, *E* and *A*, *B*, *C*, *F*, *G*, *H*, *D*, *E* show allowable variations which, by adding a little concrete, economize in form construction. The number and height of steps are matters of discretion. It will be found that a height of about 2 feet will give good results.

Grillage Beams

Before the use of reinforced concrete became general the method used for getting a wide spread of foundation without excessive depth was by means of a grillage or cob-house of steel beams. This method is now rarely resorted to, because it is much more expensive than reinforced concrete. It requires nearly as much concrete to properly protect the beams, and very much more steel, and that of a more expensive character. The only justification for the use of a grillage is where deep excavation is objectionable, either as a matter of expense or because it carries the base to a level where the soil is less satisfactory. As these conditions are sometimes encountered it may be worth while to consider the possible saving of depth.

Soil pressure; tons per sq. ft.	Style of footing	Total load on column in tons				
		100	200	300	400	500
2	Reinforced c.	26.5″	36.5″	44″	50″	55.5″
	Grillage	22	27	35	45	50
	Difference	4.5	9.5	9	5	5.5
4	Reinforced c.	26.5″	36.5″	44″	50″	55.5″
	Grillage	22	27	28	35	45
	Difference	4.5	9.5	16	15	10.5
6	Reinforced c.	26.5″	36.5″	44″	50″	55.5″
	Grillage	18	24	28	30	38
	Difference	8.5	12.5	16	20	17.5

Table 5

With I beams the question of shear does not control the depth, as it frequently does with concrete, but the bending moment is the critical feature. Table 5 gives the data by which grillages may be designed for various soil pressures and loads of from 100 to 500 tons.

Comparing the allowable depth of grillage foundation with one of reinforced concrete we find the results given in the accompanying Table 6.

It appears from comparison that when it becomes necessary to use more than two tiers of beams the saving in depth is not of great importance, and conditions would seldom warrant going to the extra expense of using beams.

Soil Pressure			Total Load on Foundations				
			100 Tons	200 Tons	300 Tons	400 Tons	500 Tons
2 Tons per Square Foot	Beams in Tiers	Top	3-12″ x 31½# x 6′-10″	3-15″ x 80# x 9′-9″	4-20″ x 80# x 12′-0″	4-15″ x 42# x 6′-1″	4-20″ x 80# x 9′-3″
		Mid.	—	—	—	8-15″ x 80# x 13′-11″	12-15″ x 80# x 15′-6″
		Bot.	10-7″ x 15# x 6′-10″	16-9″ x 21# x 9′-9″	15-12″ x 31½# x 12′-0″	17-12″ x 31½# x 13′-11″	17-12″ x 31½# x 15′-6″
	Size of Concrete Blocks	Top	2′ x 7′-1″	2′-4½″ x 10′-0″	3′-4″ x 12′-3″	2′-10″ x 6′-4″	3′-4″ x 9′-6″
		Mid.	—	—	—	6′-4″ x 14′-2″	9′-6″ x 15′-9″
		Bot.	7′-1″ x 7′-1″	10′-0″ x 10′-0″	12′-3″ x 12′-3″	14′-2″ x 14′-2″	15′-9″ x 15′-9″
	Total Height		1′-10″	2′-3″	2′-11″	3′-9″	4′-2″
4 Tons per Square Foot	Beams in Tiers	Top	3-10″ x 25# x 4′-9″	3-15″ x 50# x 6′-10″	4-15″ x 60# x 8′-5″	4-20″ x 80# x 9′-9″	4-15″ x 60# x 6′-1″
		Mid	—	—	—	—	8-15″ x 80# x 11′-0″
		Bot.	7-7″ x 15# x 4′-9″	10-9″ x 21# x 6′-10″	13-10″ x 25# x 8′-5″	12-12″ x 40# x 9′-9″	14-12″ x 31½# x 11′-0″
	Size of Concrete Blocks	Top	1′-11″ x 5′-0″	2′-1½″ x 7′-1″	3′-0″ x 8′-8″	3′-4″ x 10′-0″	3′-0″ x 6′-4″
		Mid.	—	—	—	—	6′-4″ x 11′-3″
		Bot.	5′-0″ x 5′-0″	7′-1″ x 7′-1″	8′-8″ x 8′-8″	10′-0″ x 10′-0″	11′-3″ x 11′-3″
	Total Height		1′-8″	2′-3″	2′-4″	2′-11″	3′-9″
6 Tons per Square Foot	Beams in Tiers	Top	3-9″ x 21# x 3′-10″	3-12″ x 40# x 5′-6″	4-15″ x 42# x 6′-10″	4-15″ x 80# x 7′-11″	4-20″ x 80# x 8′-11″
		Bot.	8-6″ x 12¼# x 3′-10″	8-9″ x 21# x 5′-6″	10-10″ x 25# x 6′-10″	9-12″ x 40# x 7′-11″	10-15″ x 42# x 8′-11″
	Size of Blocks	Top	1′-9″ x 4′-1″	2′-1″ x 5′-9″	2′-10″ x 7′-1″	3′-2″ x 8′-2″	3′-4″ x 9′-2″
		Bot.	4′-1″ x 4′-1″	5′-9″ x 5′-9″	7′-1″ x 7′-1″	8′-2″ x 8′-2″	9′-2″ x 9′-2″
	Total Height		1′-6″	2′-0″	2′-4″	2′-6″	3′-2″

Table 6

Truss Design and Details

PART II. TRUSSED BEAMS

By CHARLES L. SHEDD, C.E.

SOMETIMES when wooden beams are desired they are not in themselves strong enough to carry the load safely or it may be that a stick strong enough would be too expensive or difficult to obtain. If there is room, and if the nature of the structure permits, a wooden beam may in such cases be reinforced by rods trussed underneath as indicated in Figs. 5 and 6. In the case of Fig. 5 the rods are bent under a single post placed under the center of the wooden beam. This is known as a king post truss. In longer spans these rods are bent under two vertical posts as shown in Fig. 6. This is known as a queen post truss.

This is the simplest form of wooden truss to construct but the most difficult to design properly. In a truss of the usual form the stresses may be determined by constructing a simple stress diagram, but in the case of a queen or king post truss such a method would be of no use at all and would give results very misleading which might result in considerable trouble if the truss were built without proper investigation of stresses. To understand the action of a truss of this nature the designer must picture how the truss would look when it had deflected under the applied load. It is evident that in order to deflect the wooden top chord must bend in much the same way as it would if it were a simple beam without the truss rods below. The deflection obviously would not be so great. Therefore there still remains, to a certain extent, the same action in the wooden stick as there was before the rods were used but in addition the rods take tension and the posts and wooden beam are in direct compression just as they would be in an ordinary truss. We must then determine how much of the load is carried by the wooden beam as a beam and how much by the truss as a truss. There are certain formulæ by which the deflection of either a truss or a beam under a given load can be determined. In these formulæ the moduli of elasticity of the materials used form an important part. The modulus of elasticity is materially different for wood and steel or iron. If we take the stress in the post as an unknown quantity, we can divide the structure into its two parts. The wooden beam carries the same load as if it were a simple beam and in addition there is this unknown force being exerted against it in the opposite direction. With these loads the deflection may be determined algebraically in an equation involving the unknown force in the post. Another equation may be formed for the deflection of the truss containing this same unknown quantity and with these two equations, which must equal each other, the amount of this unknown quantity may be determined by simple algebra. In making such an analysis of the truss the designer is making one very important assumption which he must not neglect to appreciate or remember when the truss is erected. This is

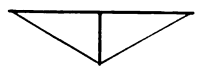


Fig. 5

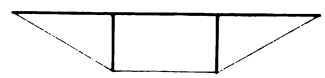


Fig. 6

that he is assuming: first, that there is no deflection in the structure before any load is applied; and second, that the top chord and the truss begin to act simultaneously when the load is applied. It may seem that the first assumption is so absurdly simple and evident that it is no assumption at all, but when we assume that there is no deflection in the structure when there is no load applied it means that the nuts on the rod are not tightened up to such an extent as to cause the wooden stick to buckle up at its center, causing stresses in it and the rods before any load is applied. The second assumption presupposes that the rods are sufficiently tight so that they will begin to act immediately when the load is applied. It may sometimes be desirable to design the structure in such a way that there will be stresses in the members before a load is applied.

The queen post truss involves certain difficulties not encountered in the design of the king post truss. As there are no diagonals in the middle panel it is evident that the stresses in the inclined rods at the ends must be the same and therefore that the stresses in the posts must be equal. This can only be under a symmetrical loading which must be the basis of the design because the queen post truss should be used only in cases where these conditions prevail. In this truss computation the designer writes out equations for the sum

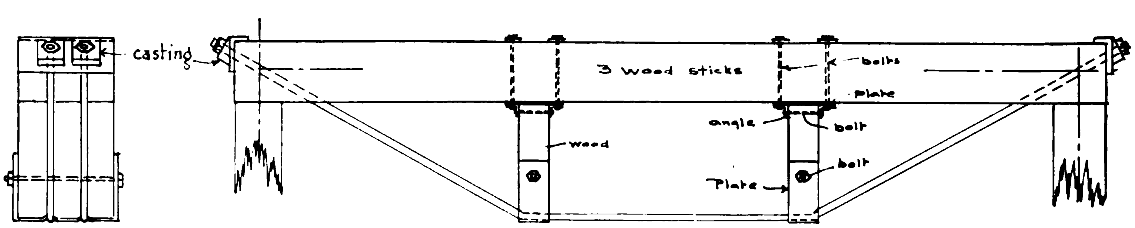


Fig. 7

of the deflections at the two points where the posts occur. These posts may divide the span into three equal parts but this is not necessary nor even, at all times, desirable.

Fig. 7 shows a queen post truss more in detail. The posts are usually made of wood. Between the post and the horizontal stick it is often necessary to place an iron plate. This plate is used in conjunction with two angles and four bolts in order to make a rigid connection. Wood is very much softer in resisting compression across the grain than it is lengthwise of the grain, so if the vertical post were stressed up to its capacity it would overstress the wood of the horizontal stick

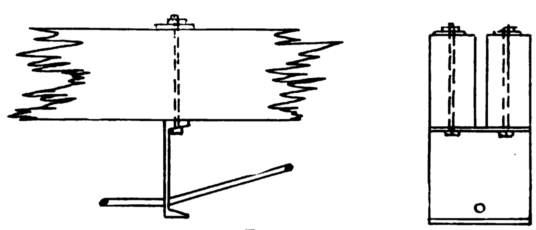


Fig. 8

in bearing, and cut into it. Besides injuring the horizontal stick such action would cause an unnatural deflection in the truss which was not considered in the design. It would not be practical to design a truss to include such a condition and it would further seriously complicate matters.

At the bottom of the posts is shown another plate bent to cover the end and to form a bearing surface for the rods. A direct bearing of a round rod under stress would have a tendency to cut into and split the post. If these plates are bent slightly to form a groove for the rods, the slipping of the rods sideways will be prevented. The bolt through the plate and post serves to hold the plate in position and to keep the post from splitting if the plate bent and dug into the post.

Sometimes the post may be made of cast or wrought iron and in some cases of steel as shown in Fig. 8. At the end of the truss a metal bearing must be provided for the rods against the stick. This may be made of any angle with beveled washers or with a casting. In any event it must be formed of an L shaped piece in order to give bearing against both the top and end of the stick for the two components of the stress in the rods, the horizontal surface for the vertical component and the vertical surface for the horizontal component. These areas will not be proportional to the two components as the allowable stress in bearing on the sides and ends of a stick are materially different as was noted in discussing the bearing of the post against the horizontal stick. In fact it is allowable to use a stress about three times as great for bearing on the end of the fibers as against the sides. It will also be noted that the intersection of the center lines of the horizontal stick and rods is over the center of the bearing.

The end casting should also be thick enough to resist bending as it will act as a beam with stresses in one direction applied by the rods and in the opposite direction applied by the stick. In this particular truss are shown three wooden sticks and two rods alternately placed. It is evident that this arrangement may be varied considerably.

Fig. 8 shows a simple design for a post which has been used by the writer to a considerable extent. It is formed by a short piece of steel channel punched in the web to allow the rods to pass through and in the flange to allow bolts to be introduced which will hold it securely to the wooden stick and assist in preventing it from canting. Such posts, when deep enough, are very cheap as there are always short pieces of channel left over from other work around a shop. A short piece of I beam could also be used.

It is usually desirable to place separators between the wooden sticks forming the top chord. These keep the members in their proper positions and make a substantial and complete structure. They also strengthen the truss against lateral deflection which might be caused in a narrow stick when subjected to too great compression either from bending or from direct pressure. When there is horizontal bending, which is seldom the case, a cast iron separator may be used as shown in Fig. 9 but this is rather more elaborate and expensive than is usually required. An oak block may be used, notched into the main sticks, or even a block of the

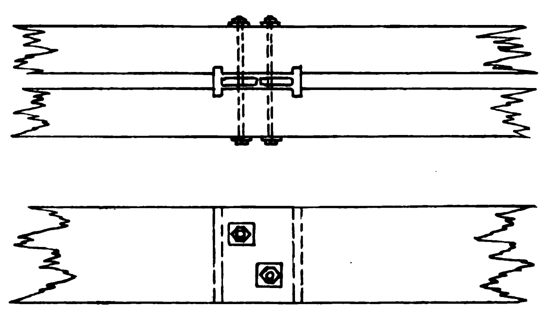


Fig. 9

same material as the sticks depending on the amount of work which the designer expects it to perform.

When the rods are large it is best, in the queen post truss, to introduce a turnbuckle in their horizontal portion. If the rods are small they can be tightened up sufficiently by the nuts at the end unless these nuts are to be covered in. Under such conditions they cannot be tightened conveniently after the structure is built and in case of settlement, due to the seasoning of the timber or to excessive loading, the rods may need taking up. When the turnbuckle is used it is often best to put a horizontal strut between the posts just above the rod. This allows the rods to be tightened without danger of inclining the posts.

Early American Domestic Architecture

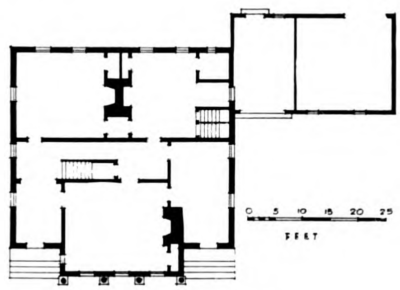
IV. THE JESSUP HOUSE, WESTPORT, CONN.

MEASURED DRAWINGS BY OLIVER REAGAN

EIGHTEENTH century New England builders were successful in obtaining surprising results with a limited number of the simplest motifs. The old houses in the lower part of Connecticut, for example, show the use of only a few types, but within these narrow and restricted limits the old designers—many of them carpenter-builders — produced buildings of great interest, which are as beautiful today as when they were first built.

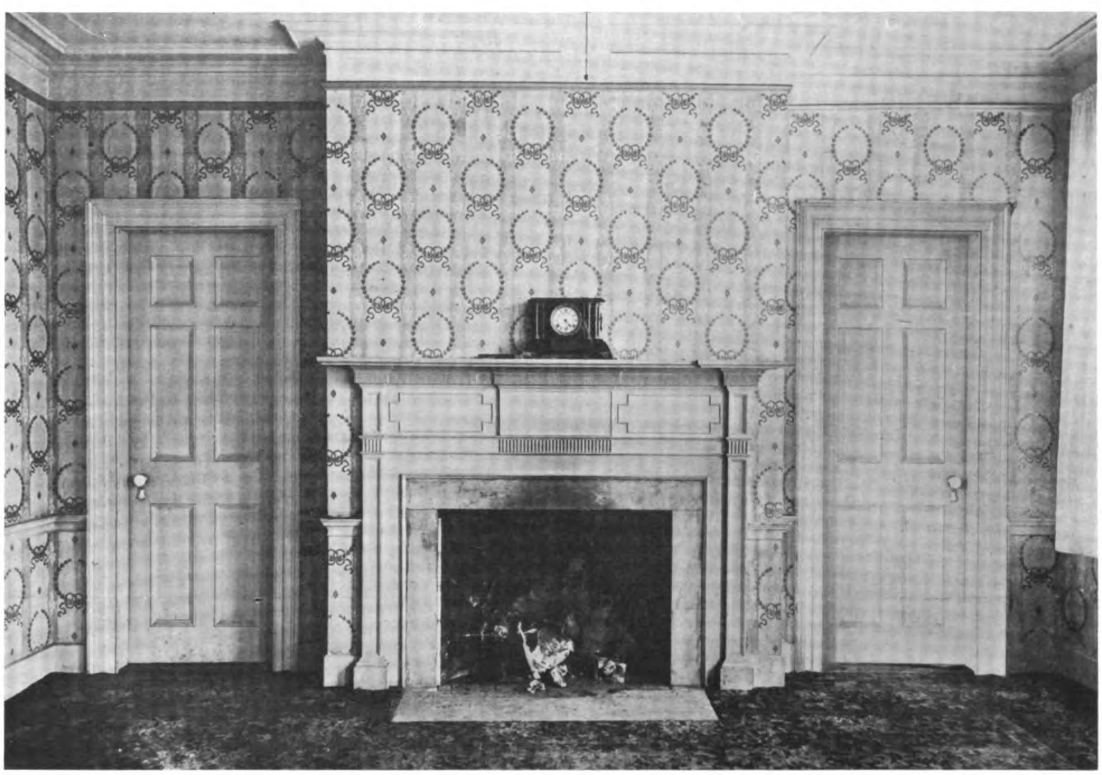
Occasionally, however, the builder departed somewhat from a strict following of any one of the few forms of building which were in vogue. The Jessup house, at Westport, built about 1780, affords an instance where the designer varied considerably from the use of any of the accepted types. He seems to have felt the need of symmetry, nevertheless, and the form of the house, while irregular, retains a certain degree of definite, formal balance.

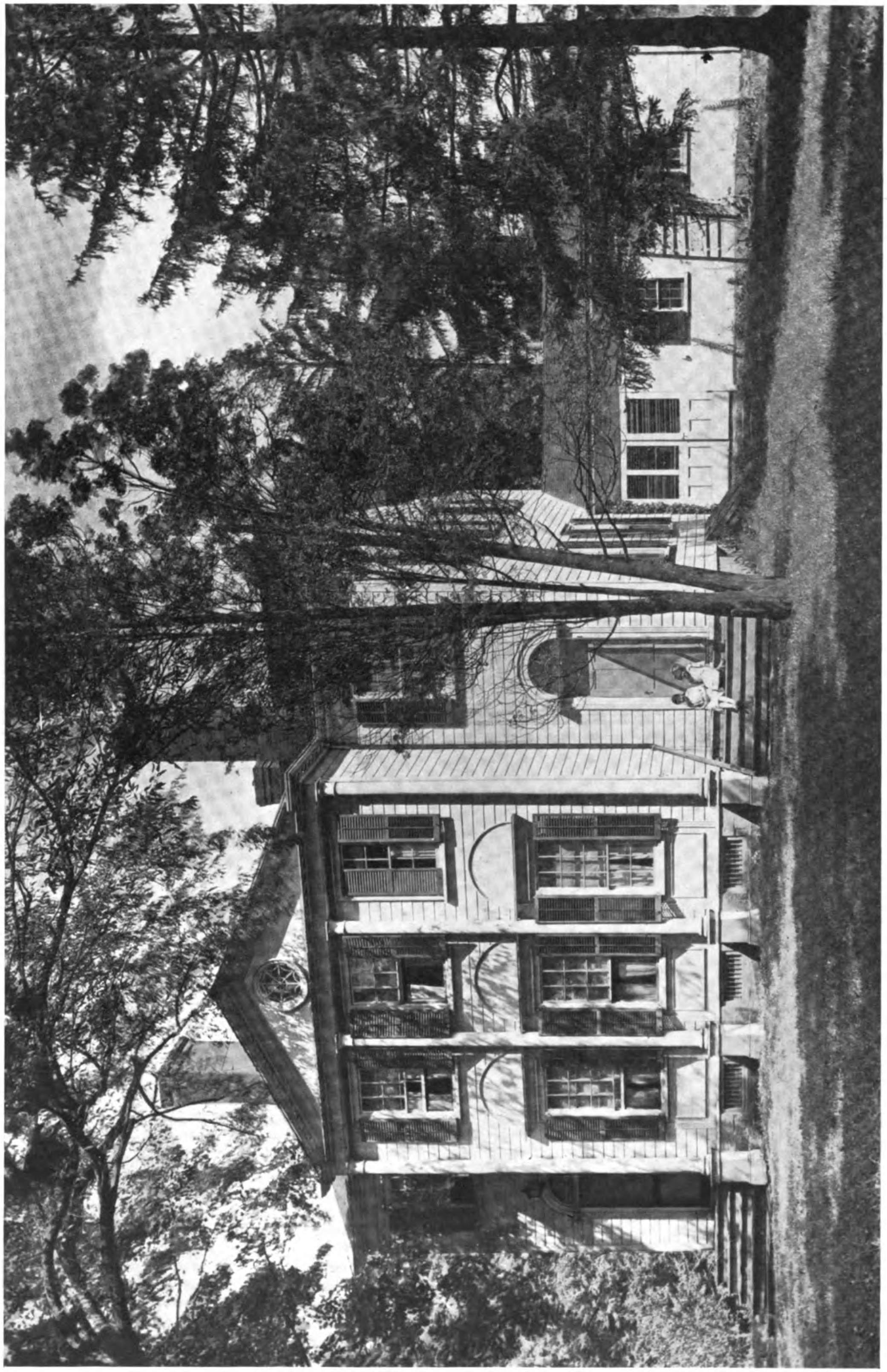
Here the house has a gable end at the center of the building which is flanked at either side by an abbreviated wing with a hip roof. While there are two entrances neither one is placed in the gable end of the house but one in each of the wings. The designer has made the doors very simple and restrained that they might detract in no wise from the architectural interest and decorative importance of the central gable end.



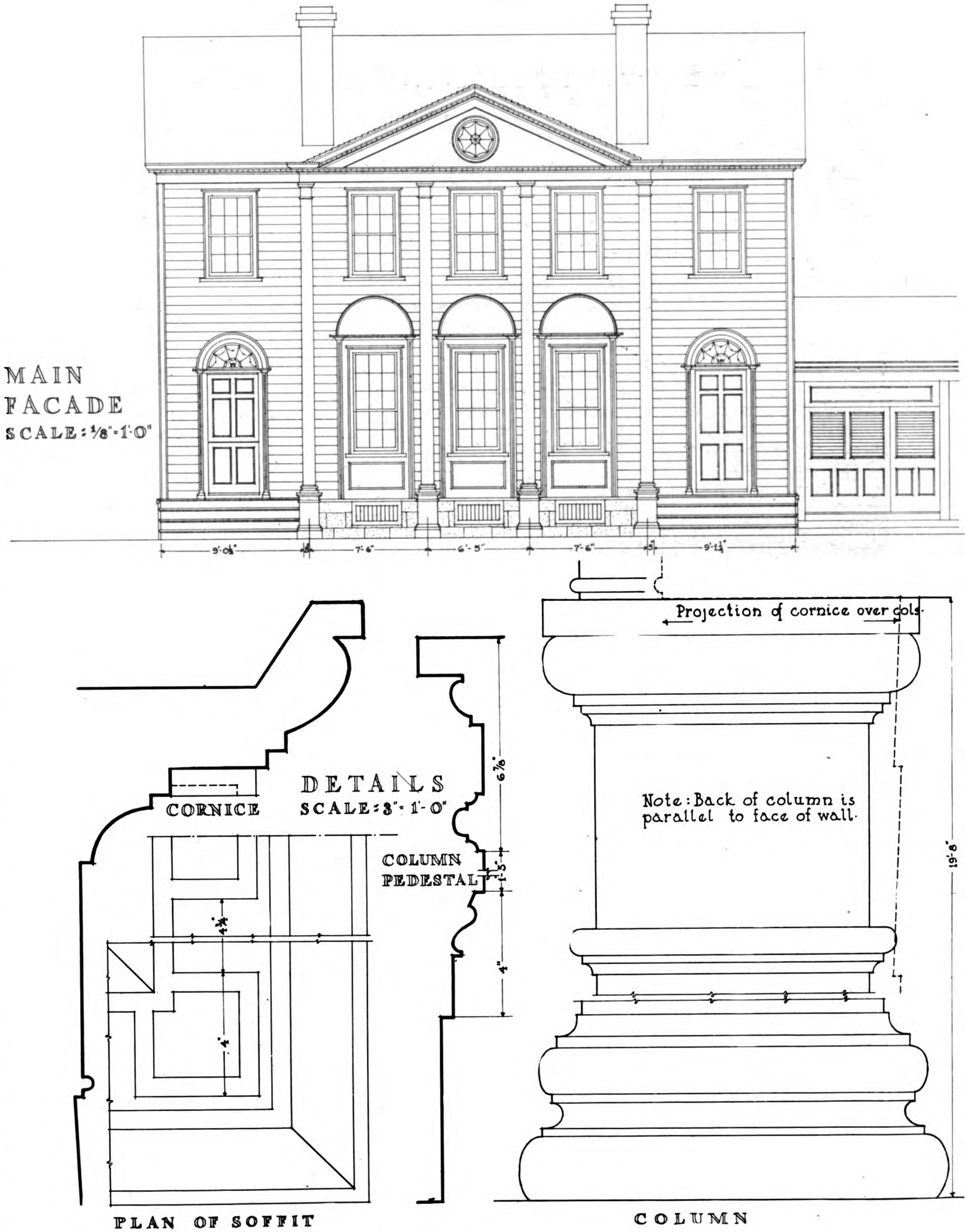
Plan of Main Floor

The slenderness of the engaged wooden columns emphasizes their purely decorative function and the bases of the columns, the sunken arches over the lower floor windows and the semicircular panels which they enclose—plain surfaces made of flush boards—illustrate the manner in which architects of the period adapted to wood construction forms usually identified with the use of stone or brick. These houses depended for their beauty upon two things: proportions carefully studied and excellent detail very sparingly and thoughtfully used, which produced an effect of dignified simplicity.


Detail of Principal Room or Parlor

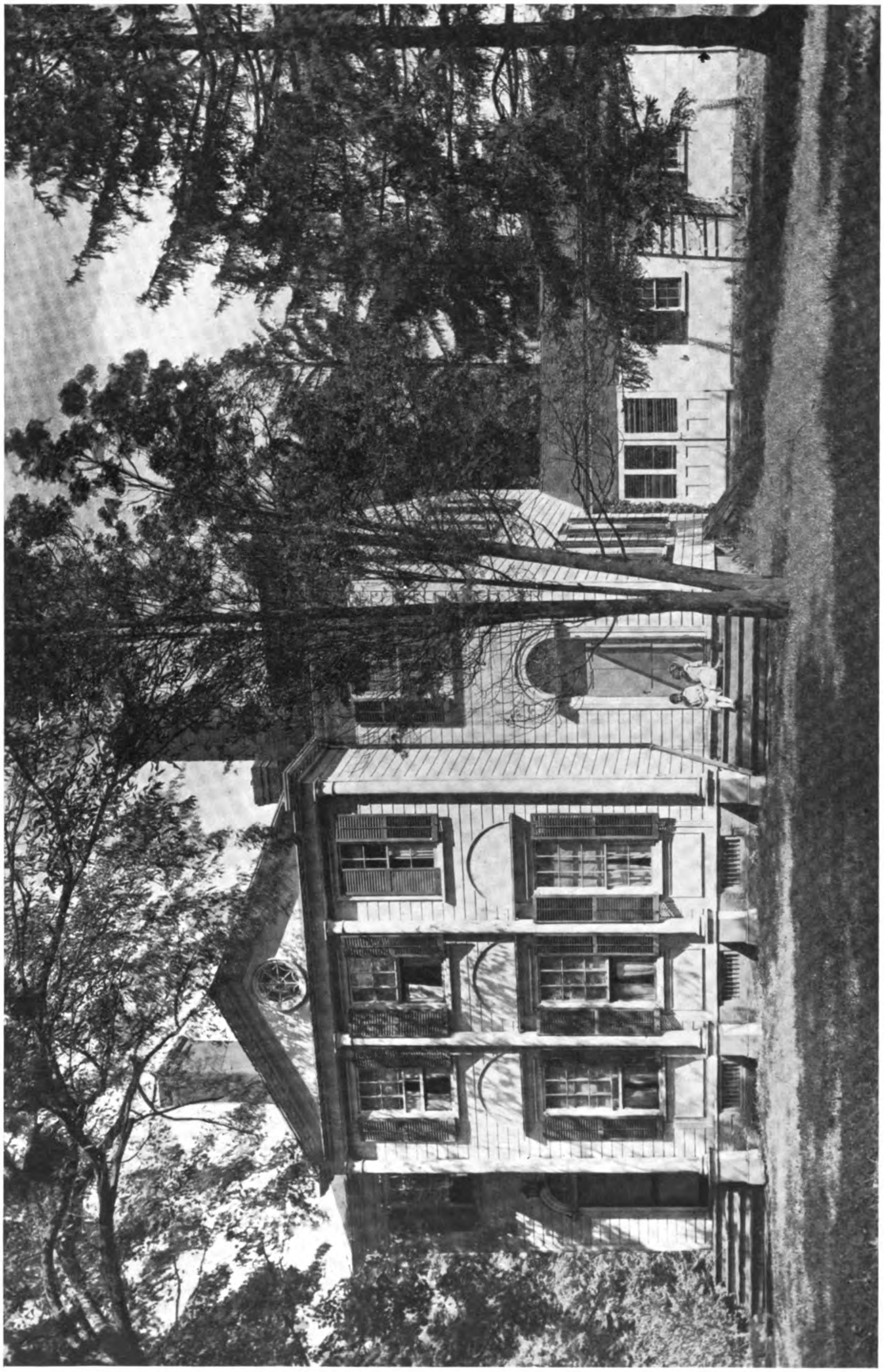


VIEW OF MAIN FRONT. THE JESSUP HOUSE, WESTPORT, CONN.

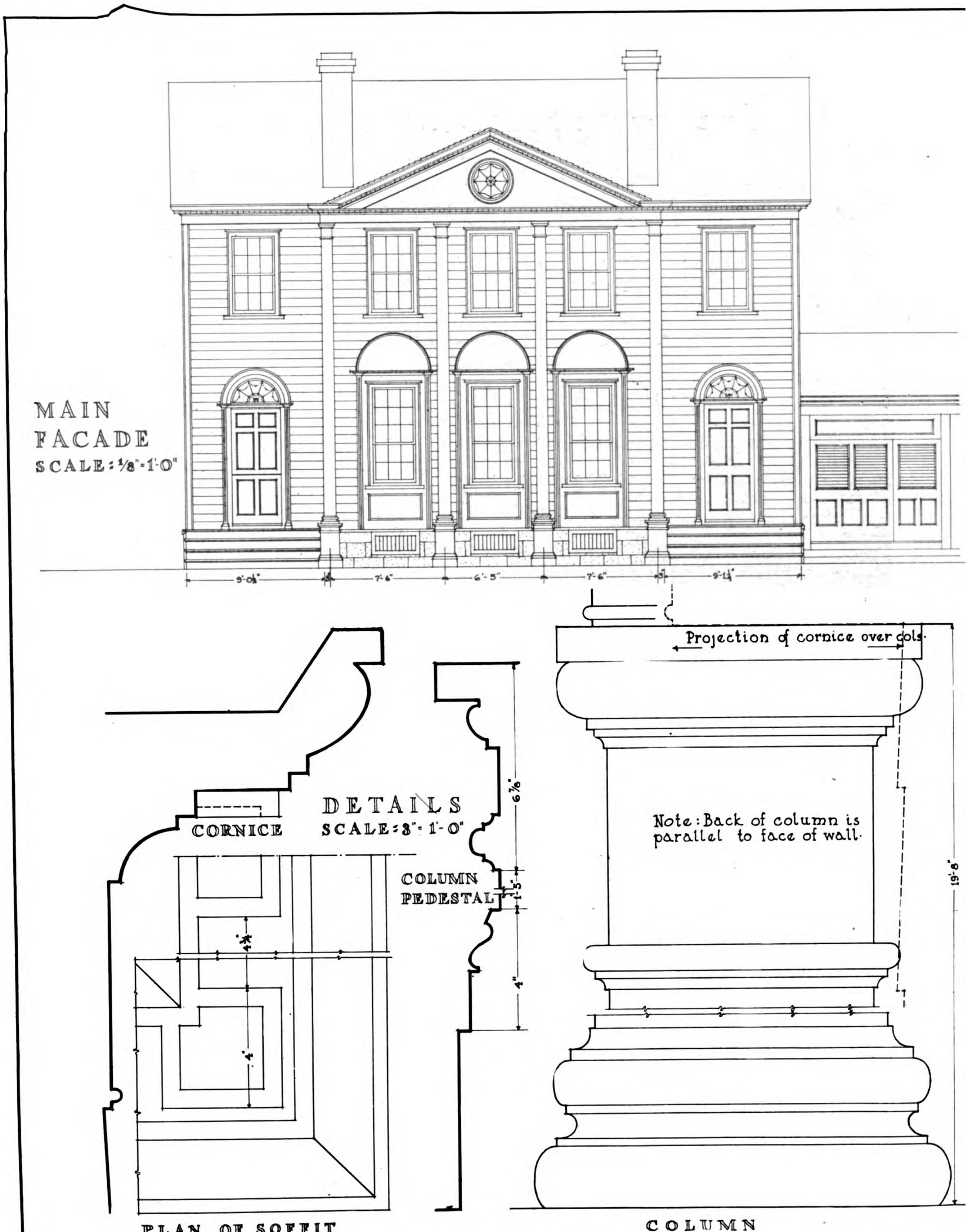


THE JESSUP HOUSE, WESTPORT, CONN.

MEASURED AND DRAWN BY OLIVER REAGAN

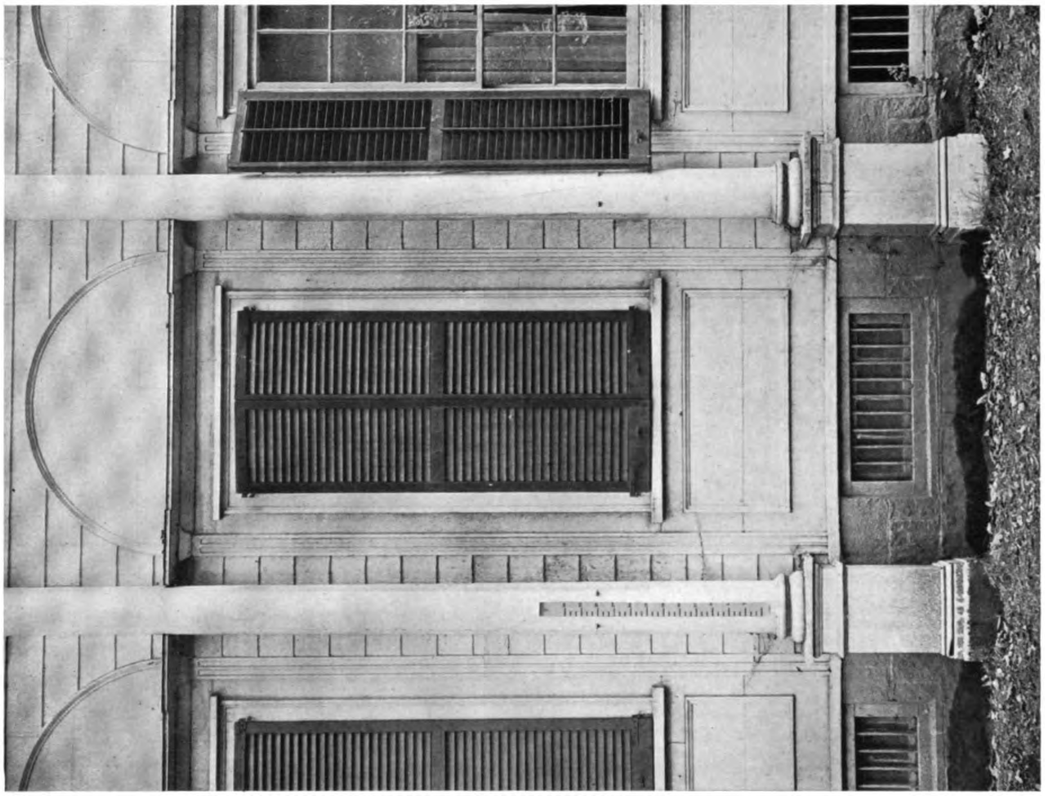


VIEW OF MAIN FRONT. THE JESSUP HOUSE, WESTPORT, CONN.



THE JESSUP HOUSE, WESTPORT, CONN.

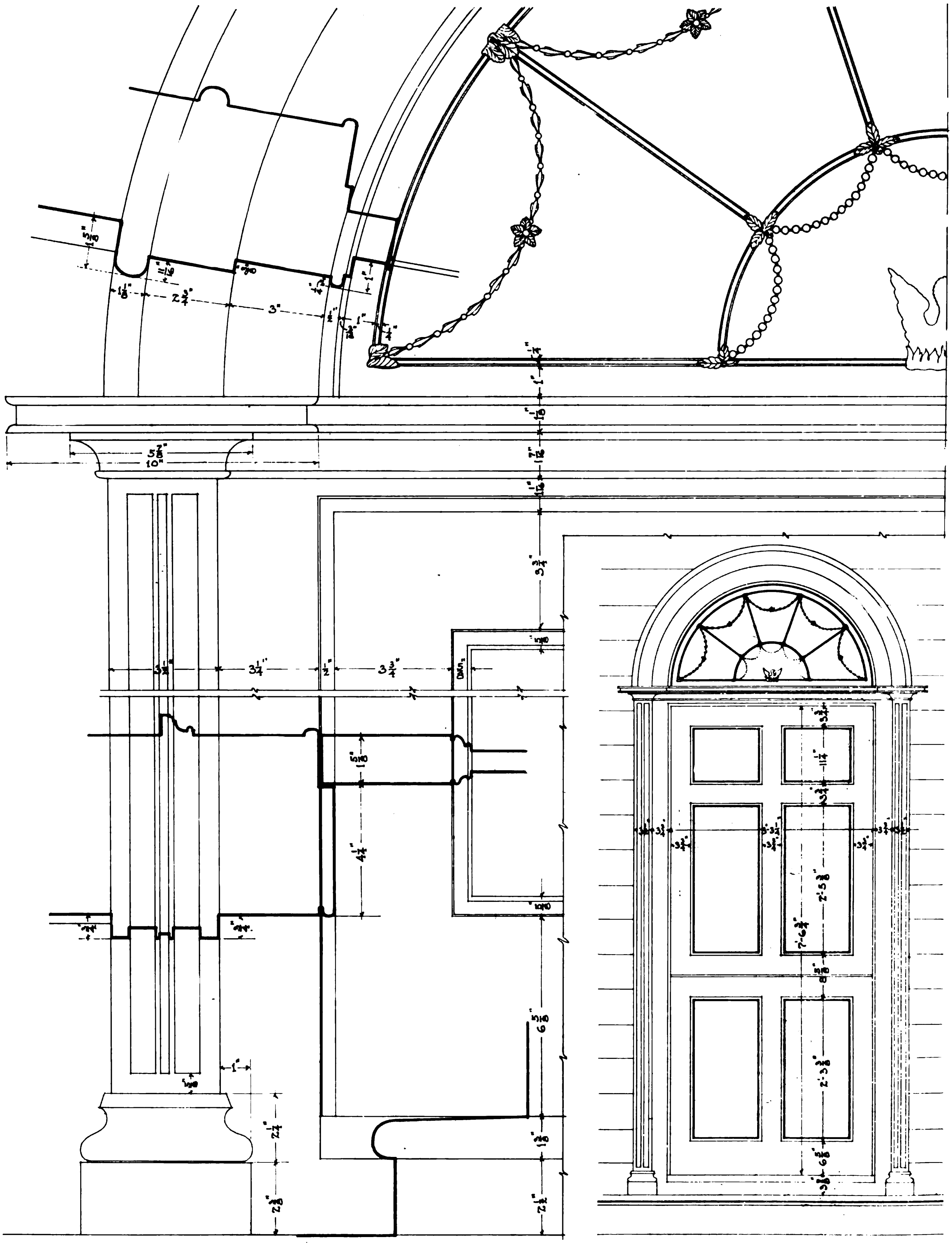
MEASURED AND DRAWN BY OLIVER REAGAN



DETAIL OF LOWER STORY

THE JESSUP HOUSE, WESTPORT, CONN.

DETAIL OF ENTRANCE FRONT

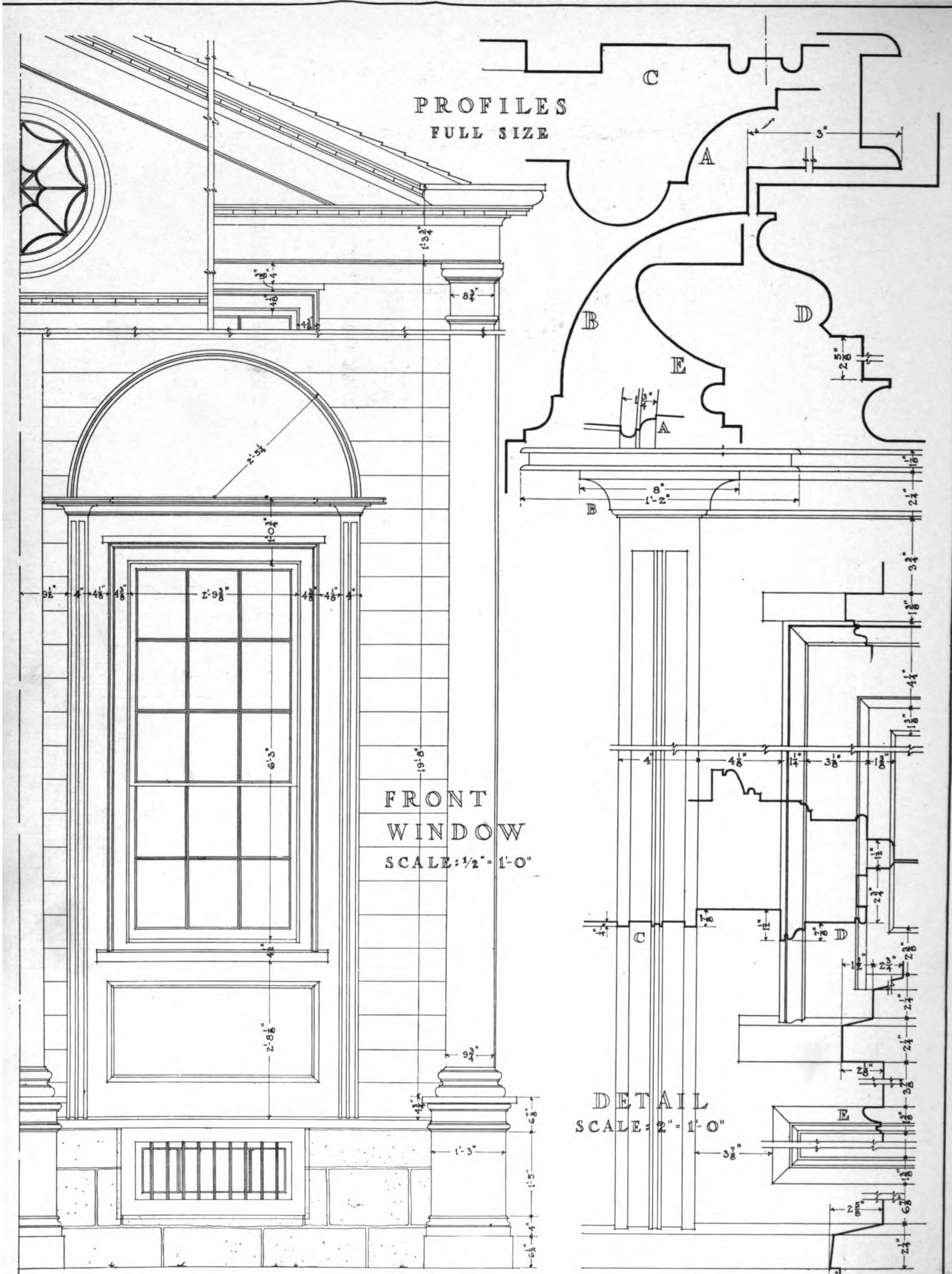


DETAIL
SCALE: 3" TO 1'-0"

FRONT ENTRANCE
SCALE: ½" TO 1'-0"

THE JESSUP HOUSE, WESTPORT, CONN.

MEASURED AND DRAWN BY OLIVER REAGAN



THE JESSUP HOUSE, WESTPORT, CONN.

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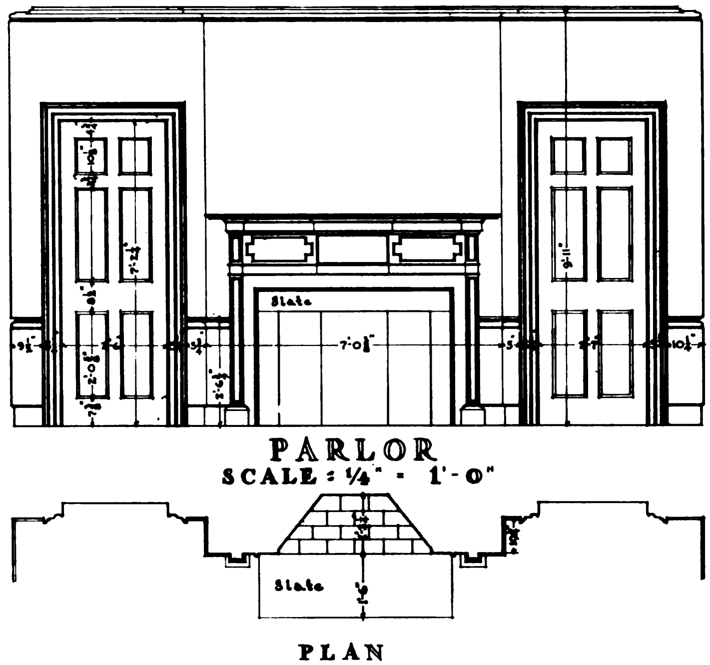

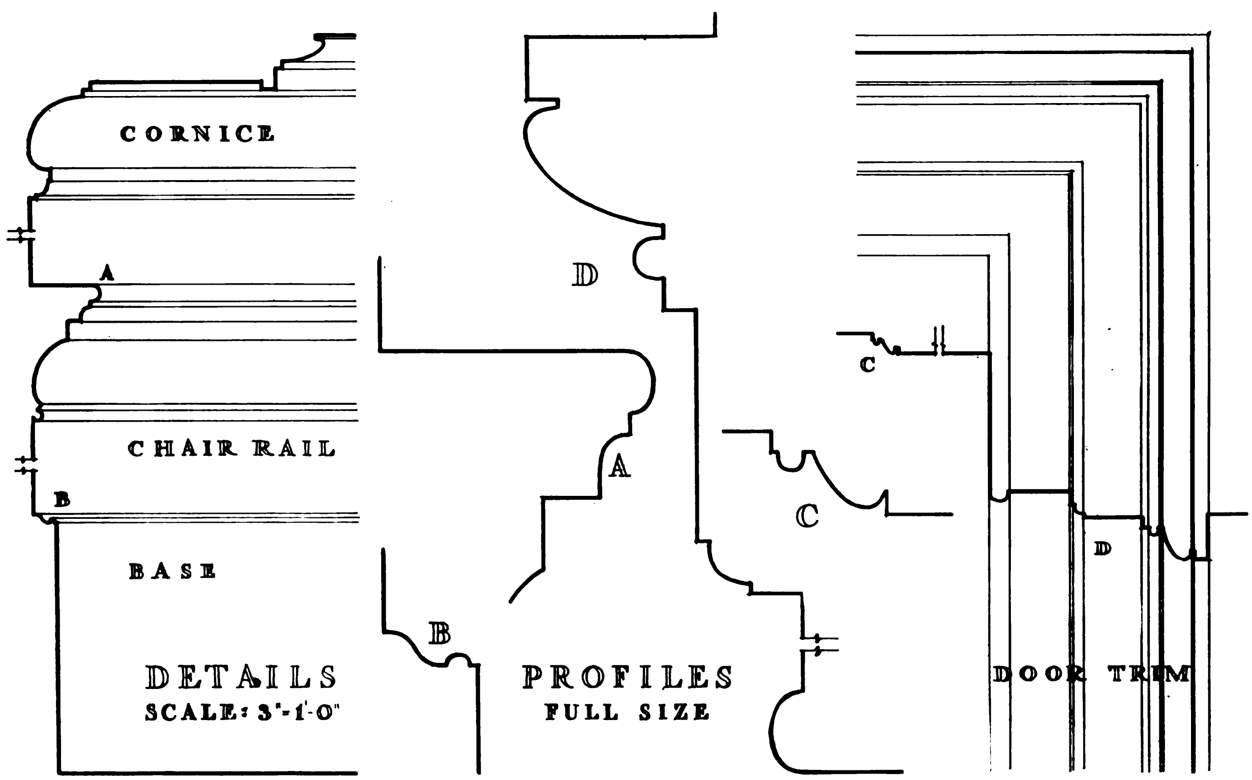

THE JESSUP HOUSE, WESTPORT, CONN.

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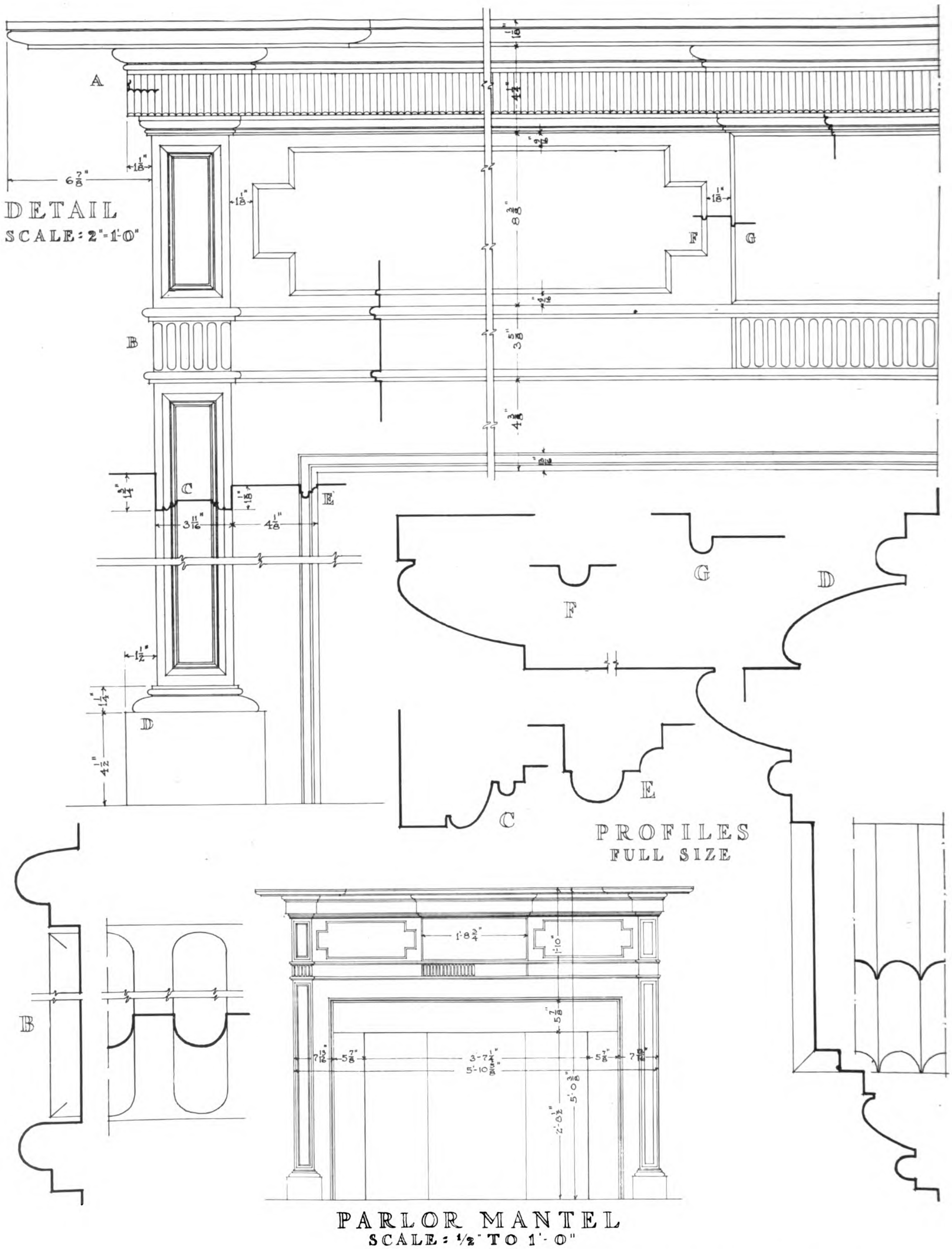


THE JESSUP HOUSE, WESTPORT, CONN.

MEASURED AND DRAWN BY OLIVER REAGAN

C. STANLEY TAYLOR, *Associate Editor*

The Placing of a Cost-Plus Building Contract

PART II. RELATIONS OF ARCHITECT AND CONTRACTOR WHILE WORK IS UNDER WAY

IN the November issue of THE FORUM, under this heading, the question of a form of contract was discussed. It is assumed that the type of cost-plus contract under which the average work will be carried out will not be other than that known as the fixed-fee contract or fixed-fee with penalty and bonus clause. At this point an analysis of the difference in relationship between the architect and contractor under the lump-sum and fixed-fee types of contract will prove of interest as having a bearing upon the type of organization and method of supervision necessary from the architect's standpoint.

While it is true that a lump-sum contract apparently removes responsibility as far as ultimate cost of the building is concerned, this is not often the case. In the first place, in any large building operation there will of necessity occur certain changes in plan, corrections of omissions and other details which may legitimately be classed as extras by the contractor. The total cost of these extras cannot well be estimated and it is a well known fact that practically all lump-sum bids have definitely in view the possibility of extras on which the contractor will receive a percentage.

From the very beginning of a lump-sum contract, therefore, even with the most reputable contracting firm, there is a constant actual or potential state of friction between the architect and the contractor. The interpretation of specifications offers many points of disagreement, and delays on the job which may not be the fault of the contractor are often not readily understood by the architect. In many instances the architect is called upon to arbitrate between the sub-contractor and the contractor. If, for some reason, the contractor may fail to approve a sub-contractor's work or fail in payments to him, a lien is placed upon the building. In other words, when a contract is placed upon a lump-sum basis the architect and contractor are not working in harmony for the benefit of the owner. The contractor is working for his own benefit, to protect his own factor of profit in the figure which he has quoted as the total cost.

The architect, under the straight contract, is not getting the benefit of close co-operation with the contractor. Consequently he is placed in a position where he must watch out not only for the quality of construction, and of materials, but he is in addition working with an unknown quantity as far as the contractor's attitude may be concerned. He has no careful cost record available. He is not certain at what point the contractor may be in danger of losing money—a time when the natural force of self-protection may develop an acute crisis in the relations of the contractor, the architect and the owner.

One of the definite penalties of the lump-sum contract, which has involved considerable loss to owners, is the element of time. While a time of completion may be set in the contract there are many loopholes, and—judging by the average case of this kind—when the contractor reaches a point where he sees no profit in the job he will not exert himself to finish the work rapidly.

There are many other obvious and familiar points of disadvantage in connection with a lump-sum form of contract on large operations, particularly under unusual material price and labor conditions. (The statements made here are relative to large projects only and do not constitute an indictment of the general contractor but of the lump-sum method of letting contracts on large work.)

On the other hand, the relationship which is developed under the fixed-fee form of contract is one which should tend directly to the benefit of the owner. Under any given set of conditions affecting a building operation it is evident that there is a minimum cost from the owner's point of view. The question is—how can this minimum cost be most nearly approached in actual figures? It is logical to believe that the most satisfactory method might be:

1—That an architect be selected and sketch plans drawn and approved.

2—That before going into working drawings and details, a decision be made as to the form of contract under which the building will be constructed.

3—That if it is decided to take advantage of a fixed-fee form of contract, a contracting organization be selected in order that an experienced contractor may be available to the architect in the course of preparing working drawings, details and specifications.

4—That when building operations have commenced the architect and contractor will ally their efforts, each in his own organization, to buy materials and equipment at the lowest possible market prices, to arrange sub-contracts in a manner mutually satisfactory for the owner's benefit and to carry out and expedite the work with integrity.

Certainly, many architectural offices are so completely organized in personnel and departments that they have no particular need of the advice of the general contractor in the course of developing plans and specifications. On the other hand, we may frankly say that many large building operations have been planned under conditions where the practical advice of a good general contractor would have resulted in the saving of considerable money for the owner. It is interesting to note that B. W. Morris, architect of the Cunard Building in New York, in describing the architectural development of that building in THE FORUM for July, 1920, said: "It is the writer's experience that the best possible results are secured when the builder, experienced, competent and honest, is appointed at the same time as the architect."

Turn now to the actual relations between the architect and the contractor. As the work proceeds under a cost-plus-fixed-fee contract, we may consider for a moment the inter-related functioning of the two organizations. The contractor is directly charged with the purchasing of materials according to specifications, the hiring of labor, the direction of work in the field and, usually, the provision of necessary construction equipment, probably on a rental basis. The architect is called upon to approve purchase orders for materials and equipment, to check the progress of work from the view point of elapsed time as compared to estimated time,* to inspect the quality of work, to approve any sub-contracts which may be placed and, in brief, to consider himself in the position of the man who is investing money in this building. That the relations of the architect and the contractor may be harmonious is practically guaranteed by the fact that they are working for a common purpose—the benefit of the owner.

It will be seen, therefore, that the architect's organization should include a field superintendent (usually an engineer) who will act as the architect's representative, and who is on the job not to act against the contractor's interests but to aid in every possible way with practical suggestions during the progress of the work. On a job, this resident engineer will probably need an assistant who, as a general utility man, will develop progress reports and act as expediter and follow-up man where there may be delays in the delivery of material. In the architect's office there should be an estimator who has had considerable experience in purchasing. As purchase orders for requirements may be brought in by the contractor it is the duty of this man not only to check prices but to offer any suggestions which he may have in regard to materials available for quicker delivery or at lower cost. On the job progress records will be kept by the contractor and in duplicate form by the resident engineer representing the architect, so that a cost and time check may be kept and additional pressure put upon portions of the work which may be behind.

It will be seen, therefore, that the architect, through the members of his organization, should have a thorough knowledge of available materials, equipment and methods; that he should have in his organization capable resident engineers, estimators and experienced purchasers. The contribution of the architect to the success of a building is:

1—In designing a building which is efficient in purpose and economical from the view point of building cost.

2—To be able to check the work as it progresses in order to offer constructive suggestions and assistance.

3—A readiness in understanding the view point of the practical builder, in order that changes in details or specifications may be made quickly to meet any unusual condition which may arise.

Under the fixed-fee contract, a contractor has not even a theoretical reason for increasing cost or delay, but has every incentive to carry out his work in a manner which will bring strong approval and recommendation from the owner. While the architect is not relieved of any responsibility under this method of contract, he takes on only the additional responsibility which is represented by a more intimate knowledge of the building business—knowledge entirely desirable from his view point.

It is important to realize, however, that the architect, under the fixed-fee type of contract, where relations are developed with a reputable organization, avoids the unpleasant type of supervision which is involved in the case of the lump-sum contract. In other words, under the straight contract the architect and contractor usually develop into the position of "friendly enemies" because the actual interests of both are so distinctly separated. It is well to realize also that during past years there have developed certain contracting organizations which are highly professional in their method of rendering service. Skilled in the difficult details of hiring and superintending labor, equipped in personnel with experienced engineers and field superintendents and having behind them a long list of satisfactory contracts carried out for owners on a service rather than on a lump-sum basis—such organizations are quite similar to architectural organizations in their professional relations with the owner or his representative.

It is evident, therefore, that an architect who, in conjunction with the owner, is about to place a building contract, has his choice of two types. One is a straight contract in which he asks the contractor to buy quantities of material and necessary labor, combine them and sell to him the total result for a definitely estimated and guaranteed price. Unfortunately he cannot see the article which he is purchasing and it may be that the buy will be a good one or a bad one—in accordance not only with the purchase price but with the varying fortunes of the building contractor who makes a definite bid involving many conditions beyond his control. On the other hand, the architect may purchase for the owner the service of an organization which he may analyze by its performance, by its personnel and by the integrity of its approach in developing business relations with him.

* See articles, "Progress Schedules," by C. A. Whittemore, THE ARCHITECTURAL FORUM, Jan.-Apr., incl., 1916.

Sound Reasons for Optimism

THE fundamental business conditions of the United States are of direct interest to architects and all other business men in the construction industry. We have had many indications of troubled business conditions, such as the falling of prices in many commodity lines, a slowing down of interest in building construction, and similar effects of present unsettled conditions. It is interesting and encouraging, therefore, to consider a recent statement by Charles H. Sabin, President of the Guaranty Trust Co. Every architect should read this statement carefully and give it due importance in his consideration of future business conditions:

"There are some important considerations which should be borne in mind in the present situation by all who seek to analyze it accurately.

"In the first place, there is nothing mysterious or unexpected about the present condition in either the commodity or security markets. For months it has been certain, and it has been repeatedly so stated by students of the situation, that there must be a liquidation of commodities, securities and labor before this country could fully recover from the effects of the war and be restored to anything like a normal business basis. It was inevitable that the processes of readjustment should be painful in many respects and in many instances, but that they were and are inevitable was a matter of common knowledge among all who seek to study these problems apart from immediate self-interest. The regrettable thing is that, as commodity and security prices reached points far above their real value in the boom period, so they are today falling to points far below their real value. Necessary liquidation is proceeding after the manner anticipated, on the whole, but there are yet several steps to be taken.

"Perhaps the most important of these is for retail merchants to realize that they too must meet the inevitable economic trend and adjust their prices to meet new conditions. Only in that manner can the situation be stabilized and frozen credits thawed out. I know this is not a pleasant message, but I am firmly convinced that the sooner such a policy is pursued, the less costly and painful it will be to all concerned. The process of deflation must include all the elements in the body economic sooner or later and there can be no escape from the inexorable law which directs it. Dodging the facts or attempting to postpone the inevitable will not bring immunity to anyone, whether his interest lies in production or distribution, capital or labor.

"The unfortunate effect in such a situation is always that many innocent parties are made to suffer through ignorance and misunderstandings and also through the spread of false and malicious rumors which such conditions always inspire, with a resulting loss of confidence and panic sales.

"There is so much in the present situation to inspire confidence and hope for the future that it is little short of criminal for anyone to paint the picture so blackly, through either ignorance or intent, that these vital facts are obscured. There are many pertinent facts. This country has harvested this year one of the largest crops in its history; its transportation congestion has been relieved and its railroad system is for the first time in a decade on a sound financial and operating basis. We have passed through a national election and are assured four years of sane administration of public affairs. Our banking system has withstood the greatest credit strain in its history and is on a sound and workable basis; the accumulated surplus of five years of splendid prosperity is stored in many ways for our continued use; the markets of the world demand our products and a great mercantile marine is prepared to transport them. This country has not been overbuilt or overextended in any of its underlying activities, and faces no program of readjustment along these lines such as usually precipitates panic conditions. We are in a sounder financial, industrial and political condition than any important nation in the world.

"These are the simple, fundamental facts of our business situation, and to consider the present reaction as anything but a temporary setback from the destruction, inflation, extravagance and unsound economic conditions precipitated by the war is simply not to reckon with the truth. It remains true today, as it has since this country was first settled, that any man who sells the United States of America 'short' is in the long run certain to lose and, furthermore, any man who seeks to profit by the misfortunes of others in the circulation of mis-statements or false rumors, hoping to precipitate further reactions, should be branded as a public enemy.

"This is a time for clear thinking and courageous acting, and in the proportion that such factors are brought to bear will rewards follow when this spell of reaction has run its course."

It is of course difficult to analyze to any satisfactory degree the activity which may be expected in the building construction industry during the next year. In considering this question, however, there are certain fundamental conditions which may have definite significance and from which we can draw certain conclusions. These are:

1—That the shortage in building construction, to reach again a normal supply, represents an expenditure of approximately $4,500,000,000.

2—That the approximate expenditure required normally is close to $1,000,000,000 annually.

3—That with index price of the bond market rising, and in view of the withdrawal from the market of many attractive investment issues, there is a definite tendency on the part of the public to turn again to real estate mortgages as a sound form of investment.

4—That architects everywhere are reporting a slight increase in business and that all conditions indicate that 1921 will prove an active year and the first year of extended building activity.

5—That the classes of building in which greatest activity is expected are:

(*a*) Housing of every type, including dwellings and apartment houses—a large proportion of the expenditure to go into apartment house construction.

(*b*) Office structures and various utility buildings.

(*c*) Buildings for educational, amusement and similar enterprises.

You ask directly regarding the effect on business of low crop, raw material and commodity value conditions. The effect of these conditions on the building industry may be readily approximated.

The present inactivity in the building field is largely due to the fact that the public confuses building materials with commodities such as woolen goods, cotton goods, silk, shoes, etc. Having seen a definite price reduction in these fields, the public expects to see the same thing happen in the building industry. It cannot happen to a similar extent, however, for the reasons that there are no supplies of building materials on hand and that the building material field has not yet definitely felt the general labor reduction.

Undoubtedly, building material prices will stabilize on lower levels than heretofore but not as low as present prices. This is evidenced by the present inclination of dealers not to accept orders calling for definite future delivery dates that run beyond February or March, 1921. We find from many architects' offices that they have been advised to hold up plans until next spring to see what happens in the material market. When it is found that there is no great reduction in prices a large volume of work will proceed. It is true that there will probably be a reduced labor cost in actual construction but this will tend only to increase the volume of business.

If we consider these facts along with the growing inclination to invest in building loans and real estate mortgages, it is evident that we may safely anticipate a period of several years' activity in our industry. The first activity as shown next spring we are certain will be a definite attempt to meet the present shortage in building loans and the force of economic conditions tending toward a lowering of prices will re-enforce this activity to maintain at least its normal stage with some attempt to take up the slack.

The Question of Standardizing Building Codes

WE are interested in hearing from architects in every section of the country regarding the question of building code standardization. We have had several letters on this subject recently, among them being one from a Buffalo architect from which we quote briefly:

"I am interested in 'high cost of building.' One way to lower the cost is to revise our building laws; for instance, the live load in an apartment house in Milwaukee is 30 pounds to a square foot. The Buffalo requirement is 70 pounds to a square foot—more than twice. Why should that be? As regards live loads for various buildings, the requirements should be uniform. This is a subject I would like to see taken up in THE FORUM."

Our correspondent has touched upon a subject which is of great importance not only to architects but to contractors and building material manufacturers. There is no doubt that the general requirements of the average building code have not been scientifically determined. Very often these requirements necessitate an excess expenditure in certain classes of buildings which is frequently as high as 30 per cent.

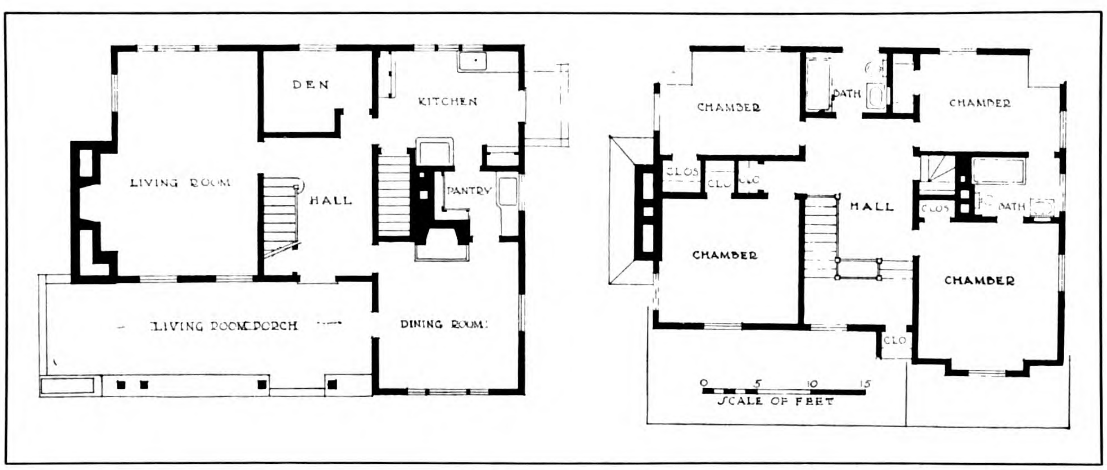
Building laws and building codes are necessary in order to insure public safety and to safeguard loaning interests. On the other hand, it is not logical to find so great a variance in the requirements enforced in various cities of approximately equal population. Certainly there must be many requirements in building codes having distinctly local application, but it seems entirely possible that a standard code can be developed which would have application according to the population grading of cities and it could be used as the nucleus for the development of all local codes. This would mean that the writing of such a code would be based upon engineering knowledge rather than on political preference, and that in many instances the amount of money necessary to invest in building construction would be noticeably reduced per cubic foot, a condition which will be highly desirable during the next few years.

The need of standardization of building codes was recognized some years ago by the insurance interests and a standard for large cities and for towns was developed by the National Board of Fire Underwriters stressing, of course, the protective measures from an insurance view point.

Practically all architects who have been called upon to design large structures, and particularly those whose work has extended to other cities, have had unpleasant experiences in connection with building law and code regulations. We would appreciate letters from architects who have had such experience in order that a definite basis for further consideration of this matter may be established.

A Small English Country House at Hartsdale, N. Y.

CARETTO & FORSTER, ARCHITECTS



FIRST AND SECOND FLOOR PLANS

EDITORIAL COMMENT

JOINT REGISTRATION LAWS

CONSIDERABLE confusion has existed with reference to the form of state registration laws for architects since the adoption of the Institute's model law by the 52d Convention in 1919, due primarily to objections raised by engineers to one of the articles which they maintain would prevent their designing buildings even under the appellation "engineer."

The meeting of the Council of Architectural Registration Boards held November 18 and 19 in St. Louis brings the matter to the fore again and, owing to the fact that the respective interests of architects and engineers in registration laws will be considered at the next Institute convention, the comments expressed at the St. Louis meeting have a special interest.

In the first place, and for the purpose of recalling the progress of recent events, it may be stated that the contention of the engineers represents a misconception of the Institute's recommendation—it is not the intention of the model law to confine the preparation of drawings and specifications for the construction of buildings or of their superintendence to architects; it only denies the right to use the title "architect" in any form to anyone not recognized as an architect by the state. An ambiguity in the phrasing of the article undoubtedly gave rise to these objections and we understand that the present Institute Committee on Registration Laws has redrafted the section to express more clearly the intention of the Institute.

The effect of the opposition, however, resulted in a joint registration law prepared by a committee of Engineering Council. In view of the objection to joint laws voiced at the 52d Convention a conference with the Engineering Council committee was sought and a joint committee of the two bodies resulted, the architect members of which are Ernest J. Russell, Wm. P. Bannister and John Donaldson. This committee held meetings this fall and agreed upon a form for a joint registration law which is now on the press. Approval of the committee's work was obtained of Engineering Council but, due to the expressed opposition to joint laws by the Institute in convention, the report is referred to the regular Institute Committee on Registration Laws which will bring it before the next convention for final action on the part of architects.

The Council of Architectural Registration Boards is composed of officers of the registration boards of most of the states which now have registration or licensing laws. The estimate of these men of the worth of joint laws, therefore, holds weight because it is based on actual experience. It is interesting to note that all present, including a number from states having joint laws, expressed themselves as opposed to joint registration.

The directors of the departments of registration of the states of Illinois and Idaho who perform the executive secretarial work in their states for the Boards of Examiners of doctors, dentists, nurses, pharmacists, engineers, architects, etc., expressed decided views against joint laws. They gave as their opinion that if registration were placed under the jurisdiction of the departments of education of the states, as in the states of New York and Illinois, separate laws may be fully as economically administered as joint laws and that they, further, are more easily supported and enforced by the courts.

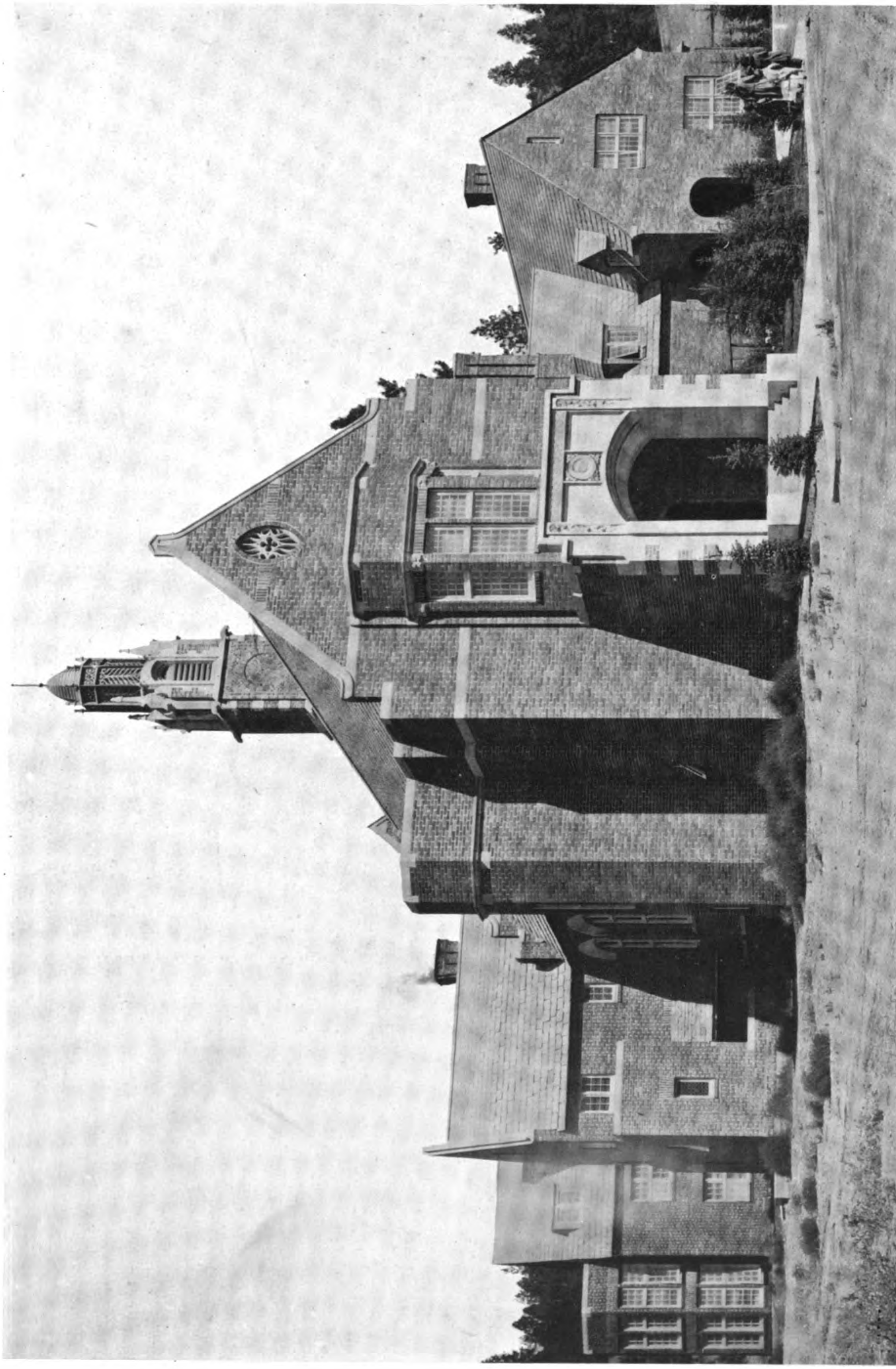
Economical administration of the law should not be a governing consideration because in a matter so vital to the welfare of the public small economies have no importance. As a matter of fact such economy would undoubtedly only be noticeable in those states in which there are few architects and engineers, and the proposed joint law defeats to some extent any possible economy by requiring seven to nine members—three or four architects, the same number of engineers and one surveyor.

The result of the discussion of this subject by the Council was the passage of a resolution "that a joint registration law for architects and engineers is undesirable."

The Board of Directors of the Institute met also in St. Louis on the day following the meeting of the Registration Council. Every member of the board expressed himself in favor of the friendliest co-operation with the engineering profession, especially in obtaining harmonious separate laws that will permit both professions to practice without interference.

This is the attitude that careful consideration seems to dictate as the most intelligent and most certain of insuring fairness to both professions. While the work of the professions to a certain extent lies along similar lines, and in fact frequently overlaps, there are important fundamental differences in the training for the respective professions that make it difficult to establish one set of conditions that will fairly govern both. There is, however, every reason why a very real co-operation should exist between the professions and especially in the matter of legislation affecting them; this co-operation will be most effective, however, when directed toward establishing a correct understanding of their mutual aims and functions, and on that basis there will be no difficulty in adopting separate registration laws that will insure harmony and fairness.

A necessary further step in registration is uniform regulations which will permit of reciprocity between states, now only possible to a small extent and by virtue of the latitude invested in the examining boards in conducting examinations. The existence of the Council of Registration Boards should be an influence in improving this condition and it will undoubtedly be able to devise a standard examination. In this connection it may be noted that a similar body of the state engineering examiners was formed in Chicago on November 8 and 9 and named the National Council of State Boards of Engineering Examiners.



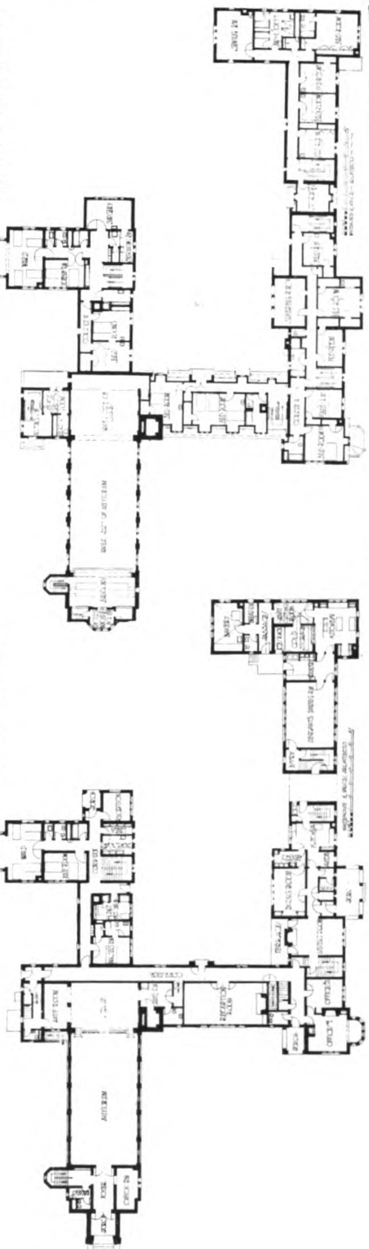
AUDITORIUM ENTRANCE FRONT

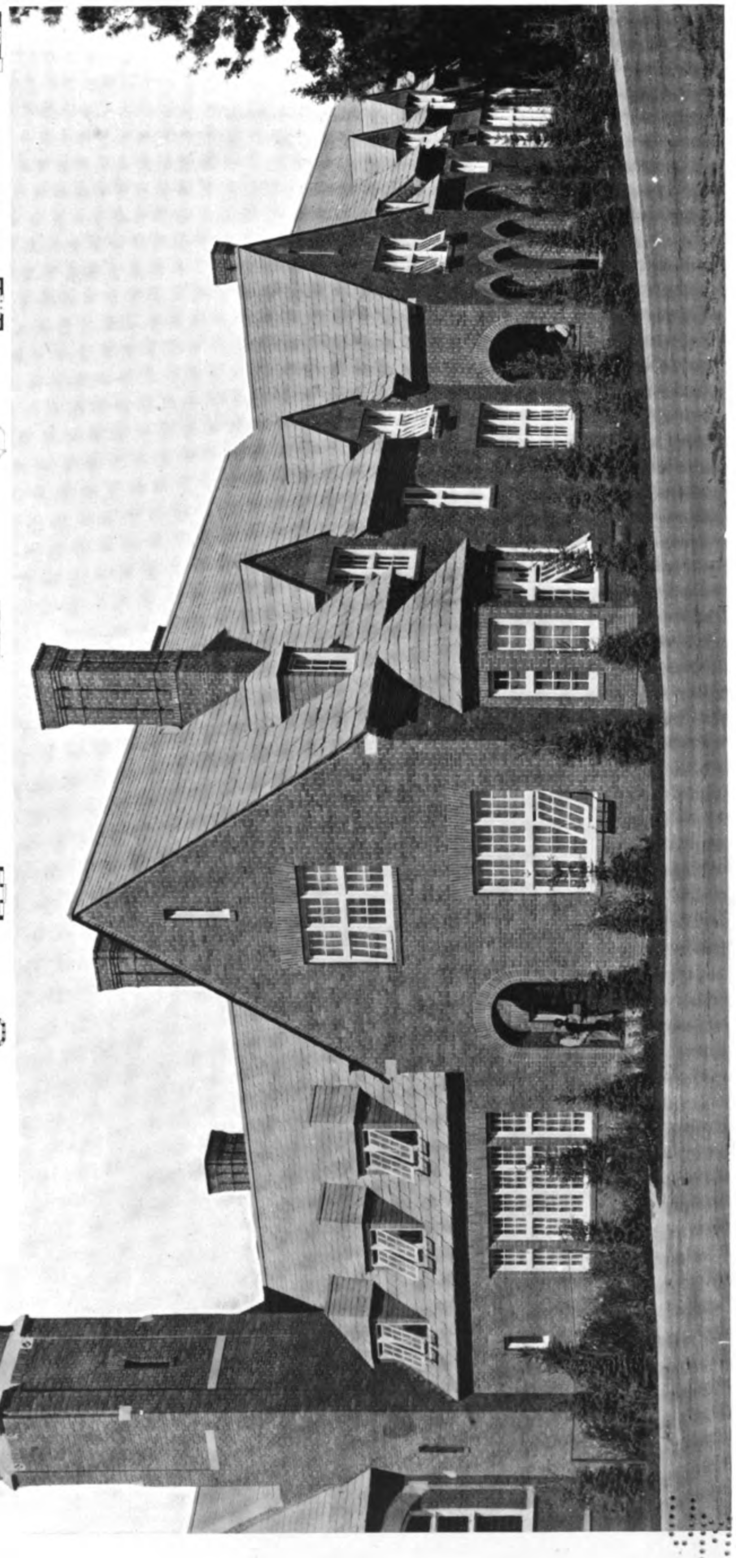
HUTTON SETTLEMENT, SPOKANE, WASH.

WHITEHOUSE & PRICE, ARCHITECTS

SECOND FLOOR PLAN

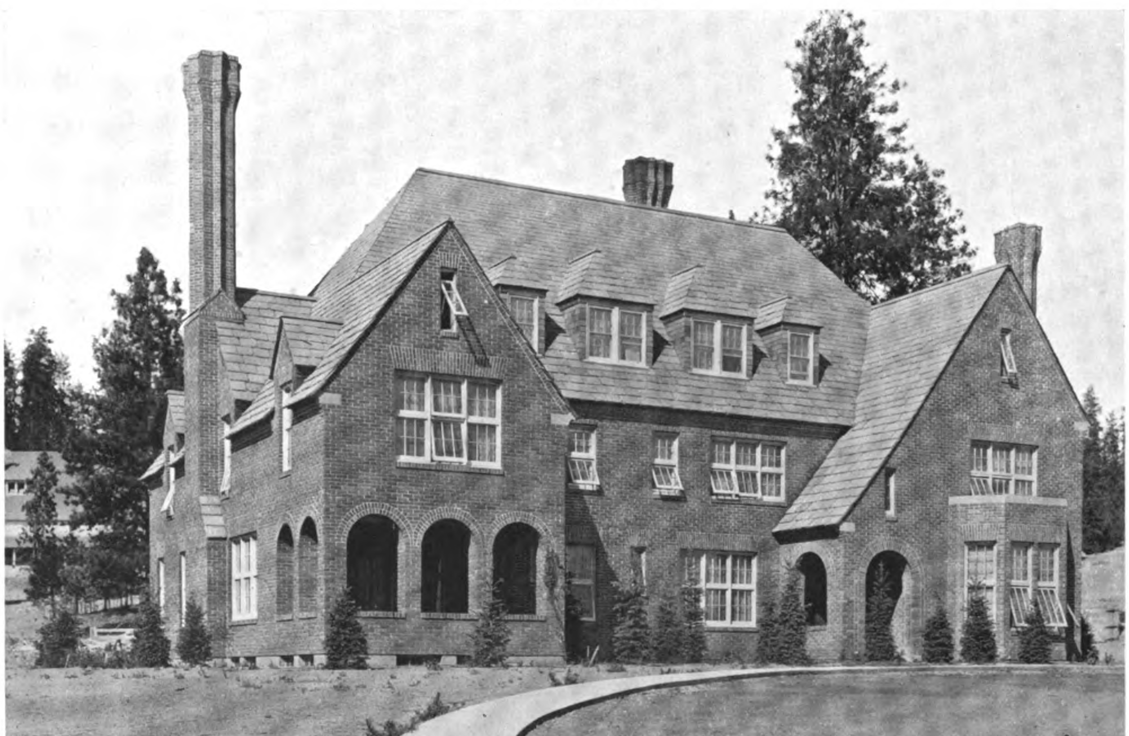
FIRST FLOOR PLAN





1. HUTTON SETTLEMENT, SPOKANE, WASH.
WHITEHOUSE & PRICE, ARCHITECTS

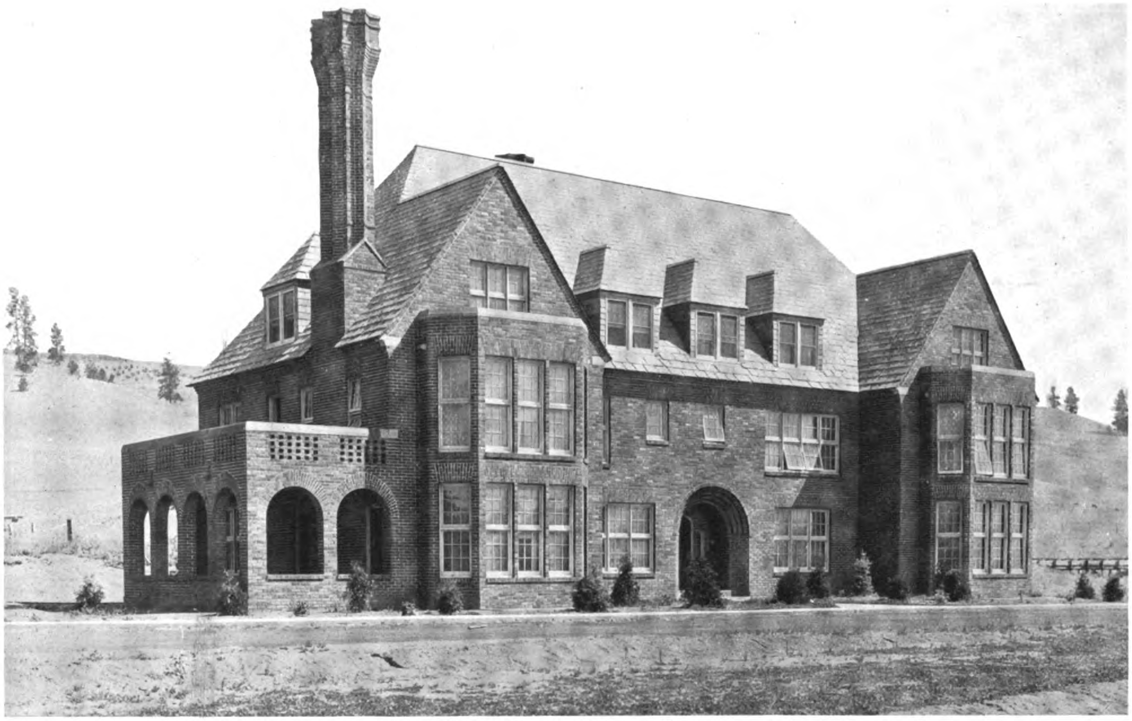
COTTAGE NUMBER TWO



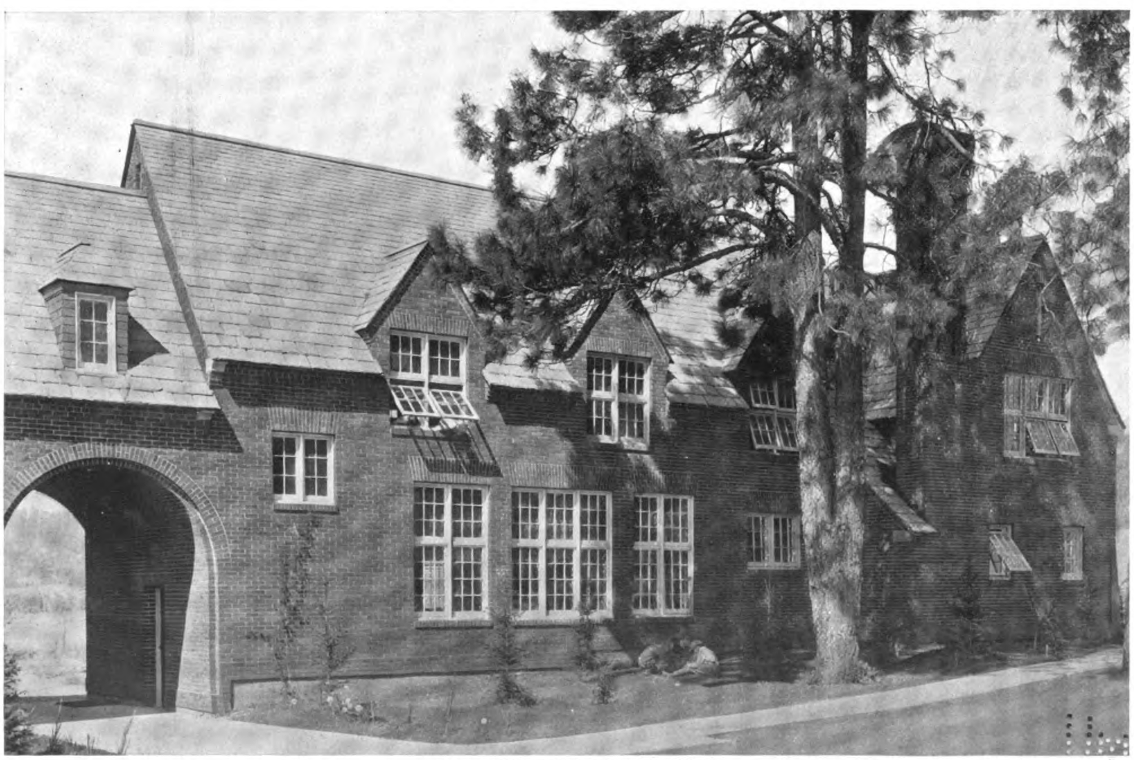
COTTAGE NUMBER ONE

HUTTON SETTLEMENT, SPOKANE, WASH.

WHITEHOUSE & PRICE, ARCHITECTS



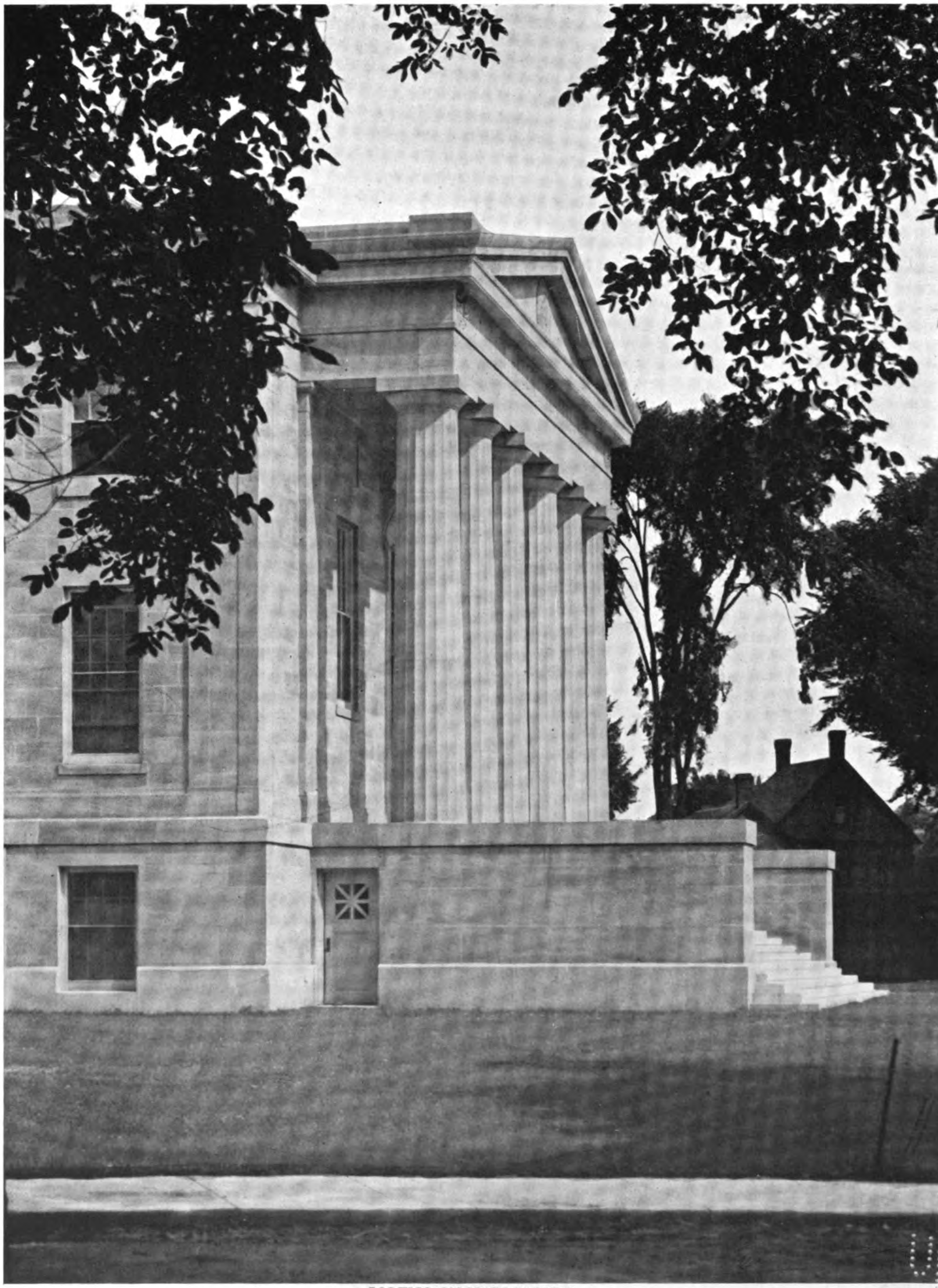
COTTAGE NUMBER THREE



ADMINISTRATION SERVICE WING

HUTTON SETTLEMENT, SPOKANE, WASH.

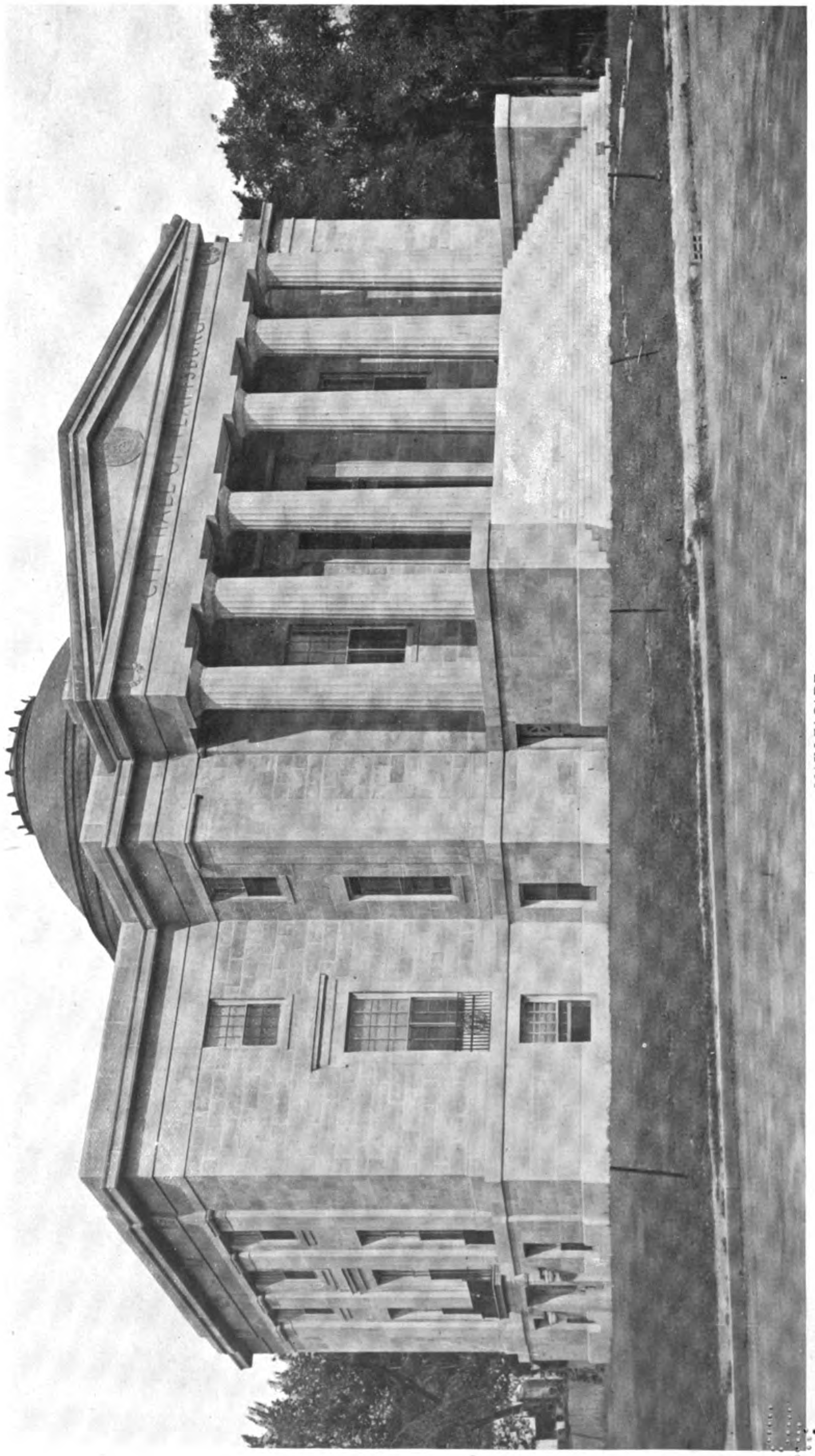
WHITEHOUSE & PRICE, ARCHITECTS



PORTICO ON MAIN FACADE

CITY HALL, PLATTSBURGH, N. Y.

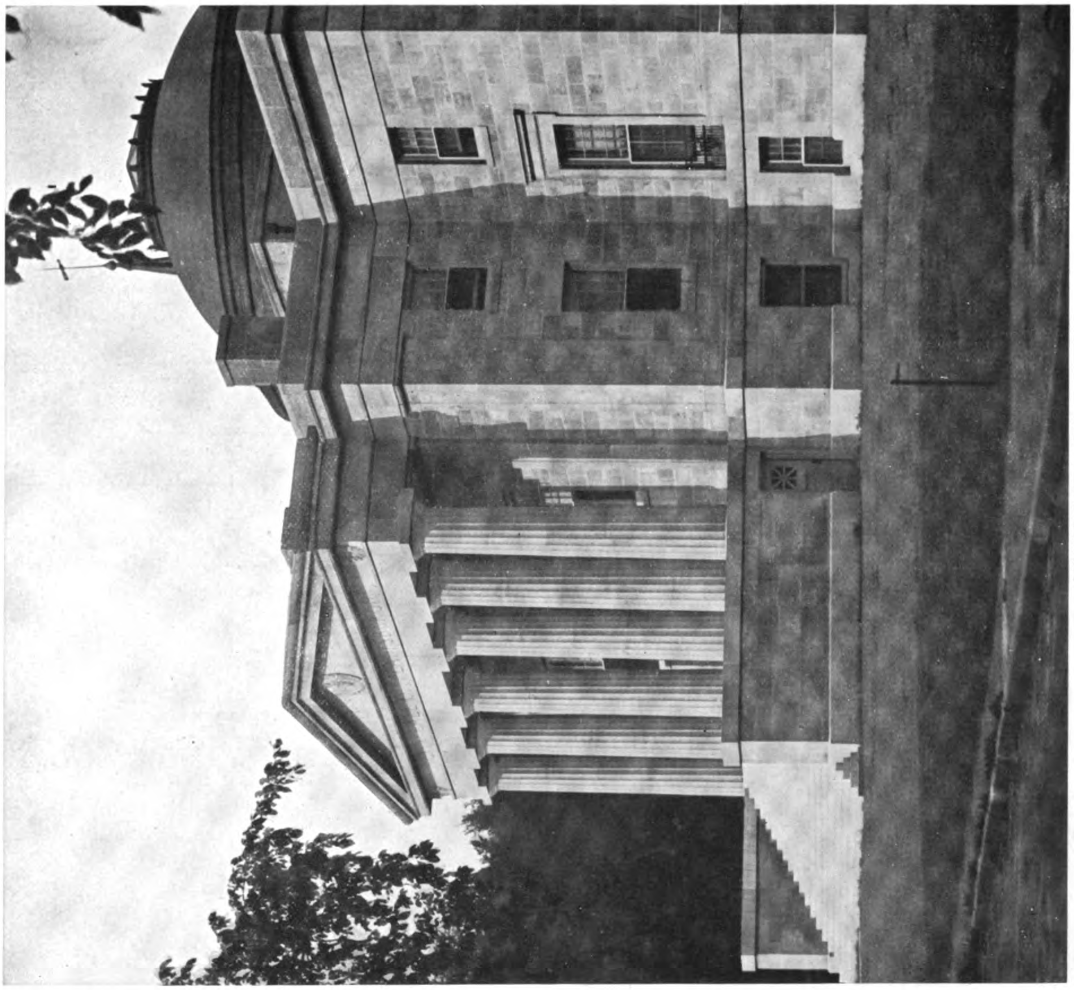
JOHN RUSSELL POPE, ARCHITECT



MAIN FACADE

CITY HALL, PLATTSBURGH, N. Y.

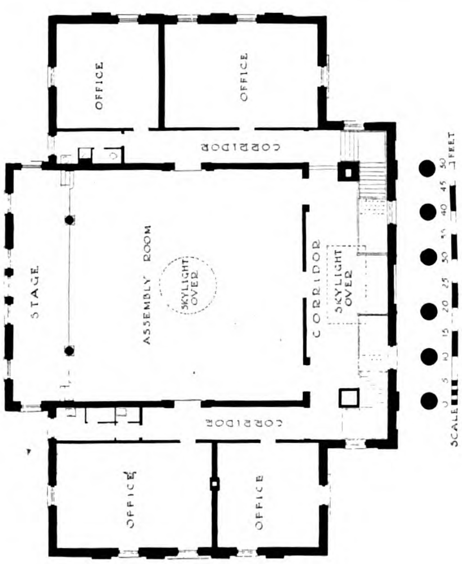
JOHN RUSSELL POPE, ARCHITECT



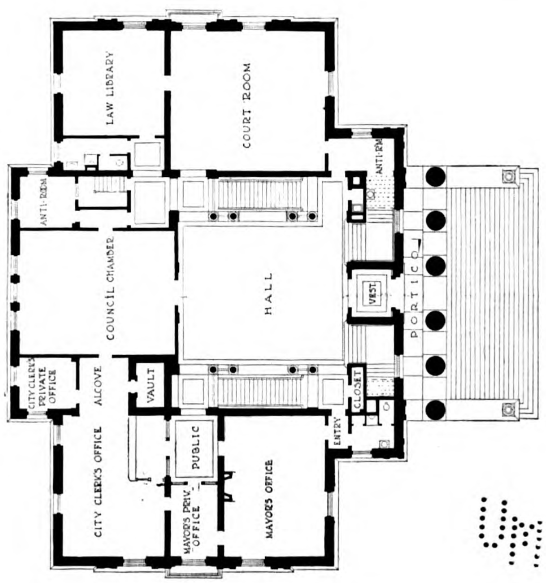
VIEW FROM STREET

CITY HALL, PLATTSBURGH, N. Y.

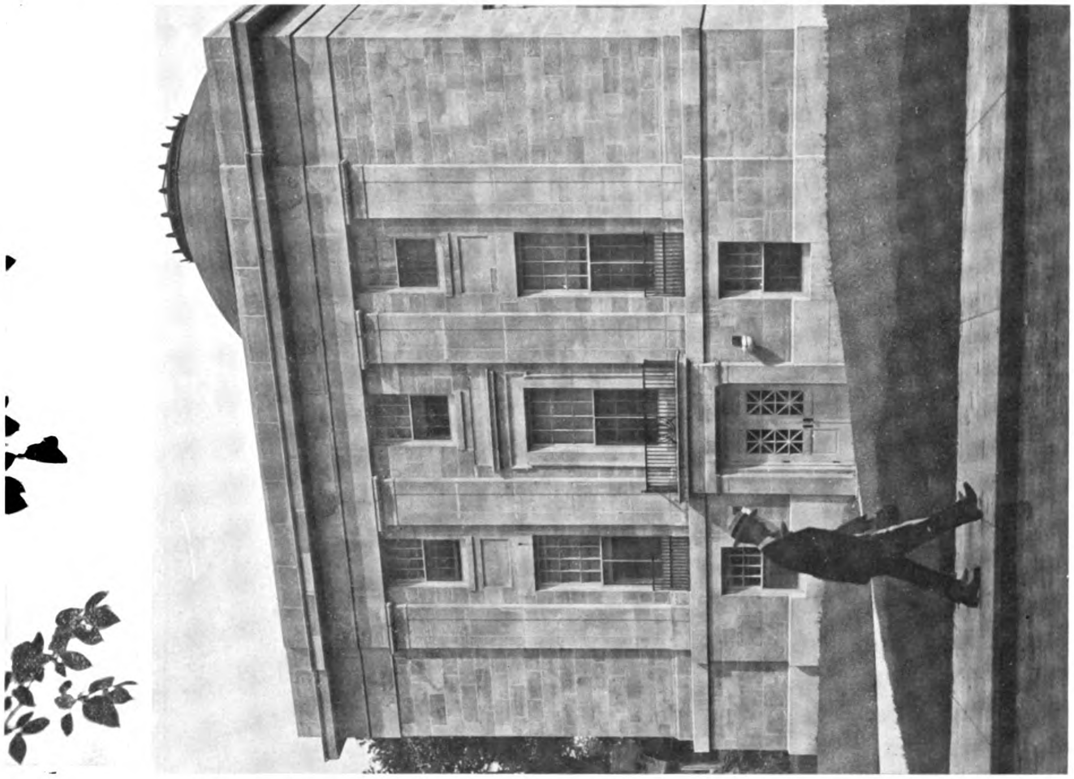
JOHN RUSSELL POPE, ARCHITECT



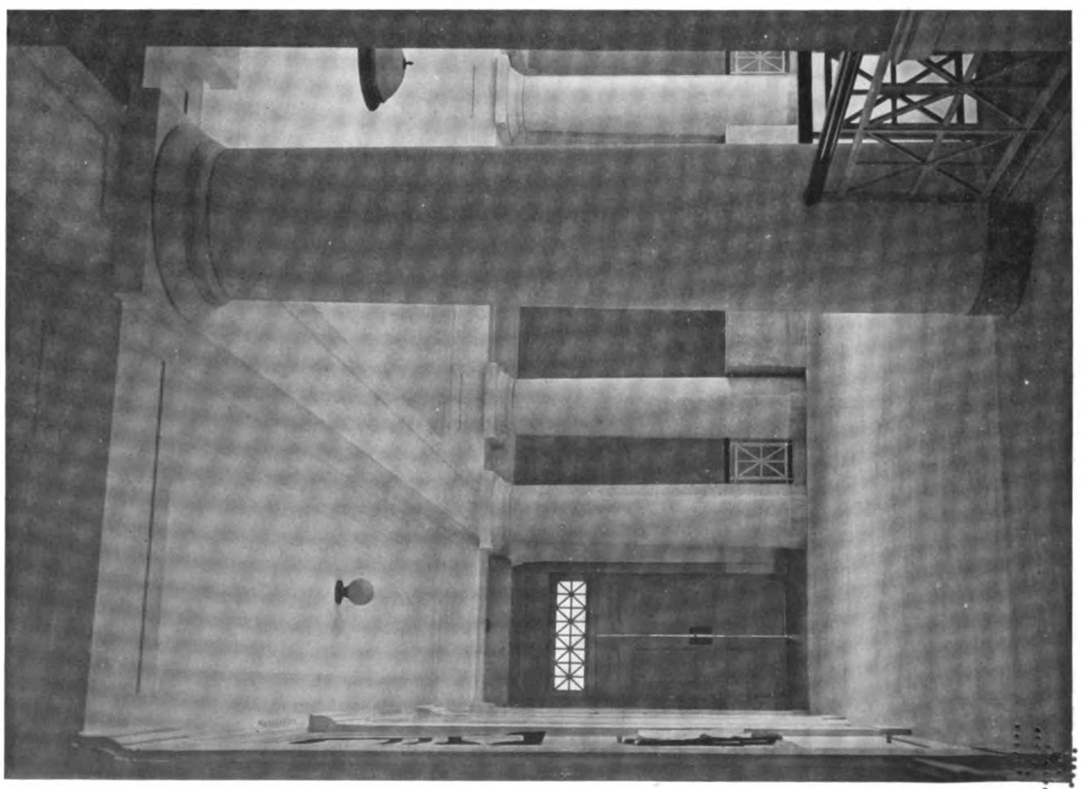
SECOND FLOOR PLAN



FIRST FLOOR PLAN



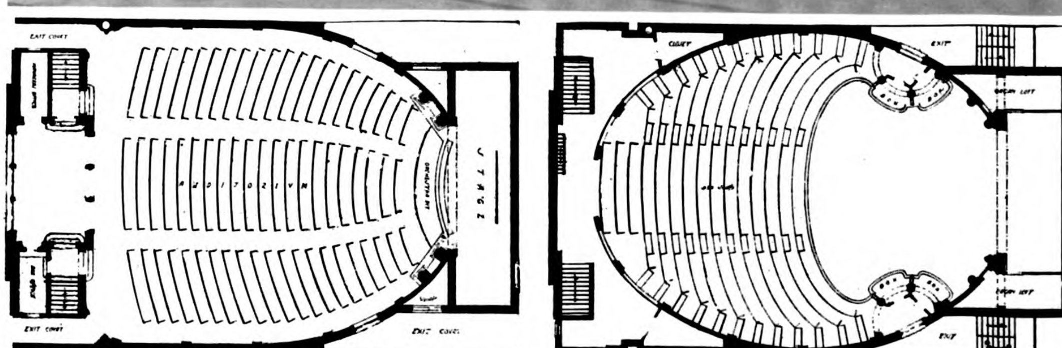
SOUTH FACADE



ENTRANCE HALL

CITY HALL, PLATTSBURGH, N. Y.

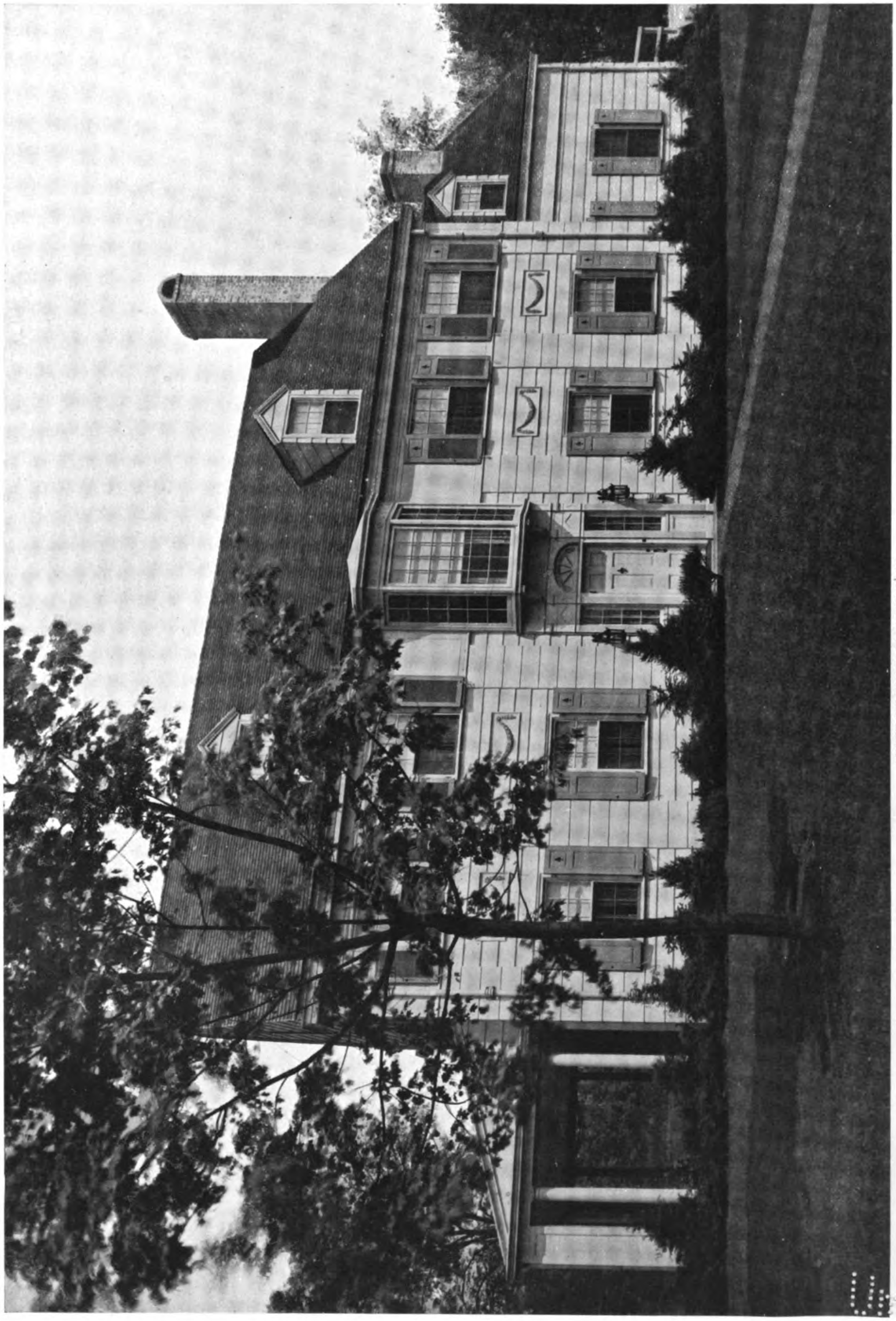
JOHN RUSSELL POPE, ARCHITECT



AUDITORIUM AND BALCONY PLANS

PARKWAY THEATRE, BALTIMORE, MD.

OLIVER B. WRIGHT, ARCHITECT

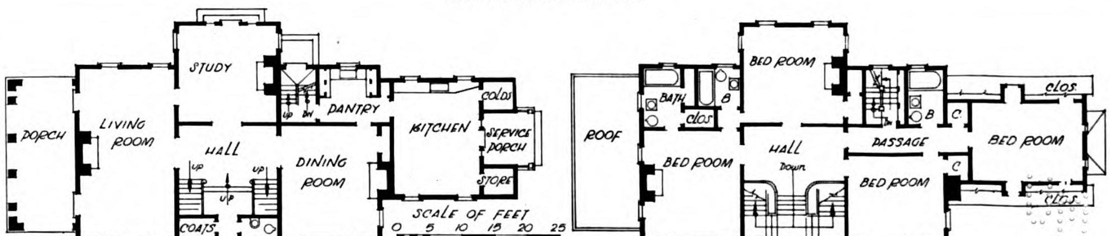


VIEW OF ENTRANCE FRONT

HOUSE OF MRS. I. F. WARDWELL, STAMFORD, CONN.

AYMAR EMBURY II, ARCHITECT

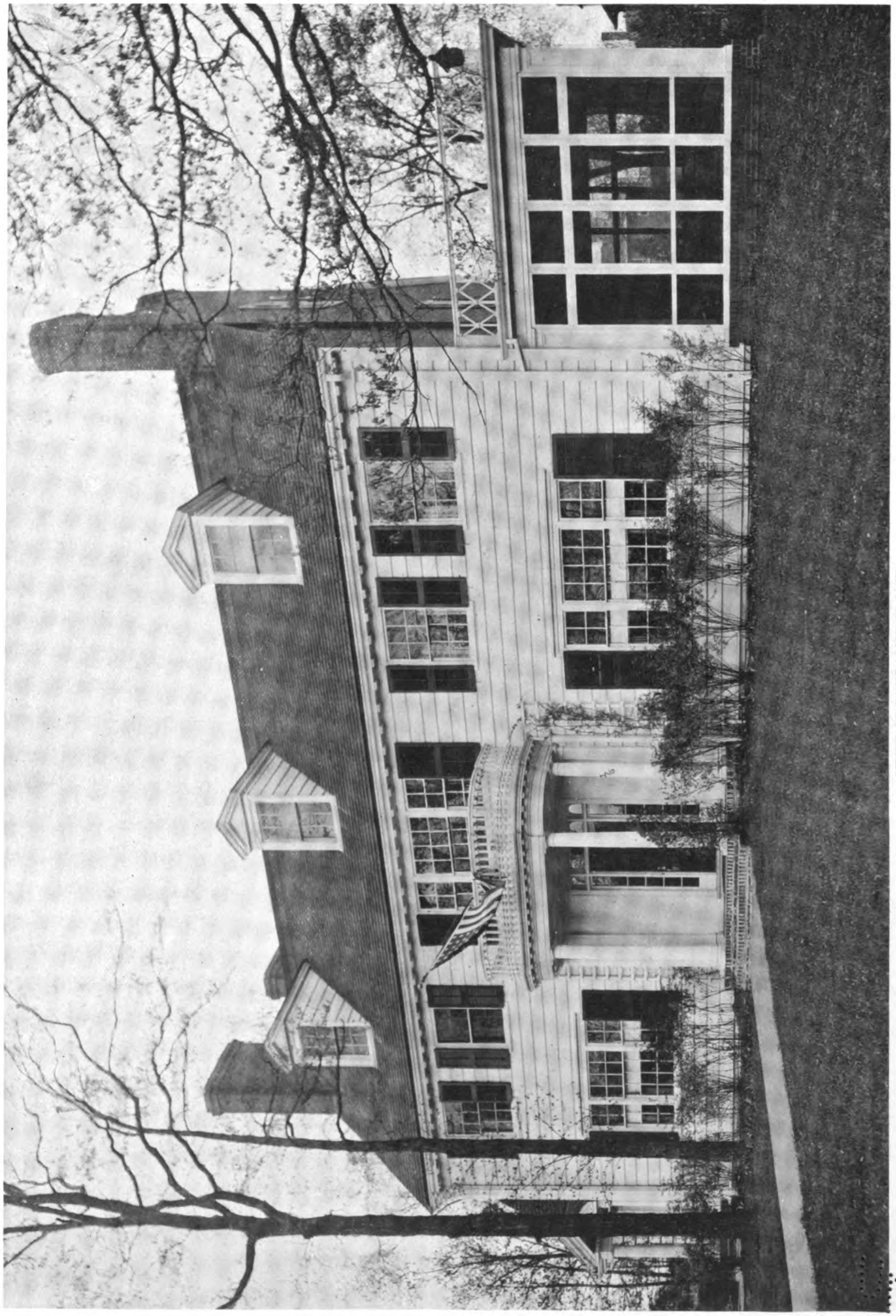
DETAIL OF ENTRANCE



FIRST AND SECOND FLOOR PLANS

HOUSE OF MRS. I. F. WARDWELL, STAMFORD, CONN.

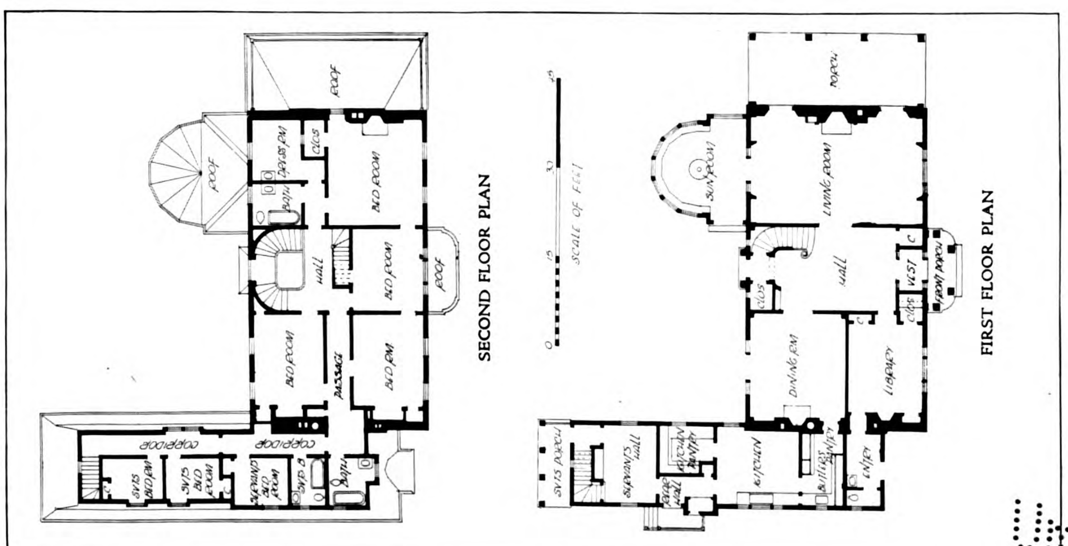
AYMAR EMBURY II, ARCHITECT



VIEW OF ENTRANCE FRONT

HOUSE OF JAMES T. WHITEHEAD, ESQ., DETROIT, MICH.

CHARLES M. BAKER, ARCHITECT



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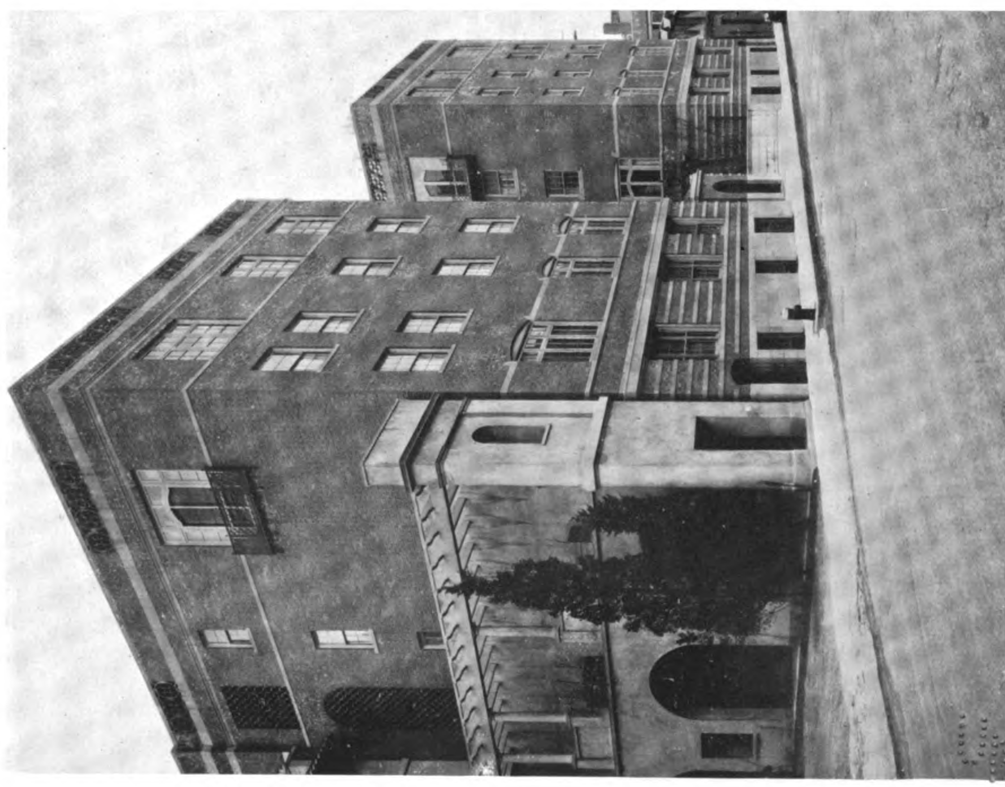
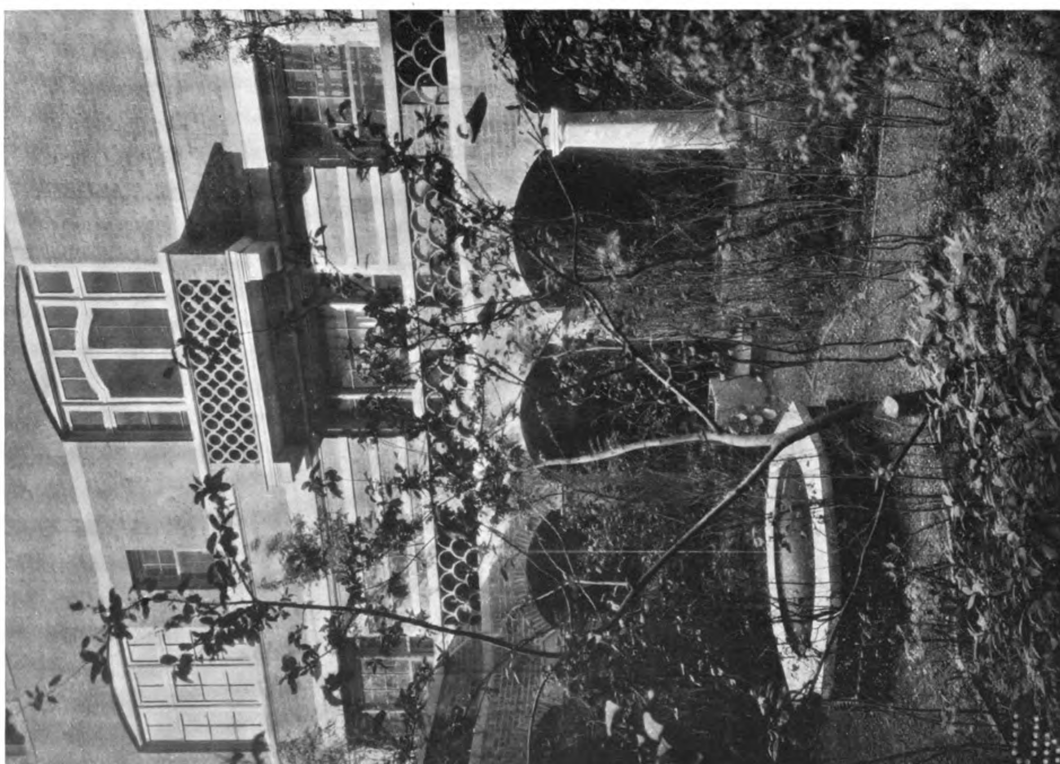


GENERAL VIEWS

APARTMENT BUILDING, CHESTNUT STREET, BOSTON, MASS.

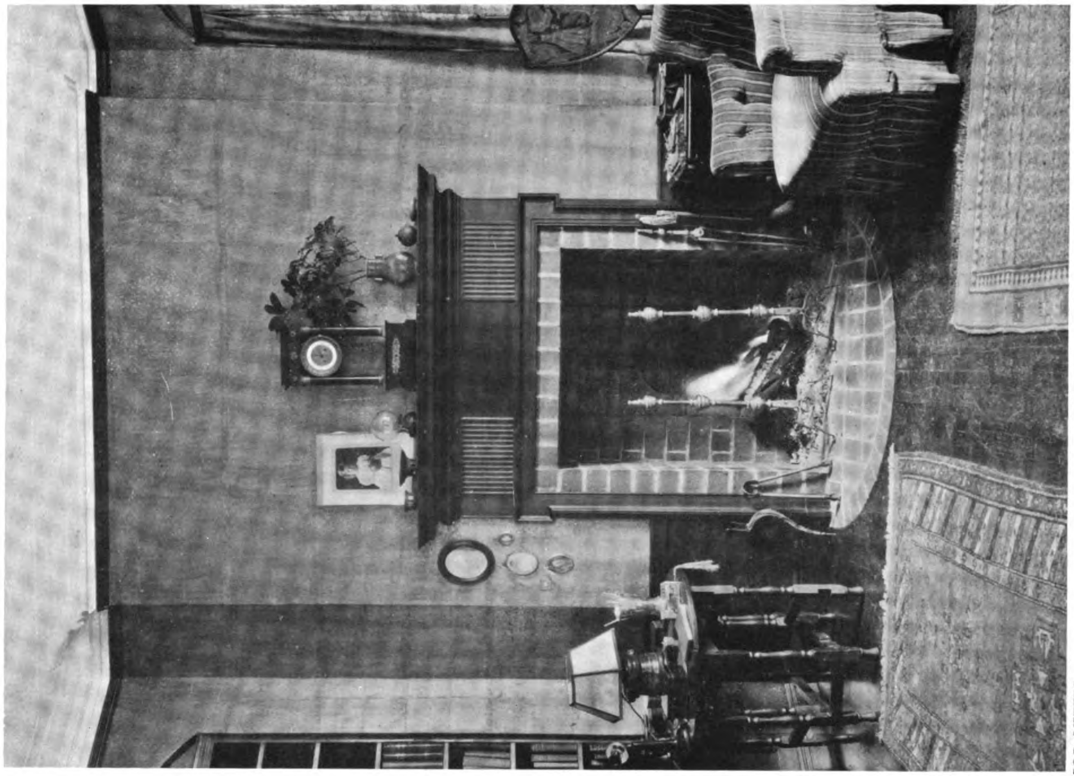
RICHARD ARNOLD FISHER, ARCHITECT

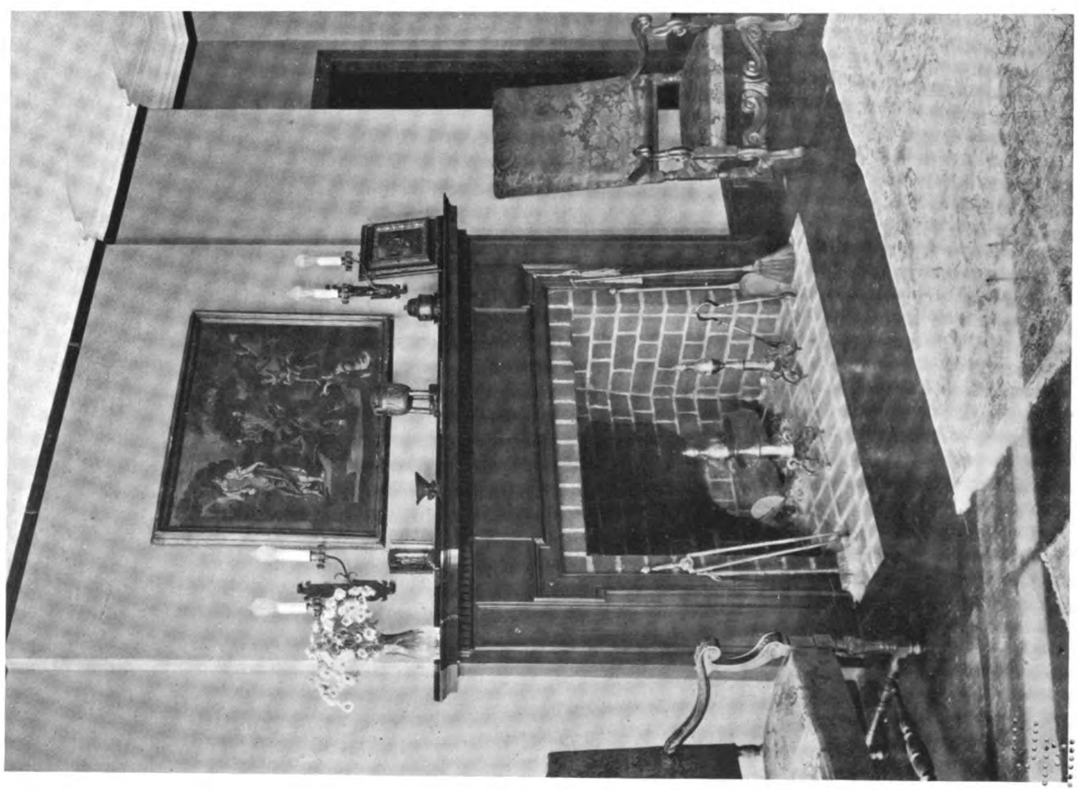


DETAILS OF COURTYARD

APARTMENT BUILDING, CHESTNUT STREET, BOSTON, MASS.

RICHARD ARNOLD FISHER, ARCHITECT





TYPICAL INTERIOR VIEWS
APARTMENT BUILDING, CHESTNUT STREET, BOSTON, MASS.
RICHARD ARNOLD FISHER, ARCHITECT

THE EDITORS FORUM

ARCHITECTS SHOULD WATCH BUSINESS CONDITIONS

THERE was perhaps never a period in the history of modern architectural practice when in spite of an insistent demand for buildings there were more difficulties in the way of getting actual work under construction. This is, of course, due to the abnormal conditions applying in the business world following the strain of war. Conditions, moreover, are constantly changing and various new factors arise from month to month that seriously affect the business outlook.

During any period of feverish activity such as followed the war interest in conservative and low dividend paying investments gives way to free speculation offering greater returns. We may take, for instance, the falling off of the bond market. While stock investments and speculation amounted to amazing figures, the demand for conservative investment and safe bonds has fallen off to such a point that bond quotations have been lower than during critical days of the war. Even the most stable forms of gilt-edged security, such as Government bonds and public utility bonds, have reached low levels of quotations as evidenced by the depreciation in Liberty bonds.

Even as bond investment is conservative, so investment in building projects is conservative. The average bond pays a well defined interest on the money invested. There is nothing showy and no great speculative profit is to be expected. Similarly in building investments which are not of a speculative nature there is a fairly well defined limit on the amount of interest which one may receive.

Throughout the country there is a reactionary wave sweeping through the business field that in general is of a somewhat depressing nature, and in some sections there is even talk of a panic. Judging broadly, it would seem that the ordinary type of business panic is out of the question, as this usually comes when production is much greater than demand. We face the opposite condition today, when the only possible sharp panic is a type which has been described by prominent statistical authorities as an "underproduction" panic. In other words, when production cannot meet demand, coupled with the high cost of production, there is created a situation where there is little profit in the limited volume of production possible.

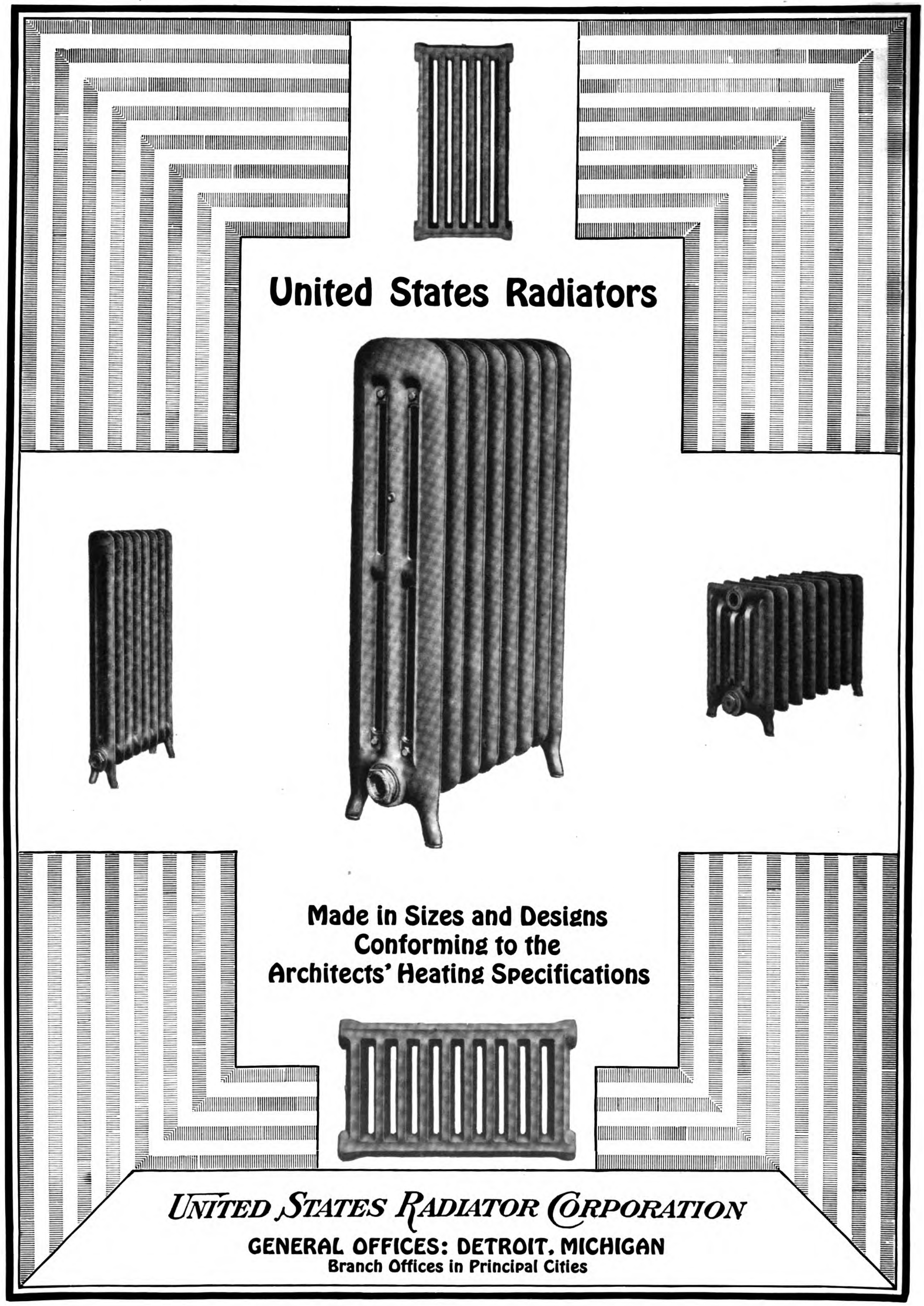
The fact that the actual buying of commodities and luxuries is falling off shows that the public will not stand much more price raising, and this fact, coupled with Governmental control and price-fixing activities, is decreasing public interest in investment in industrial securities, where great profits were made during the war period.

Hence we now face a condition where the public is thinking of leaner years to come and instead of using rapidly accrued money in the purchase of luxuries and in the more extravagant forms of speculation, the tendency right now is to stop all kinds of buying other than that of necessity, and to hold on to see what the future will bring.

THIS is the attitude many loaning institutions have taken, and, as a consequence, a decided falling off in building is noted. Transportation difficulties are likewise playing an important part in the slowing up of building. The demand for buildings of all types continues great nevertheless and, with the prospect of good business for several years as soon as conditions have become somewhat stable, there are to-day many opportunities to carry out building operations that will insure attractive returns if the money to finance them can be had. Necessity always proves the mother of invention, and it is so to-day in the present building difficulties. In the eastern section of the country money for construction is being found by the use of the co-operative idea. This is simply a means of getting prospective tenants of property to finance construction by advancing amounts of money that might be considered as advance rent payments.

The procedure is clearly outlined in the Department of Architectural and Building Economics in this issue and a careful reading will repay any architect whose practice is largely in the class of investment building.

In general the curtailment of building may be looked upon as an advantage. It cannot be of any great duration; in the meantime the lack of transportation will permit some accumulation of building materials with possibly slight price reductions, building labor will have had an opportunity to estimate the effect of its destructive tactics, and the deflation for which the banks are working will bring about renewed interest in conservative investments. The conditions when building again becomes active will not be very different from those at the end of the war. There will be a decided advantage to those who start building operations first. So much building is needed that once the movement starts there will be great activity, and materials will again become scarce and high priced under pressure of demand. Architects should advise their clients to prepare their plans now so that advantage may be taken of the first favorable conditions.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Conforming to the
Architects' Heating Specifications
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THE EDITORS FORUM

D. KNICKERBACKER BOYD SELECTED FOR IMPORTANT BUILDING SERVICE

LABOR conditions have been giving every one connected with the building industry very great concern since the resumption of building following the war. Rapidly increasing wages augmented by evidences of decreased efficiency have been looked upon as ruinous, and in spite of varied attempts at finding an amicable solution of the difficulty, conditions have grown no better. We have lamented the absence of interest of the workman in his trade, his chief concern appearing to be to work as small a number of hours as possible and to exact in return the largest wage without any thought of the quality of service he rendered. It has many times been said that interest in craftsmanship—love of work for its own sake—would have to be revived in the workman before we could again have satisfactory working conditions or produce any work of quality. This has been said, but how seriously has any one tried to go about securing it?

It may come as a surprise to architects to know that a group of labor unions in Philadelphia has come forward and actually done something toward that end. But back of that there is a suggestion made by an architect that awakened in the laboring men a different spirit than we have been able to see by looking only at the surface. D. Knickerbacker Boyd is the architect and to him is due the credit for having inaugurated a movement among labor unions that is unprecedented and which promises to develop a system of intelligent contact between workers and employers in the building industry that should go far toward eliminating the friction so prevalent.

Last autumn Mr. Boyd gave an address before the Council of the Allied Building Trades in which he urged that labor should devote a larger portion of its meetings to matters of education and information, concerning itself with improvements in the various crafts and trades, and that discussions of strikes, wages and hours should give way to discussions of opportunity for co-operation with others and service to the public at large.

The direct result of this was the establishment of classes in the Bricklayers' Union to study their own craft and to learn the principles of plan reading. At every meeting of the Union last winter, under the auspices of Mr. Boyd, addresses were given by men prominent in building circles with the result that the workmen took greater interest in their occupation, became more efficient and more appreciative of the aims and ideals of the designers and occupants of buildings.

With this proof of the value of co-operation and human contact, arguments were advanced that similar results could be had in other branches of building and that harmonious relations could be maintained between the unions and employers if the respective organizations could be brought together instead of working separately as they always have done. Labor considered that architects represented the consumer in a way approached by no other profession or business, and it was determined that building labor should place its confidence in an architect to aid in bringing about the co-operation desired.

Mr. Boyd was asked to assume this duty which he has accepted. He will head a committee of nine, four members of which have been appointed by the Council. The remaining four Mr. Boyd has full authority to select. In the time preceding the completion of the committee he is authorized to represent the nineteen building trades unions of Philadelphia before any builders' or other similar organizations.

THE COTSWOLD TRADITION

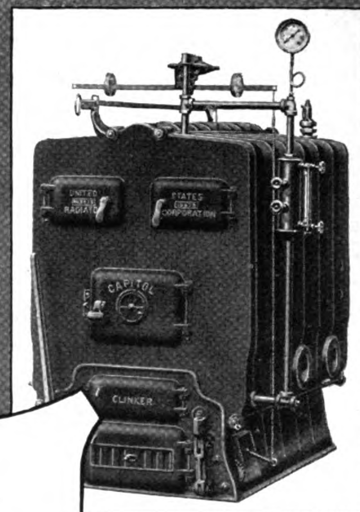
IN late years American architecture, particularly as it applies to country house work, has been striving toward a simpler expression; we have been paying less attention to dogmatic styles and have been aiming at a pleasing expression of domesticity through an intelligent use of local materials.

This is the quality which has always called forth our praise of English domestic work. English architects have not been noted for brilliant ingenuity; they have, however, long enjoyed a reputation for exercising good taste in the use of materials and for creating a home-like atmosphere in their country houses. It is but logical, therefore, to look to English architecture for inspiration in the use of materials. In the Cotswold district there developed a type of house which was the result of local craftsmanship working with local materials.

This type of design and building finds ready application in parts of the United States where similar conditions exist as in the English locality. In Pennsylvania, for instance, we have a native stone that closely resembles the English stone. What could be more sane or appropriate than to be guided by the stone houses of the Cotswolds where several generations have developed a type of building that displays to the fullest degree the characteristics of this stone? A group of Philadelphia architects have done this and in adapting the Cotswold principles to American requirements they have produced a local type of great interest.

In the preceding issue of the FORUM we illustrated a number of such houses from the designs of Duhring, Okie & Ziegler. For purposes of comparison in this issue we illustrate a modern English house designed in the Cotswold spirit that shows the essentially domestic appeal of the type and the sincere way in which the English architect respects local tradition.

CAPITOL BOILERS



In Operation

Please the owner and confirm the judgment of the man who specifies them

"It's the TEST that tells"

UNITED STATES RADIATOR CORPORATION

GENERAL OFFICES: DETROIT, MICHIGAN

BRANCH OFFICES IN PRINCIPAL CITIES

THE EDITORS FORUM

THE difficulties with which we are contending in reconstructing the business of the country are greatly stimulating thought along economic lines, and not a few see in the widening gap between the forces of labor and capital evidence that our industrial system is founded on wrong premises. It is undeniable that all thoughtful people wish to see a community of interest developed that will guarantee contentment of all forces on which we depend for the prosperity of the country. In the following letter Mr. Ackerman asks some pertinent questions suggested by a recent editorial. His query as to what constitutes stable conditions for the majority should be of interest to architects because of their peculiar professional position.

To the Editor:

I wonder whether or not your editorial in the July FORUM expresses the attitude or the viewpoint of the Architectural Profession toward building and labor. In any event it is a subject worth discussing since it seems to me that in the viewpoint expressed we have evidence that the nature of the problem has not been discovered.

Like most arguments of the kind, this editorial points out that "while diminishing activity is not looked upon as a happy prospect, there is promise that out of the present situation will come several adjustments that will mean better and more *stable conditions.*" After reciting notorious conditions relating to transportation, coal production, preferential freight rulings, the effect of deflation, the short time operation or the complete closing down of plants, the editorial states with respect to the last: "This is releasing many workers . . . the extreme shortage of *help* in the building industry is gradually being changed to a *reasonable surplus.* This will have a *steadying effect* on building labor because, . . . their success in gouging high wages has not been due essentially to their organization but to the *natural law of supply and demand* . . . and, if the present slack in building is responsible for nothing else than *bringing labor down to earth, any resultant sacrifice will have been wisely made.*"

Thus an attitude toward the problem before us is quite clearly defined; and what is commonly understood by *stable conditions*, by *help*, by *reasonable surplus* (labor), by the *natural law of supply and demand* is quite as clearly revealed, both by direct statement and by implication. We discover what is meant by a *steadying effect;* we are afforded an insight into how it is that the present industrial system goes at its task of providing necessary goods and services. A hope is voiced in the plan suggested and in the prophecy made.

Within the realms of Business Enterprise, *a stable condition*, a good condition, a right condition, is evidently one in which there is a *reasonable* number of men who have no jobs. This expresses one of the curious elements of the business viewpoint. We are given an insight into its limitations. It fails utterly to realize that, to those who make up the *reasonable surplus, stable conditions*, good conditions, right conditions *must of a necessity appear as quite the opposite in character*. There is not much reason in this scheme as viewed by the *reasonable surplus*, — those who have no jobs.

And it is curious economics. For how in the name of Common Sense is this *reasonable surplus* of men and their families, — whose existence is demanded by the scheme, — how is this surplus to live? No one has been able to make this plain.

No doubt when conditions with respect to labor supply pass from a shortage to a surplus there will appear to be a steadiness as viewed from the outside. But the disappearance of jobs is not likely to be so viewed by one whose job suddenly disappears while the price of food, clothing and rent remains stationary or rises. But by what method of rationalization it can be worked out that things would remain *steady* with more men than jobs is not disclosed.

I suspect that it is the tenacious clinging to this concept of *stable* or *normal*, on the part of those who are certain to benefit by conditions being *stable* in this particular sense, which really accounts for the general conditions of *instability* which, as everyone knows, have obtained for a long time.

Some little light is thrown upon the nature of what is referred to as the *natural law of supply and demand.* Apparently we have gotten into a settled habit of throwing whatever operates toward a beneficent end *as regards our own pecuniary circumstances* into the category of *natural* laws. Whenever events move in the opposite direction, that is to say, when circumstances shift in such a way as to involve us in a pecuniary loss, we account for the shift by saying that it is due to "disturbing factors." There is little doubt that in the minds of a rapidly increasing number of people, faith in this law as the beneficent regulator of all social and industrial affairs is rapidly falling away. It looks as if we were rapidly approaching a period of its complete disallowance. The theory of *natural laws* — the *law of supply and demand* — does not rest, it would seem, on very secure ground.

What stands out as most clearly revealing a definite viewpoint on the part of those not rated as Labor is the reference to bringing Labor down to earth. This is said openly in the face of known facts as to the rather astonishing profits which have been made in practically all of those enterprises of financial business which have to do with supplying both necessary and unnecessary goods and services;— and also in the face of the fact that the upward curve of wages distributed with respect to the production of necessary goods has remained below that disclosing the advance in the selling price of the same. Be that as it may. Within democratic society, Labor is assumed to be free. Hence such a statement as *bringing labor down to earth* is hardly to be construed as aimed at sustaining Labor in a state of freedom. For if Labor is not free,— if it is merely relatively free,— it follows as a consequence that Labor is slave or relatively slave, which is precisely what Labor contends.

But let us return to *stable conditions* and *steadying effects* by way of adding emphasis upon one point. It is because of the demand (blameless of course, under a system of investment for a profit in terms of price) upon the part of the directors of our industrial system for a speedy return to the pre-war conditions of a *surplus* of Labor, which occasions the *lack of stability* and the lack of *steadiness* on the part of all but a small minority. For a surplus of Labor, even within a small section of the wage earning community, throws the entire wage earning community into a dangerous condition of economic insecurity. The dawn of consciousness on the part of the wage earners the world over concerning the origin of this sense of economic insecurity,— the realization that under the existing system of financial business a surplus of Labor *must somehow be maintained*, accounts for the restlessness and the tactics adopted by those primarily affected.

All that has been stated should fall within the category of the perfectly obvious. But it does not so fall; fallacious economic preconceptions shut off our vision. We go on insisting that conditions are stable when they are actually quite the reverse to the majority of people. It would seem that the first step toward securing a stable condition would be to set up some more adequate definition of the term as viewed by the majority. Since this is not likely to happen, it follows that the prospects of industrial stability are as yet somewhat remote.

Yours very truly,

FREDERICK L. ACKERMAN

August 27, 1920

Winter Approaching!

This, however, brings no anxiety for the property owner whose architect has provided for the installation of

Capitol Boilers

and

United States Radiators

Heating equipment not only economical in the use of fuel, but product of recognized and established character for durability and efficiency.

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GENERAL OFFICES: DETROIT, MICHIGAN

BRANCH OFFICES IN PRINCIPAL CITIES

THE EDITORS FORUM

THE RAPID DEVELOPMENT OF INTEREST IN CO-OPERATIVE BUILDING

IN the course of presenting several articles from month to month in the Department of Architectural and Building Economics it has been said several times that while active interest in co-operative building has been largely confined to New York City, ultimately there would be shown national interest in this subject and that undoubtedly a large volume of building construction would proceed through this method of financing if sufficient information on the subject could be disseminated.

Several letters which have been received recently relative to this subject tend to show the diversified and widespread interest in the question of co-operative apartment house financing and it is evident that as these plans are worked out many buildings will be constructed. Extracts from letters received from different sections of the country are given. We shall be glad to answer inquiries of other readers who may be interested in any of the questions brought out in these letters.

From a Chicago architectural firm:

"We are very much interested in the ideas contained in the article 'Co-operative Ownership to Meet the Present Shortage of Buildings' in the copy of THE ARCHITECTURAL FORUM received yesterday. If it is not asking too much we would appreciate the names and locations of a few of the buildings that have been built on this plan in New York."

From a letter from an architect:

"I am very much interested in the article in the July FORUM on co-operative ownership, and would like, if possible, more detailed information on recent buildings which are of the less expensive type of apartment in which instalments were paid for stock.

"I should also like to know in such cases how the building operation was financed, when the mortgage and minimum cash payments do not equal the cost of building as shown in the chart. How was the balance to complete operations secured? Did the contractor take the stock, or was the money secured through mortgaging this stock?

"It is impossible here to build for any such cost as shown per room; it would be more nearly double. The plan is fine and undoubtedly some such scheme will be necessary in order to promote building in the future."

From Philadelphia architects:

"We have read with interest recent articles in the FORUM relative to co-operative building. We have had in mind something of the kind for some time and would like to find out more about how it actually works out. Could you put us in touch with anyone who has put one of these propositions through? Any suggestions you might offer to forward such a project will be appreciated."

From a Canadian realty investment corporation:

"We are subscribers to THE ARCHITECTURAL FORUM and have just read with great interest the Associate Editor's article on co-operative ownership for apartment house building.

"We are contemplating erecting a Class A apartment house building on the co-operative plan and would greatly appreciate any information as to where further statistics could be obtained of buildings which have been successfully operated and financed in this manner. Mr. Taylor refers to a prospectus of a proposed project of this sort. Would it be possible to obtain a copy?"

From a Trenton, N. J., architect:

"Referring to the article in the March edition of THE ARCHITECTURAL FORUM, 'The Co-operative Method of Financing Buildings,' I note that you say you are collecting additional data for the benefit of owners who might be interested in financing apartment house propositions on the co-operative plan.

"I am interested in an apartment house proposition in Trenton that we are trying to finance under this plan. I would appreciate it very much if you would let me have any details that I might be able to make use of in trying to put through our proposition. I would also appreciate it very much if you would forward me any further information on this subject."

From a prospective owner in Seattle:

"Will you please put me in touch with several of the companies who have organized and promoted co-operative apartment houses? I would like to get several prospectuses and learn a little more of this plan.

"Your articles appearing in June and July issues are very illuminating as well as instructive. If you have any more information or descriptive matter on the subject or if you can give me the names and addresses of any companies who have built and operated apartments on the different plans, I would be deeply grateful."

From another prospective owner in Iowa:

"I would appreciate very much, if it is possible for you to do so, that you furnish me the name and address of the attorney or attorneys who have been employed in the preparation of articles of incorporation for co-operative apartment house ventures, especially of the type costing $200,000.

"Our building will be a twelve-family building, six stories in height and I am enclosing a print of the first floor plan and believe you will agree with me that it has exceptional merit."

THE EDITORS FORUM

ARCHITECTS AND ENGINEERS AGAIN

RECENT months have seen a number of statements from the engineering profession claiming that architects serve only a secondary need in the planning of structures which are of a utilitarian nature. They were occasioned, primarily, by the appointment of architects within the year to supervise the design of an important bridge at Pittsburgh. The *Engineering News Record*, which is most alert in promoting the welfare of engineers, has now found a bridge designed by an architect on which some ornament is rather senselessly applied and the editors present comments of engineers as conclusive proof that architects are entirely out of their proper field when designing bridges.

It is interesting to note that although architects took little or no interest in our contemporary's absurd statements, at least a few engineers have recognized the injustice to the profession and have presented a true estimate of the architect's service which it has given us much pleasure to read.

The comments of Mr. N. H. Holmes, assistant engineer with Charles T. Main, Boston, are so evidently sincere and expressive of the feeling that should exist between architects and engineers that we quote them in part.

"To select some examples of exceedingly poor taste in design, and to judge artists and architects as a class thereby, is hardly sportsmanlike. The several horrible examples of sham and gingerbread work cited proved merely that although a man may sign himself 'architect' and practice that profession, he is not really an architect unless properly trained for his work. Occasionally an engineer designs a bridge or other structure that has beautiful lines and proportions, as for example the Brooklyn Bridge, but more often we get the usual ugly type of highway or railroad bridge so common everywhere. They are generally well designed . . . but they are hardly things of beauty except when judged by the rule of 'handsome is as handsome does.'

"It does engineers no good to sneer at 'art' or architects because of isolated examples of bad design. The public is coming more and more to understand that rarely does the engineer put into his design the grace and beauty that the well trained architect can give. The writer believes there is glory enough for all in large work, and that the engineer can no more enter the field of the architect than an architect can do engineering."

This is the spirit that should exist between architects and engineers and we are glad to see it expressed. Intelligent men in both professions should endeavor seriously to bring about closer relations and eliminate petty professional jealousy.

JOINT REGISTRATION IN OHIO

THE Association of Ohio Technical Societies has prepared a bill for the joint registration of architects and engineers. All technical organizations in the state are asked to consider it and make suggestions to be discussed at a meeting of delegates prior to December first. It contains lengthy definitions of the practice of architecture and engineering to make certain that such definitions as would undoubtedly be required before its passage are intelligently phrased. Ohio architects and others interested should investigate the bill carefully in order to insure adequate consideration for the complicated phases of architectural practice. The bill is of a blanket nature following the practice of the medical and legal professions of giving uniform certificates for all branches.

BOOK NOTE

INDUSTRIAL HOUSING : With Discussion of Accompanying Activities, such as Town Planning, Street Systems, Development of Utility Services and Related Engineering and Construction Features. By Morris Knowles, Mem. A.S.C.E. New York: McGraw-Hill Book Co., Inc. Cloth, 6 x 9 ins.; 408 pp. Illustrated. Price, $5.00.

Housing and town planning are still somewhat new to American architects and engineers. Its greatest activity took place during the war and hardly sufficient time has elapsed to allow for the preparation of seriously considered literature on the subject. The material available has been mostly in the form of scattered magazine articles or books written in view of English experience. This present volume, therefore, should meet a definite need.

The author had, previous to the war, a wide experience in municipal and utility engineering and direct association with the many problems of housing and town planning through his connection with government war housing as chief engineer of the Housing and Transportation Department of the Emergency Fleet Corporation.

The wide range of topics covered has imposed briefness on the author in order to compass the subject in a single volume. Directness of statement is, therefore, noticeable throughout and the many points are well illustrated with diagrams and photographs drawn from actual practice. A considerable number of useful cost figures are given including those showing total and percentage outlays for houses and for accompanying land, streets and utilities. Altogether the book is a practical and workable presentation of a complex subject. The architectural side of the problem is recognized and a number of interesting housing groups are shown in small illustrations, but the greater emphasis is placed on the land development and design and installation of utility features.

After five years, the owners of this building say:

"—the linoleum is giving entire satisfaction and I can recommend your goods to those desiring a durable and satisfying floor-covering."
A. Woodman, Mgr.
Oliver Ditson Company.

The date of this letter is *June 9, 1920*—*Gold Seal* Battleship Linoleum was laid *November, 1915*, by John H. Pray and Sons Company, of Boston.

CAREFUL craftsmanlike attention to detail is apparent all through the magnificent Boston building of the Oliver Ditson Company shown herewith. Witness the floors, in complete accord with the restful, efficient tone of the rest of the building. *Gold Seal* Battleship Linoleum was the floor-covering selected—5,000 yards of this sterling value material were used.

But not only in office buildings—for the floors of salesrooms, factories, auditoriums, hospitals, etc., *Gold Seal* Battleship Linoleum rates 100% efficient.

Sturdily durable, easy to clean, quietly comfortable underfoot, and pleasing in color tone—it is not only built to give absolute satisfaction (every yard built strictly according to U. S. Navy Specifications) but is definitely guaranteed to give this satisfaction—guaranteed by the Gold Seal Guarantee.

Gold Seal Cork Carpet—If *absolute silence* is demanded of the floor under consideration—use *Gold Seal* Cork Carpet. It is quietly comfortable, and restfully silent underfoot, with all the yielding springiness of a heavy carpet. We make it in soft shades of brown, green and terra cotta—with surface polished or dull—10 shades in all. Of course it is absolutely guaranteed—by the Gold Seal Guarantee.

Feel free to call upon our Service Department for any advice regarding floor-coverings. We are always glad to send, upon request, samples and specifications for laying. Address our nearest office.

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Battleship Linoleum
(THE FAMOUS FARR & BAILEY BRAND)
Made According to U.S. Navy Standard

On every two yards of Gold Seal Battleship Linoleum will be found our Gold Seal bearing this definite pledge—"Satisfaction guaranteed or your money back."

GOLD SEAL
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GUARANTEE
SATISFACTION GUARANTEED OR YOUR MONEY BACK
REMOVE SEAL WITH DAMP CLOTH

THE EDITORS FORUM

THE MODERN ORPHANAGE

TENDENCIES in the planning of institutional buildings, especially for children, have been changing very much in recent years. Most authorities are now agreed that such buildings should be planned on the "cottage system," which most nearly permits approaching normal home surroundings.

In this number we present illustrations and plans of one of the most recent orphanages to be erected — the Hutton Settlement at Spokane, Wash. It is of particular interest because of the special study the architects were able to give the problem before taking up the preparation of drawings. Mr. Harold C. Whitehouse, a member of the firm entrusted with the design of the buildings, visited the most important children's institutions of the country and by means of interviews with superintendents and personal observation of working conditions formulated a program for the development of the new orphanage based on the successes and failures of existing institutions. An ample fund and the desire of the donor of the buildings to erect a group that would be thoroughly modern made this detailed study of the problem possible. Mr. Whitehouse published the results of his investigations in two articles that appeared in THE FORUM for February and March, 1919.

PROPOSED PENNSYLVANIA BUILDING CODE

TODAY, when the cost of building is so serious a factor, architects should be alert to the possibilities of simplifying building procedure when such action will tend to reduce costs. An opportunity for such service exists in the formation of more reasonable building codes as suggested by an architect in this issue.

In this connection we would call to the attention of architects the preliminary plans now under way for drafting a building code for the State of Pennsylvania. Recently a conference called by Clifford B. Connelly, Commissioner of the Department of Labor and Industry, voted in favor of the State Industrial Board making a tentative draft which would be submitted to public hearings in various parts of the state.

A committee has now been appointed to start the project. James B. Cronin, member of the Industrial Board, Keystone Building, Harrisburg, Pa., is chairman and D. Knickerbacker Boyd, 1700 Walnut street, Philadelphia, an architect member.

There should be no attempt made to lessen in any way requirements necessary for safe and adequate construction, but in view of existing difficult conditions every effort should be made to determine regulations that will permit of the economical use of material and especially to rule out provisions based on political preferment for which many existing codes can be justly criticized.

UNITED STATES CHAMBER OF COMMERCE TAKES UP HOUSING

THE gradual realization that our national housing shortage is a serious hindrance to the proper social and business growth of the country is noticed in the recent formation of the Civic Development Department of the Chamber of Commerce of the United States. Mr. John Ihlder, the well known housing specialist, has been appointed head of the Department which gives assurance that in its efforts to assist in solving the problem the Chamber will have a practical knowledge of conditions. Mr. Ihlder's interest in housing and civic affairs was aroused in 1903 while he was an editorial writer on the Grand Rapids *Evening Press.*

BOOK NOTES

MEMOIRS OF THE AMERICAN ACADEMY IN ROME. Volume III, 102 pages, 91 plates, 10½ x 13½ inches. New York: University Press Association. Price $8.

The major portion of this latest volume from the American Academy in Rome provides a complete catalog of the Bernardini Tomb, the contents of which are exhibited in the Museo Preistorico. This is one of the most important of the tombs erected by the Etruscans during the VII century B.C. and inasmuch as only by the preservation of these tombs and their excavation, which was undertaken in the last century, are we enabled to know anything of the art or civilization of these people, this careful compilation of its treasures is of great value to the archæologist.

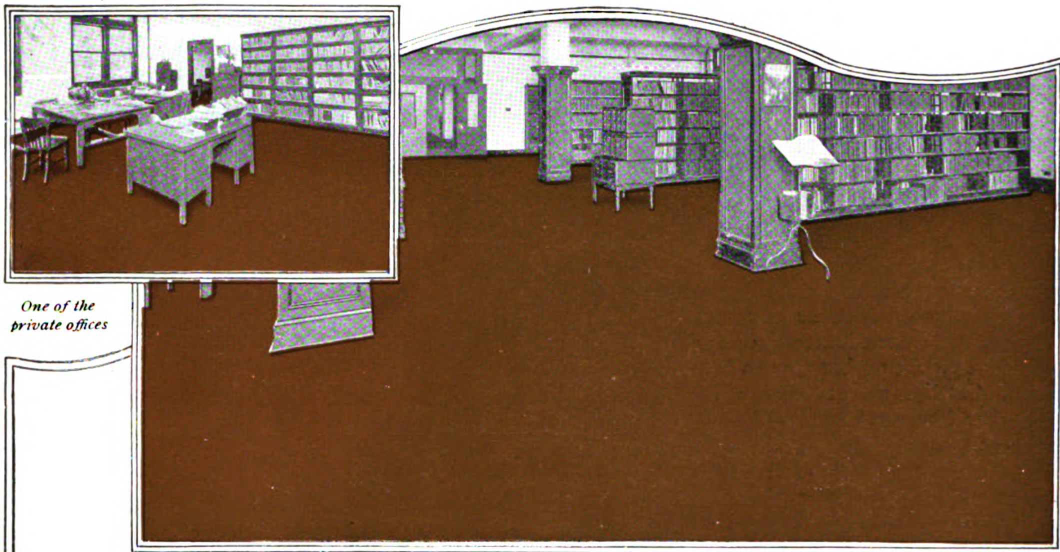
HANDBOOK OF FIRE PROTECTION, by Henry A. Fiske, Everett U. Crosby and H. Walter Forster. New York: D. Van Nostrand Company. Price $4.

The sixth edition of the Crosby-Fiske-Forster Handbook on Fire Protection is a practical and interesting reference volume for the architect's working library.

This publication contains complete information regarding the details of planning, construction and equipment covering elements of design to check the spread of fire; protection equipment, including all phases of the automatic and open sprinkler problem; signaling systems, and watchmen's service. The publication is well indexed and should serve as a valuable handbook to the architect who wishes to gain knowledge in any phase of planning in which the menace of fire is a consideration.

A CORRECTION

Through an error the design of the apartment house at 863 Park ave., New York, illustrated on page 189 of the November issue, was credited to Mr. Charles A. Platt. Mr. George Mort Pollard is the architect of this building and we regret that it was not so mentioned.



One of the private offices

Gold-Seal Battleship Linoleum in library of School of Mines, University of Minnesota, Minneapolis

An Atmosphere of Quiet Efficiency—

Quiet efficiency reigns in the library and offices of the Minnesota University School of Mines—no clatter of footsteps to disturb. Comfortable, noiseless floors of *Gold-Seal* Battleship Linoleum assure this restful atmosphere.

But not only in the library and offices—this thoroughbred floor-covering is making good on the floors of nearly every building in this school.

Absolutely suitable as a floor-covering for libraries, auditoriums, office buildings, theatres, industrial structures, etc. Silently comfortable underfoot, easy to clean, an attractive brown in color and durable to the *n*th degree (every yard built strictly according to exacting U. S. Navy Specifications). Its sturdy appearance registers a definite promise of 100% floor service—a promise backed by a strict guarantee. On every two yards of *Gold-Seal* Battleship Linoleum will be found our Gold Seal bearing this pledge, "Satisfaction guaranteed or your money back."

Gold-Seal Cork Carpets

For absolutely *noise-proof floors*—specify *Gold-Seal* Cork Carpet. This efficient, durable floor-covering is as velvety quiet underfoot as the heaviest woven carpet. Made in restful shades of brown, green and terra cotta—ten in all—with polished or dull surface, and, of course, service guaranteed by the Gold-Seal Guarantee.

If you have a floor-covering problem, call upon our Service Department for any advice you may require. Write our nearest office for samples of these thoroughbred floor-coverings.

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GOLD SEAL
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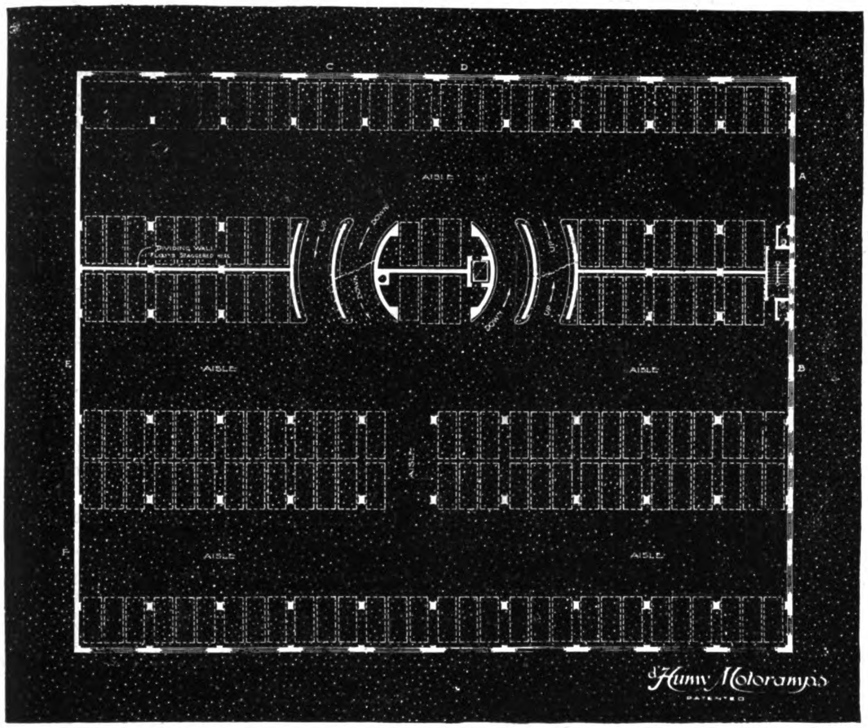
A Patented System of Building Design involving a combination of ramps with staggered floor levels (the building being divided into two units) and applicable to multi-floor garages, service buildings, factories and warehouses.



For that large plot of ground

this d'Humy Motoramp Garage Floor Plan possesses many decided advantages.

It will handle unusually heavy traffic.

Up and down traffic are on independent Motoramps.

It makes for the most economical distribution of space and consequently the greatest storage capacity.

A widespread interest is being manifested in this modern system of building design. Many Architects and Engineers have already received their copies of our "Book of d'Humy Motoramps." It contains a series of blue prints showing typical floor plans and other interesting data—description, advantages, economies and comparative earning capacity.

If you wish a copy, please write for it

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50 CHURCH STREET NEW YORK

R-7

TAKING the PUBLIC into PARTNERSHIP

Even on Michigan Avenue, Chicago's famous lake-front boulevard, you easily recognize the Railway Exchange Building as a landmark. It is faced entirely with light cream enamel Terra Cotta.

Drawing by Hugh Ferriss

Copyright, 1920, by National Terra Cotta Society

RAILWAY EXCHANGE BUILDING
Chicago, Ill.

D. H. BURNHAM & CO., Architects

AS popular appreciation of Architecture grows and expands, the work of the architect becomes easier and more pleasant.

Today there is a wider and increasingly more intelligent appreciation of design—tomorrow the architect will find his work aided by a greater public appreciation of the advantages of certain building materials.

Through the advertising pages of The Literary Digest, every month, National Terra Cotta Society is acquainting the public—owners, investors, tenants, committee members—with those inherent properties of Terra Cotta which are familiar to every architect.

In this series of advertisements in The Literary Digest, which every architect is earnestly invited to read, it will be shown by picture and text that Terra Cotta is a building material permanent, beautiful and profitable.

National Terra Cotta Society is a bureau of service and information operating for the Terra Cotta manufacturers of the United States. Its publications cover not only the technical and structural use of the material but show, as well, examples of its application to buildings of various types.

Brochures of specific value, as indicated by their titles, will be sent to Architects on request:

The School   The Theatre   The Garage   The Store   The Bank

These brochures consist of a selection of illustrations, with text and comment, showing Terra Cotta buildings of the respective types.

Terra Cotta — Standard Construction

A Valuable Technical Reference Work for Architects and Engineers

TERRA COTTA

Permanent   Beautiful   Profitable

GENERAL PROGRAM FOR A

SMALL HOUSE COMPETITION

In Conjunction with

The First "Own Your Home" Exposition to be Held in Chicago, March 26th to April 2nd, 1921

and

The Third "Own Your Home" Exposition to be Held in New York, April 16th to 30th, 1921

This Competition has the approval of the American Institute of Architects, and will be conducted through the leading Architectural journals by Henry K. Holsman, A.I.A., President of the Illinois Chapter of the American Institute of Architects, 175 West Jackson Boulevard, Chicago, as Architectural Adviser.

Article I.—Object

To stimulate the building of more and better homes by (1) securing a large number of well planned economical four, five and six room house designs, to be built in frame, brick and stucco; (2) publishing them in a book to be advertised and sold at the Expositions and at book stores at a price sufficient to cover the cost, from which the home builder can select the one best suited to his location, requirements and taste; (3) making good architectural drawings and specifications that may be duplicated and sold to owners, architects or builders at a nominal price not to exceed $25 a set.

Article II.—Stages of the Competition

The Competition will be held in three stages:

1st stage, a 4-room house in wood, brick or back plastered metal lath and stucco.

2nd stage, a 5-room house in wood, brick or back plastered metal lath and stucco.

3rd stage, a 6-room house in wood, brick or back plastered metal lath and stucco.

The Competition drawings for the first stage will be due January 24th, 1921; for the second stage January 31st, 1921, and for the third stage, February 7th, 1921.

Any architect or firm of architects in the United States, except the Architectural Adviser, may submit drawings for prizes in one or all stages. Competitors in each stage may submit designs for either wood, brick or stucco, or for any or all of them.

Article III.—Primary Cash Prizes

$3,600 in prizes will be awarded as follows:

	1st Prize	2nd Prize	3rd Prize	4th Prize	4 mentions
For Frame house..	**$500**	**$250**	**$150**	**$100**	**at $50 each**
For Brick house..	**$500**	**$250**	**$150**	**$100**	"
For Stucco house.	**$500**	**$250**	**$150**	**$100**	"

Secondary Cash Prizes

In addition to the above prizes, $1,200 will be awarded:

For the best three 4-room designs shown in each material by one competitor **$400**

For the best three 5-room designs shown in each material by one competitor **$400**

For the best three 6-room designs shown in each material by one competitor **$400**

Article IV.—Other Prize Considerations

Thirty or more designs will be selected for publication in book form. A condition of the competition is that each contestant whose design receives a prize or a mention, or is selected for publication, shall prepare within a reasonable time upon demand, a complete set of working drawings and specifications in accordance with standard regulations to be given later. $100 will be paid, in addition to the prize awarded, for each set of working drawings and specifications upon their receipt, and $15 additional will be paid on account of each set of prints sold from the original set.

All designs awarded prizes or selected for publication, and all working drawings and specifications received will become the property of the contributors of prize money as their interest may appear, and will bear the author's name and address as architect, but nothing in this agreement shall prevent the author from making any individual use of his design that he may desire.

Article V.—Conditions of the Lot

For all competitions assume a level lot 40 feet by 100 feet in a small town or city, or a suburb to a large city, either (1) on a corner, or (2) inside and having practically no detrimental encroachments on either side, or (3) with an encroachment of a neighboring house within 1 foot of one side of the inside lot.

Article VI.—Requirements of the House

Assume a home for an American family of good taste, small means, and no servants, desiring to make a charming home with (a) beauty of design obtained by harmony of line, color, and proportion, and simplicity of treatment of the house and grounds, (b) the maximum of comfort in summer and winter, (c) the maximum of housekeeping facility and convenience for all phases of indoor and outdoor family home life, and (d) the minimum exterior and interior upkeep and operating expense, and (e) the minimum of cost consistent with a, b, c and d.

Article VII.—Drawings

Submit drawings in black ink on unmounted white paper, 20 inches by 26 inches within plain black border line 1 inch from all edges. Show one design in one material only on each sheet, consisting of (1) a pen and ink perspective of the house and grounds projected from ¼ inch scale plans, with the picture plane at the nearest corner of the house, without wash or color, with shadows and planes rendered in values as true to nature as possible; (2) floor plans at ⅛ inch scale, walls and partitions blocked in solid, and showing closets and 4′6″x6′6″ beds and 1′8″x3′6″ dressers in all bedrooms, full size bed davenport in living room, 2′6″x5′ bathtub, a lavatory and a water closet in bathrooms, a 4′x4′6″ table in dining rooms, a kitchen sink, and stove, and ice box and laundry trays, and heating apparatus, and no other furniture or fixtures, all drawn to true scale in proper location on the plans; all plans having outside dimensions and the size and the names of rooms and the size of closets and pantries plainly marked thereon; (3) plan of treatment of grounds either in connection with the ground plan or on a smaller scale plot plan; (4) a small cross section giving grade line, cellar and room ceiling and roof heights; (5) in a space within the border lines give a computation of cubage measured from outside of walls, from cellar floor (or from bottom of footing where no cellar exists) to one-half the height of the roof, measured from plate to ridge, figuring one-half of cubage for porches projecting beyond the bearing walls, and full cubage for porches within bearing walls, and give, in the same space, notes suggesting color schemes or other treatment of walls and roof.

All letters and figures should be simple block letters large enough to permit a three-quarter reduction in reproduction.

Article VIII.—Anonymity and Transmissions

No name or mark or sign shall be placed on the drawings or on the package containing them by which the author may be identified (if the sender's name and address be required on the package as in mail or express, a name of a representative may be substituted for that purpose). Drawings flat or rolled shall be packed so as to prevent creasing or crushing, in a sealed package containing an opaque sealed envelope containing the full true name and address of the author and delivered to Henry K. Holsman, Architectural Adviser, Own Your Home Competition, 175 West Jackson Boulevard, Chicago, Illinois, on or before the date set for the close of the respective stages of the Competition. (See Article II.)

Packages thus addressed will be opened and each sheet and the envelope therein given a distinctive mark. The envelope will be kept by the Architectural Adviser, unopened, until the awards are made by the Jury.

Drawings are at the author's risk until returned, though reasonable care will be taken in their handling and keeping. Drawings not receiving prizes or not selected for publication, will be returned to their respective authors.

Article IX.—Jury of Award

The Jury will be composed of five architects representing different sections of the country, nominated by the leading architectural journals, and selected by the Architectural Adviser; assisted by three practical builders, chosen by the Architectural Adviser, who will act as advisers to the Jury on cost, economy of construction and maintenance.

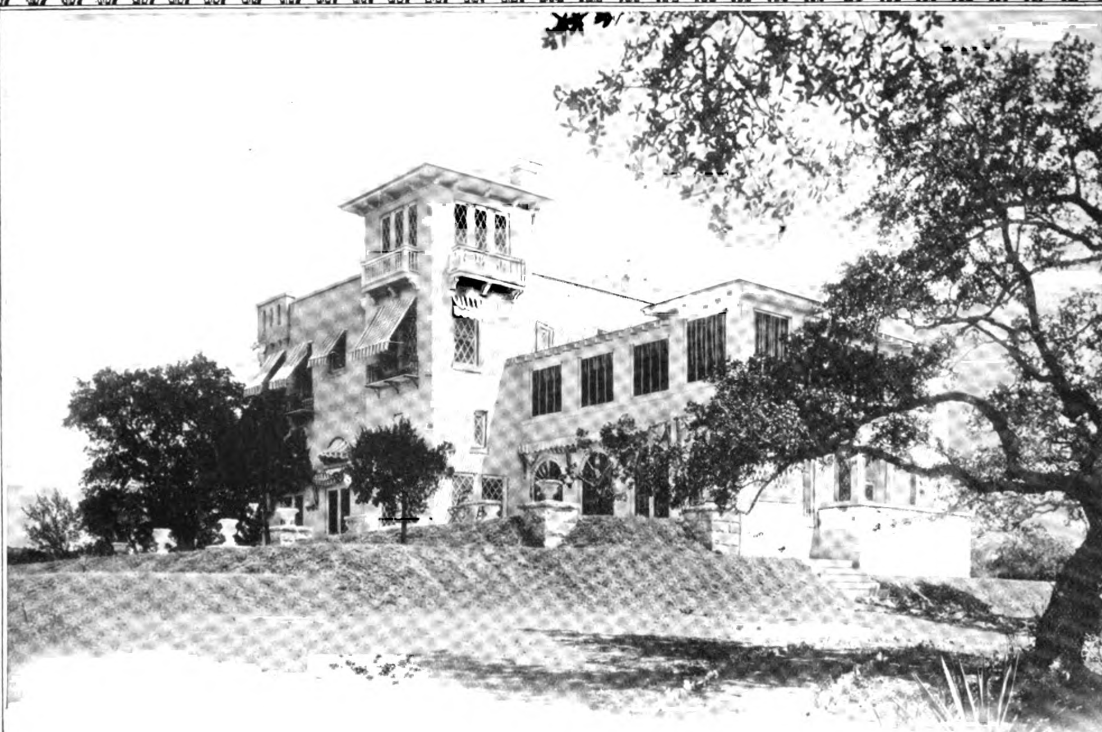
The Jury will meet in Chicago or some other city, organize and devise a scheme of points, considering (a) the relative difficulty of the assumed lot (1, 2 or 3, Article V) in the ratio of 20-30-50 respectively; (b) the merit of design (a, b, c, d and e, Article VI) in ratio of 20-10-10-30-30 respectively; (c) the merits of plan and integrity of presentation (1, 2, 3, 4 and 5, Article VII) in ratio of 10-40-20-10-20 respectively; and other points as they may deem best and award the several prizes according to this program, provided that no prize will be awarded any design which the Jury deems unworthy or violates the express provisions of this program. The Architectural Adviser may be present at the Jury deliberations, but will have no vote.

Article X.—Further Information

Information and details on the proper use of materials will be forwarded to architects upon receipt of their names and addresses.

Address all communications to:

HENRY K. HOLSMAN,
Architectural Adviser,
175 West Jackson Boulevard,
Chicago, Illinois.



Residence of H. H. Sevier
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Warm in Winter Cool in Summer

"A Hand Book of Hollow Tile Construction" is an invaluable reference book thoroughly covering Hollow Tile Construction. It will be sent prepaid to Architects and Engineers engaged in extensive building operations. Address Department 1112

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THE air cells of Hollow Building Tile provide the insulation necessary to protect against inclement weather and assure a healthful, comfortable home.

The large tile units promote rapid construction, accomplishing a marked saving in labor costs. The economy of using Hollow Tile is increased by its strength and light weight, which conserve materials, and by the lasting character of the material, which minimizes maintenance expenses

Considered from every standpoint, Hollow Tile presents important advantages which make it particularly successful for practically every type of structure.

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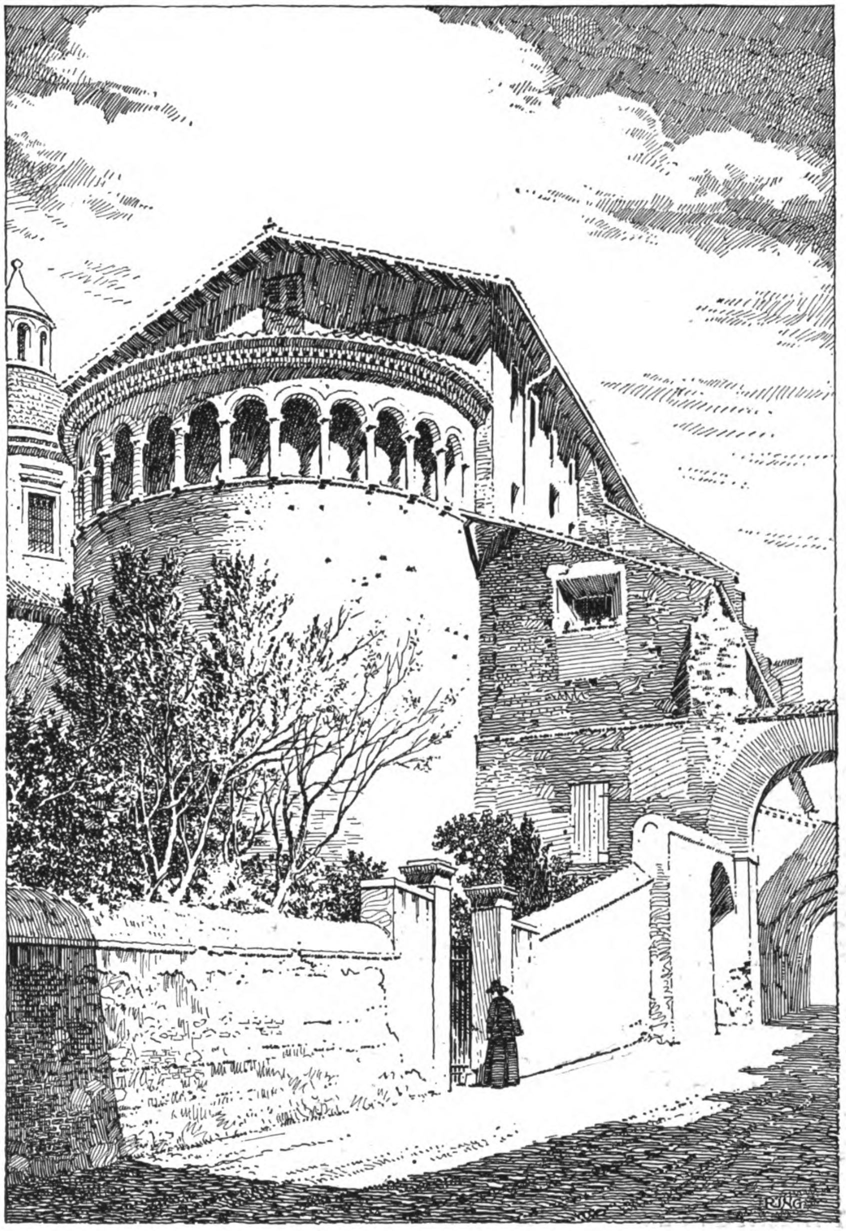

A·F·B·A
USE FACE BRICK
—it Pays

The Apse of St. Giovanni and Paola on the Celian Hill, Rome

STRUCTURES like the Lombard-Romanesque Church of St. Giovanni and Paola, dating from the end of the fourth century, assure the architect that any brick building he erects will be permanent.

And he will find in present-day American face brick a material splendidly adapted to modern architectural requirements, whether for ecclesiastical, domestic, industrial or commercial purposes. The small, pliable units, the wide range of color tones and textures, the texture given to the wall surface by the various bonds and mortar joints, and the decorative possibilities in pattern work and panels, give an infinite scope to the genius of the architect.

Any member of this association is prepared to meet the most exacting brick problems that may come to the architect, and is at all times ready to co-operate with him.

AMERICAN FACE BRICK ASSOCIATION

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SPECIFY
BRADFORD
REDS
(TRADE MARK REG. U.S. PATENT OFFICE)
—the "Ace" of Red building brick—the brick which assures you the very best quality.
You need the best if you desire entire satisfaction.
Bradford "REDS" *are* best—the most modern methods of manufacture and the advantages gained by the use of the famous Bradford Shale makes them so.
Prices quoted upon application
Manufactured exclusively by
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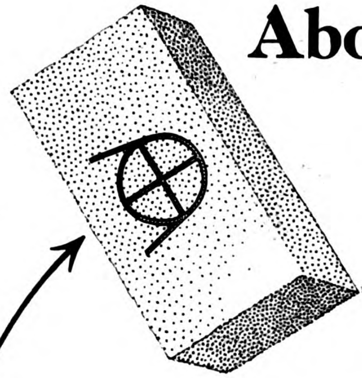
What the Public Thinks About Brick Construction



BELIEVING that it was only necessary to awaken public desire for Brick construction to stimulate the building of homes of Brick, we recently instituted a national Common Brick advertising campaign.

Before this campaign was four months old we had sold 14,000 copies of "BRICK for the Average Man's Home" and "BRICK, How to Build and Estimate." The public gladly paid for these books—a dollar for the former; a quarter for the latter. It still is paying for them at the rate of hundreds each month.

From every state came the requests for literature, most of them from prospective home owners but not a few from Architects, schools and colleges, among the latter, Harvard, Purdue, Ohio State, Wisconsin, Illinois and McGill Universities, where "BRICK, How to Build and Estimate" now is used as a reference book.

If doubt ever existed in the minds of Architects regarding the public's interest in the Brick home, the nation-wide response to Common Brick advertising should dispel it. It is a reasonable assumption that people would not pay for facts on Brick construction unless they wanted them and expected to use them. The response to our advertising, therefore, may be accepted as a true criterion of the public's deep interest in Brick construction.

Successful beyond even our most sanguine anticipations, the Common Brick campaign indicates that Architects who apply their creative abilities to the planning of Brick buildings are sure to find receptive clients.

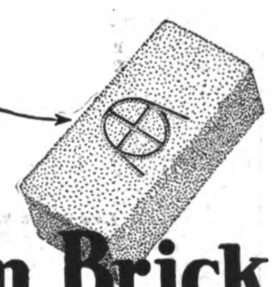
In such planning you will derive much practical help from "BRICK, How to Build and Estimate," a real ABC of Masonry work with detail drawings and tables for estimating quantities of material and labor. Sent for 25 cents in stamps.

The mark that guarantees Brick—*honestly* made and *honestly* sold

Insistence upon trademarked Common Brick for solid walls assures you of a Brick standard in quality and size — 2¼ x 3¾ x 8

THE COMMON BRICK INDUSTRY OF AMERICA
1309 SCHOFIELD BUILDING
CLEVELAND, OHIO

Demand Brick with this Trade Mark
Your Guarantee of Quality

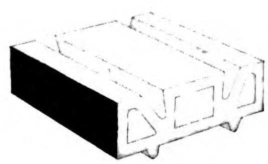


For Beauty *with* Economy *build with* Common Brick

Whether you are told to go ahead without regard to cost, or are limited to a modest sum, you'll do your client a good turn by specifying

"FISKLOCK" BRICK

HARDONCOURT-FISKE PATENTS



Beautiful Brick Houses

House of J. Cozzens
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Rouse & Goldstone
Architects

HOW TO REDUCE COSTS

Your client can build the house he desires if you explain the labor-saving and other advantages of "Fisklock" brick.

YOU won't need to tell him of the beautiful effects, the substantial appearance, the lasting qualities of brick; he knows; he wants brick.

Tell him that in the wall "Fisklock" is the same as standard face brick—same form, same size, same texture, same tints—but

A "Fisklock" house costs less than if of face brick backed by common brick, because "Fisklock" brick reduces labor cost; it combines a face brick and a common brick in one unit—8 x 8 x 2¼.

This brick has three horizontal spaces or "dead-air" cells for heat insulation. It has moisture checks which prevent water working through mortar joints.

"Fisklock" brick is the architect's solution to building problems because—

It's not what brick costs per thousand, but what it costs in the wall

FISKE & COMPANY, Inc.

BOSTON, MASS.

NEW YORK **WATSONTOWN, PA.**

"Tapestry" Brick ***Face Brick*** ***Fire Brick***

CLOISTER BRICK

THE soft velvety texture and the warm mellow tones of Cloister Brick give a character and charm to the finished wall which every architect seeks.

Cloister Brick resembles closely the materials in the cloister walls of the old Spanish Missions of California. They are offered in four shades from the warm brown tones, through the intermediates, to a bright red.

These beautiful brick are made from a mixture of certain shales and given special treatment in moulding and burning.

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THE STUCCO OF PERMANENT BEAUTY

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Those who appreciate Hoffman type Casement Windows most are nurses, doctors and health officials.

They realize, perhaps more than anyone else, the many advantages of this particular window —

— which gives ventilation without draft.
— which opens easily to any desired position.
— which can be easily cleaned from inside the room without removing hangings, curtains or screens.
— which remain so firmly in position that they cannot fall out or blow off and yet operate so easily and quickly that if a storm comes up they can be closed in a second.

Health and happiness are so dependent upon good ventilation that anyone interested in hospital construction will be pleased to receive our picture book, showing Hoffman installations and our catalog, which illustrates the many Hoffman advantages.

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NO. 8

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These are recommended for their rich, warm tone and their attractive texture.

Especially recommended for distinctive exterior and interior construction, where only the highest class of architecture can be achieved; where quality and color scheme are most essential and above all cost an after-consideration.

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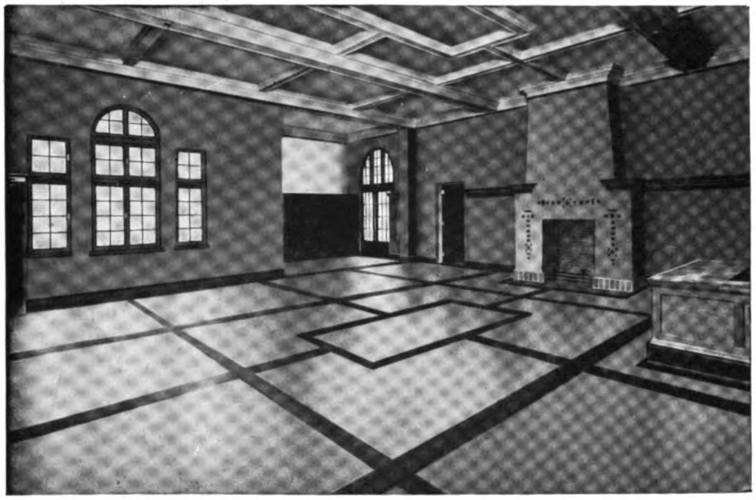

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Hygienic, Durable, Fireproof

Floors are the most used and most abused portions of every building and demand that only the best flooring material be specified.

ASBESTONE Composition Flooring is an ideal flooring for all interior purposes. It is recognized to be the most perfect Hygienic, Fireproof, Durable flooring that is installed plastic, presents a monolithic surface, smooth, jointless and artistic, is easy to keep clean, noiseless, resilient and easy to the tread.

ASBESTONE Composition Flooring is not cold or hard, like marble or tile, does not check or warp like wood. Its low cost of installation and lasting qualities make it of special interest to architects, medical men, property owners, etc.

ASBESTONE can be installed over either new or old cement or wood, and can be supplied in a variety of artistic colors.

Specify ASBESTONE and insist on its installation. Installations made in all parts of the world.

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It's Different Try It!

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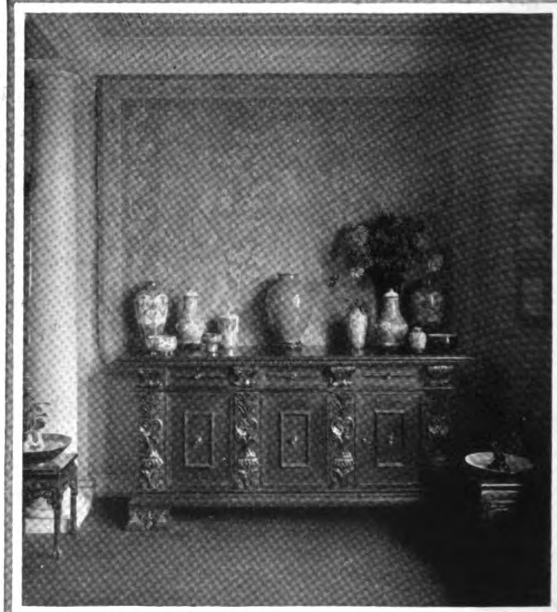

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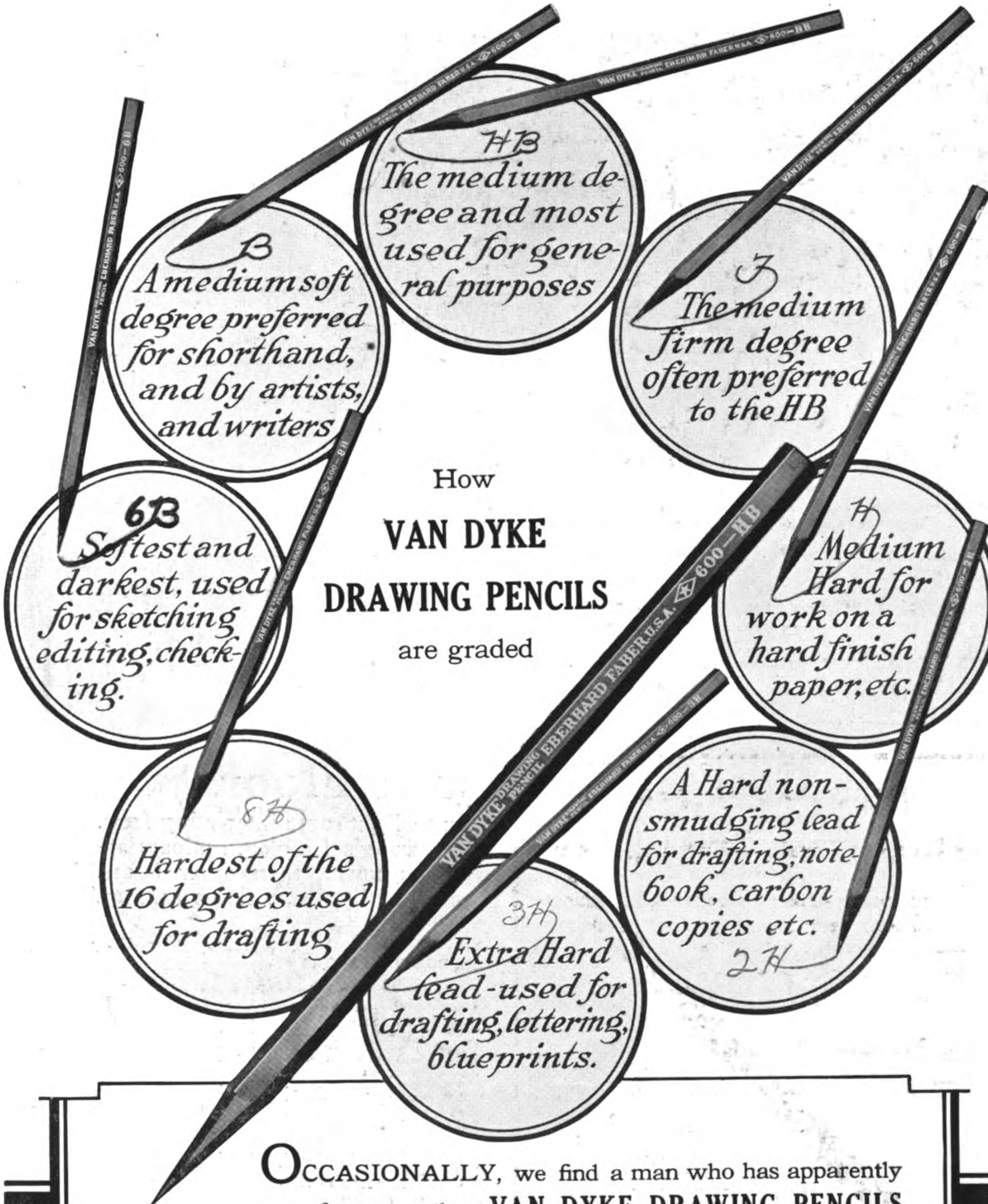
HB
The medium degree and most used for general purposes
B
A medium soft degree preferred for shorthand, and by artists, and writers
F
The medium firm degree often preferred to the HB
6B
Softest and darkest, used for sketching editing, checking.
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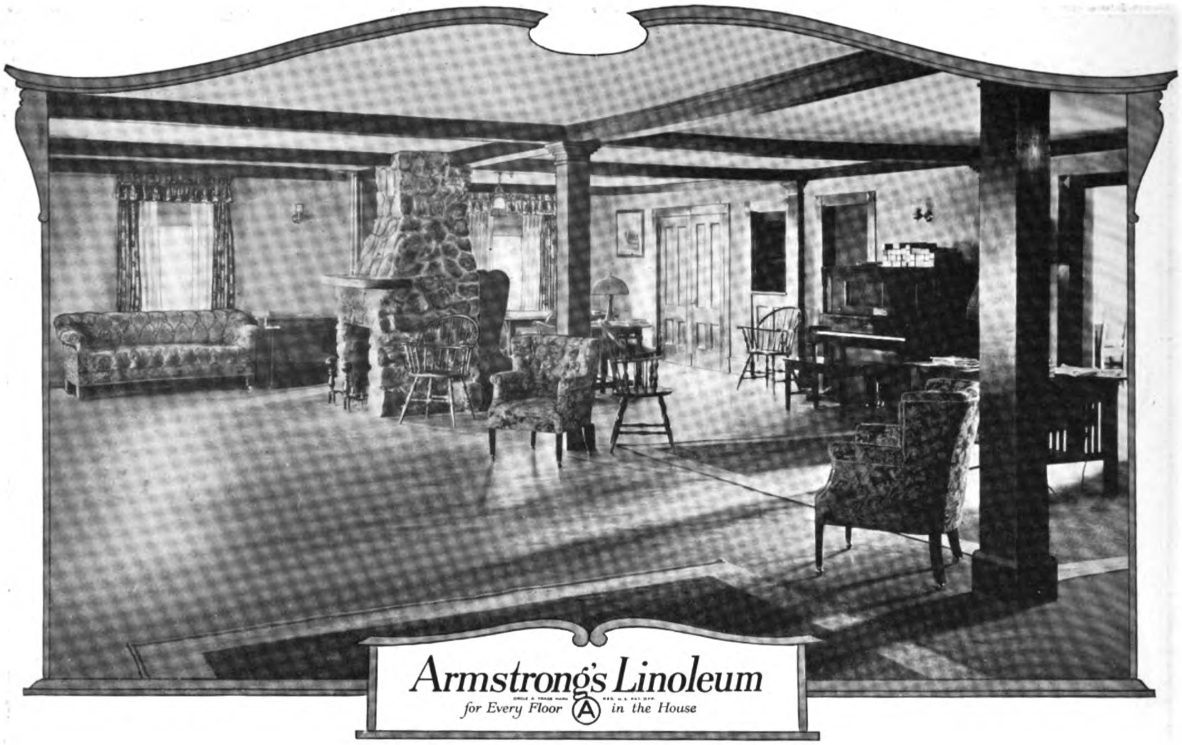
DRAWING PENCILS
are graded
H
Medium Hard for work on a hard finish paper, etc.
8H
Hardest of the 16 degrees used for drafting
A Hard non-smudging lead for drafting, note-book, carbon copies etc.
2H
3H
Extra Hard lead-used for drafting, lettering, blueprints.
VAN DYKE DRAWING PENCIL EBERHARD FABER U.S.A. 600—HB



A floor of Armstrong's Plain Brown Linoleum in the Ferguson Hotel, a quaint New England resort in Hyannis, Mass.

Compare the Cost of Linoleum Floors

A COMPARISON of floor costs brings to light some interesting facts. The following table shows that Armstrong's Linoleum Floors are as low in first cost, and in many cases lower, than other floors, lacking the particular advantages of permanent linoleum floors *cemented down over deadening felt paper:*

BUSINESS FLOORS	*Cost per sq. ft. cemented over felt paper*
Battleship Linoleum	
1/4-inch brown	**$ .45**
1/4-inch green	**.49**
1/4-inch gray	**.49**
3/16-inch brown	**.34**
3/16-inch green	**.36**
3/16-inch gray	**.36**
Parquetry Inlaid Linoleum	**.38**
Hamilton Straight Line Inlaid	
A Grade	**.33**
Plain Linoleum—A Grade	**.30**
Jaspe Linoleum	
A Grade	**.35**
B Grade	**.31**

RESIDENCE FLOORS	*Cost per sq. ft. cemented over felt paper*
Parquetry Inlaid Linoleum	**$ .38**
Hamilton Straight Line Inlaid	
A Grade	**.33**
D Grade	**.25**
Carpet Inlaid Linoleum	**.26**
Plain Linoleum—B Grade	**.27**
Jaspe Linoleum	
A Grade	**.35**
B Grade	**.31**
Granite Linoleum	**.30**
Printed Linoleum	
D Grade	**.21**
E Grade	**.20**

Terrazzo	***$ .80***	***Composition***	***$ .45***
Marble	***$1.50 to 2.00***	***Tile***	***$1.00 to 1.75***
Oak Flooring, 3/8-inch	***$ .46***		

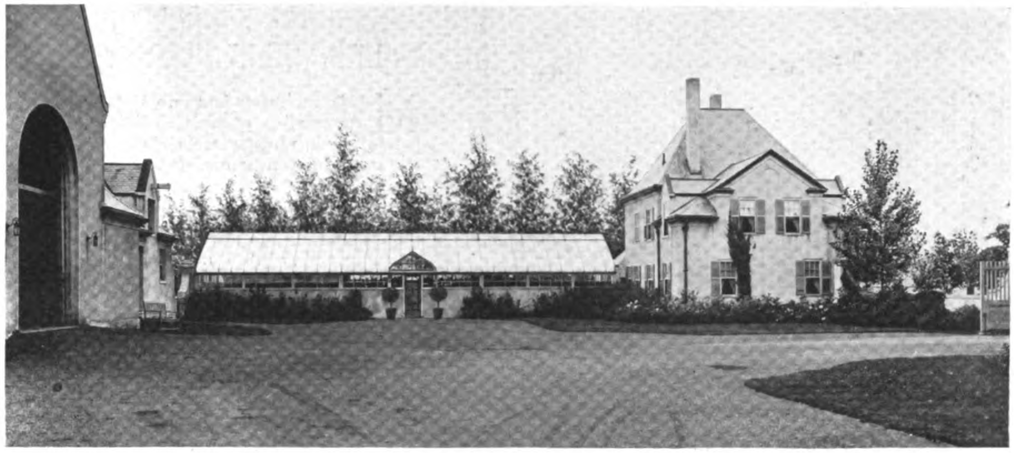
The above figures were based on prices current in Lancaster, Nov. 15, 1920

The architect who is not thoroughly familiar with modern linoleum floors will further his own interests, as well as his clients', by making a thorough investigation of this subject. The double-tone Jaspe effects, the new Inset Tiles, and the soft, pleasing Plain colorings of Armstrong's Linoleum permit a wide latitude in decorative treatment while the inherent qualities of the material assure a warm, quiet, durable floor.

A new edition of "Armstrong's Linoleum Floors," just off the press, takes up all these points in detail. This book is published in the convenient form recommended by the American Institute of Architects, and contains, in addition to tables of gauges and weights and other information of specific interest to architects, colorplates of fine interiors and lithographs of modern linoleums in full scale. A copy is yours for the asking.

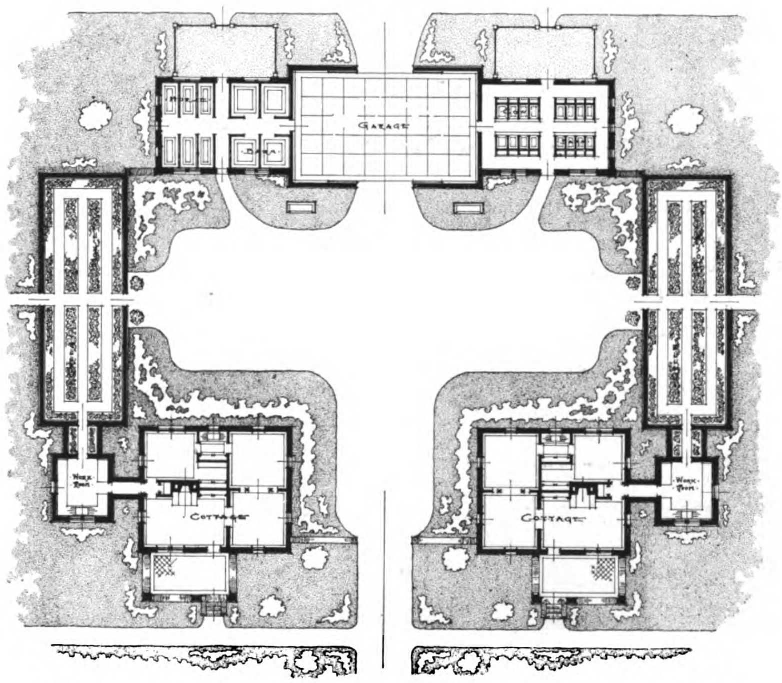
Armstrong Cork Company, Linoleum Department, Lancaster, Pa.

(CUT ALONG THIS LINE AND FILE)



·TREATING·THE·FARM·GROUP·ON·A·BUSINESS·BASIS·

V-BAR·GREENHOUSE
DATA·SHEETS
NO·12·OF·THE·SERIES



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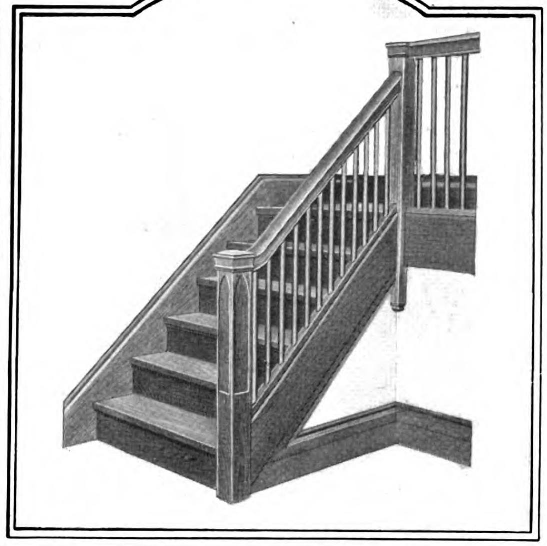

Stairways to More Business

IF you could find a stair that would fit in perfectly with your plans for one home, how much time would you save in work upon that one detail on that one job ?

If the above is not precisely the stairway you need, there are many other Curtis Standard Designs for you to choose from. There are also doors, mantels, permanent furniture, sash and bay and dormer windows, interior trim and exterior moldings which lend the accent of individuality to homes.

These new Curtis Standard Designs are the result of the co-operation with us of distinguished architects—Trowbridge & Ackerman of New York. Their know-how has been added to our know-how in producing woodwork in good taste, woodwork eminently suited for most of your plans.

If you would broaden the field of your activities among home-builders of more taste than means, ask us upon you letterhead in regard to this new development of Curtis Standardized Woodwork.

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The makers of CURTIS Woodwork guarantee complete satisfaction to its users. "We're not satisfied unless you are

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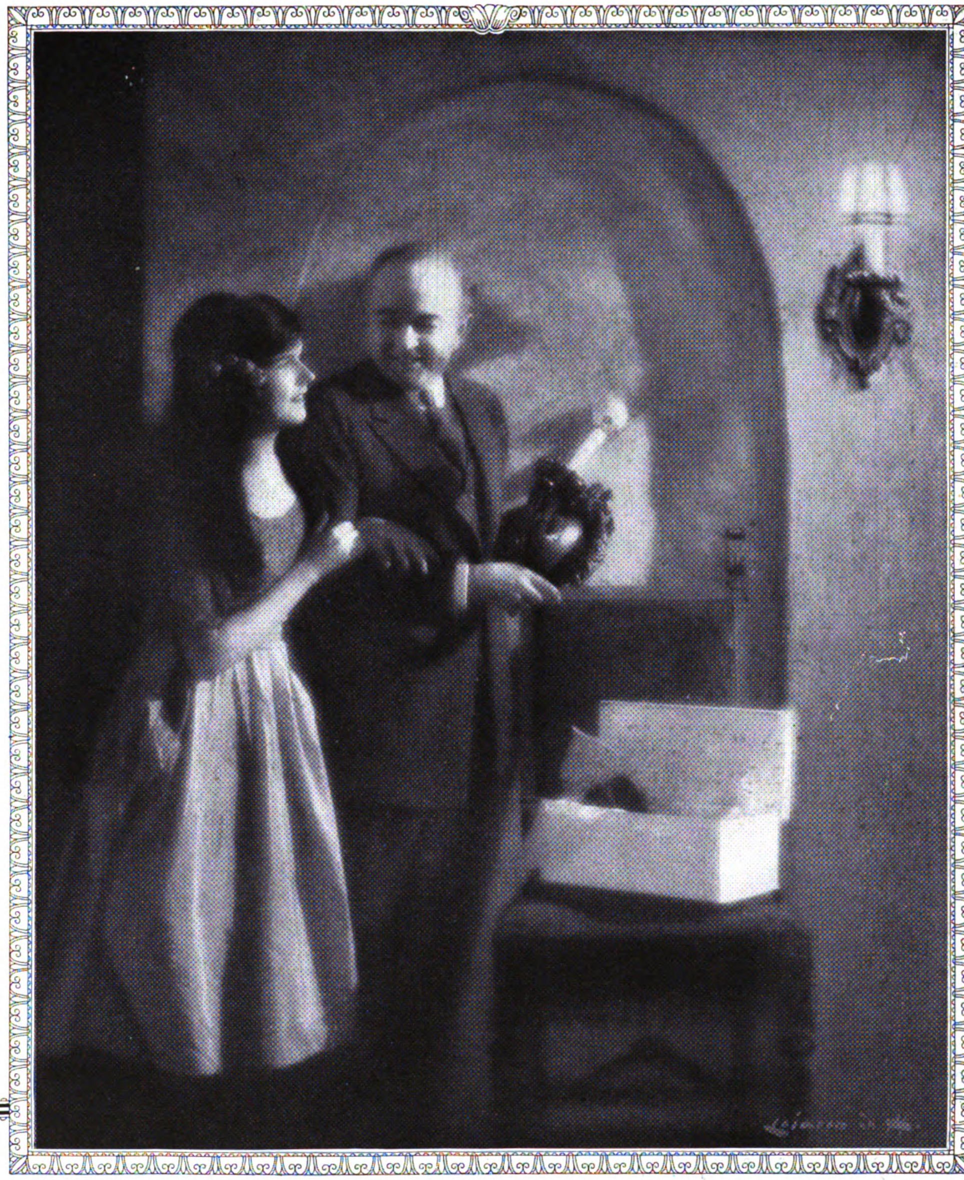

Getting ready for the party

Elexits

"Places for Lights"

THE FINISHING touches before the guests arrive! A bowl of flowers placed here—a chair moved a little there! And that dark corner brightened up by plugging the new wall fixtures—which "dad" just brought—into two of the numerous and convenient "places for lights."

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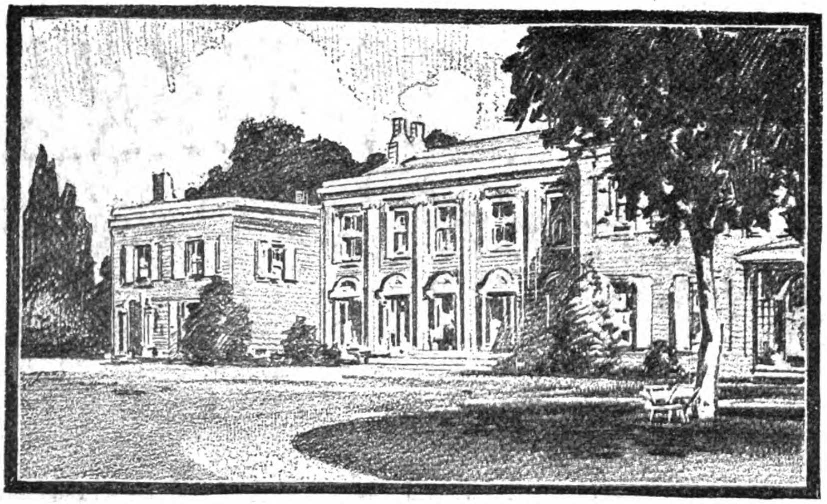
This picture enlarged on heavy mat paper with caption, furnished ready for framing upon receipt of $5.00. Send check with order.



Residence Wiring

MOST old houses are found to be "underwired," when modern household appliances are introduced. They have not been provided with sufficient outlets, or the wires are not heavy enough to carry this new load.

When you plan the wiring layout, consult a reputable consulting engineer or electrical contractor. Insist on well placed receptacles in every room, 3-way switches for cellar and attic lights, plenty of light in all parts of the house and wires heavy enough to carry current for all the household conveniences now so increasingly popular.

The wiring device catalog, soon to be issued, will suggest many refinements in choice of devices you might not otherwise think of. Have you sent us your application for a copy?

The name General Electric Company on an electrical device is a guarantee of quality backed by over a quarter-century's experience in the generation, transmission, distribution and application of electricity.

G-E RELIABLE WIRING DEVICES

Can be furnished by any reputable electrical contractor

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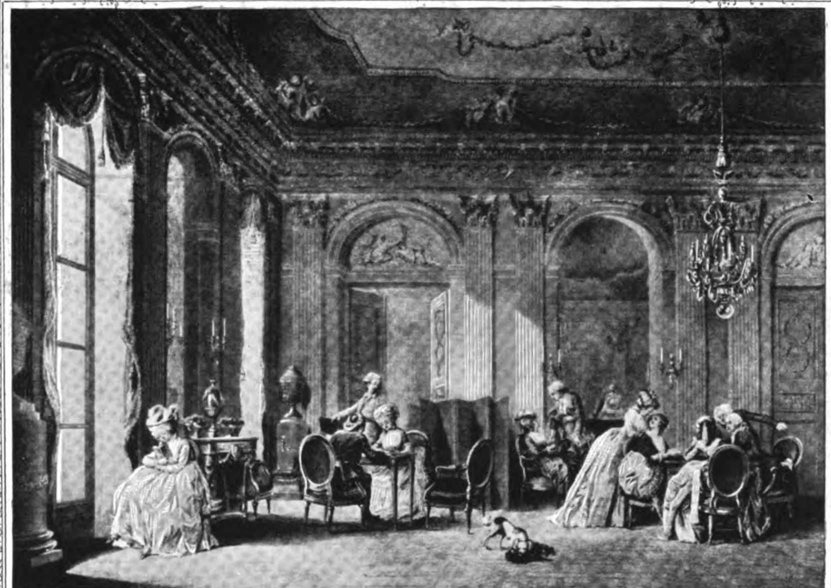


L'Assemblée au Salon. An engraving by Deguevauviller from the painting by N. Lavreine

The Genesis *of the* Modern Drawing Room

ANCESTORED at once by France and by England, through Grand Salon as by family sitting room, the modern drawing-room is the product of sources which, widely differing, owe their origin to a single root.

The Drawing-Room sprang from the Great Hall (the "Grande Salle," as it was called in France) where Barons and their retainers roystered and from whose freer pleasures the ladies at some time found it convenient to withdraw. Thus in England came the Withdrawing Room which, originally the bedchamber of Lord and Lady, came later to be screened off and apportioned to the Lady and her damsels.

Parallel with this development came that in France—and here we see the nobleman ceremoniously disporting himself in his Grande Salle, and more socially in his bedroom. Then, to this latter room came to be introduced, after the example set by Italy, the Cabinet. And from these rooms it was that, at the beginning of the 18th century, came the definite divisions, Salon de la Compagnie and Salon de la Famille—the last becoming the family apartment, like the English drawing-room.

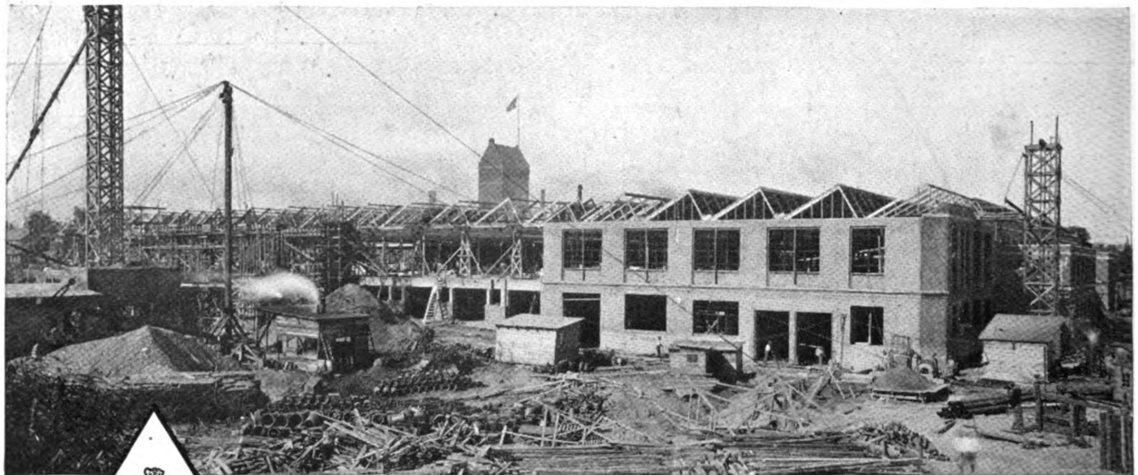
The drawing-room at its most beautied supremity was probably represented by the Grand Salon of the Court of Louis XV. Here it was at its most stately and vivacious phase—though lacking the caprice, the intimacy of the modern drawing-room. This latter, with its soft color, the informality of its arrangements, and its beautiful investitures of decorative art has more and more combined the beauty of the Salon de la Compagnie with the comfort of the Salon de la Famille; and in this development of decorative beauty as of humanizing influence, silks have borne their satisfying share.

In this regard, too, it may be truly said that the beautiful decorative silks produced by Cheney Brothers—particularly those typical of the various Louis periods—have entered importantly into the development of the drawing-room as we know it in America today

CHENEY BROTHERS

4th Avenue at 18th Street, New York

CHENEY SILKS



CLOTHCRAFT SHOPS (JOSEPH & FEISS CO.), CLEVELAND, OHIO
Lockwood-Greene Co., Chicago, Architects
Stone & Webster, Inc., Boston, Contractors
Carney's Cement was used for brick mortar

CARNEY'S CEMENT

The Bond That Guarantees The Wall

Preference –and the Reason

PROMINENT buildings in which Carney's Cement has been used link together the names of the leading architects and contractors of the country.

It goes without saying that these men have used or specified Carney's Cement because they *prefer* it—because it does things that other mortars do not do.

"The Bond That Guarantees The Wall"

No other cement mortar can stand indefinitely after being soaked. Carney's can be left over night in the mortar box, retempered in the morning merely by adding water, and used with just as good or better results. Carney's is a no-waste cement.

The plasticity and smooth-working qualities of Carney's Cement allow the mason to work faster and with less effort. The contractor gets more work from his men; the owner gets a better wall at a lower cost.

The natural plasticity makes it unnecessary to add lime, while the addition of more sand than specified interferes with the working properties of the mortar under the trowel. This automatic check guarantees a proper mix, a hard, durable bond, and walls of solid masonry.

Specification: 1 part Carney's Cement, 3 parts sand, no lime

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CARNEY'S CEMENT
For Brick and Tile Mortar

As Good as New

Residence of Edward Weitz, Des Moines, Ia. Vorse, Kraetsch & Kraetsch, Architects. Chas. Weitz Sons, General Contractors.

FRESH and bright as if finished yesterday—but this attractive home was built five years ago. What's the secret? Notice the mortar joints. They're as clean-cut and white as the day they were laid. And the flower vases, trim and spotless, play their part.

Medusa Stainless Waterproofed White Cement—that's the answer.

Face brick laid in that material was specified by the architects, Messrs. Vorse, Kraetsch & Kraetsch of Des Moines. The foundation walls were back-plastered with cement waterproofed with Medusa Waterproofing Paste. The work was done by Chas. Weitz Sons, Contractors.

The stainless quality and permanence of Medusa products recommend them to architects and builders of fine structures. We'll gladly aid in making up the cement specifications. The Medusa Cement booklets describe the products fully.

THE SANDUSKY CEMENT COMPANY

Department F — Cleveland, Ohio

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If among the many stock styles of Afcco Fence you don't find something especially fitted to meet your most exacting demands, you *will* find us ready to build to your design.

The construction of Afcco Fence embraces every modern detail that assures the maximum durability and service, without detracting in any way from its pleasing design.

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American Fence Construction Co.
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The result required is a coating which is white, light-diffusing, fire-retarding, and which holds firmly and permanently to the surface.

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The cost — is about 50c. per gallon.

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The Best White Paint

CROWN PAINT
Ready Mixed or Semi-Liquid

COLORS IN OIL, ALSO JAPAN AND DISTEMPER

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For all Purposes

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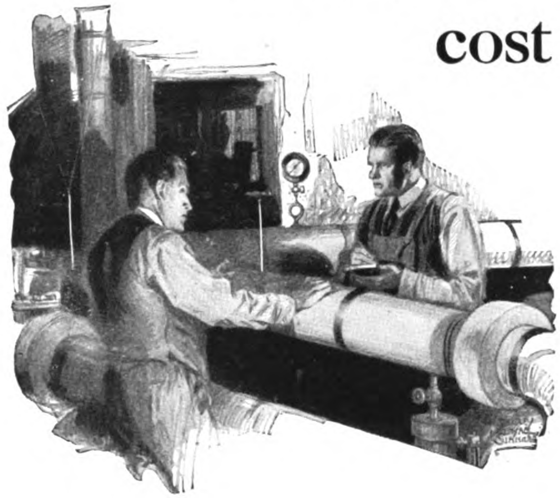
Established 1844 **PHILADELPHIA**

Low pulse and high fever cost fuel users millions



How much is lost heat from steam lines costing me?

Not long ago fuel users might ask in vain for the answer. Today everyone can know and save fuel through proper insulation correctly applied. Instruments for determining pressures and temperatures; charts and extended calculations are the tools that Johns-Manville Insulation Service is using to answer this very practical business question.

Whether you burn fuel in the house, the factory or the power plant, read what the science of insulation has accomplished.

TWO symptoms always signal heat loss from a steam-pipe. One is lowered pressure in the pipe, the other is high temperature of the air surrounding the bare or poorly insulated pipe.

Now this falling of the pulse and external fever means that fuel in the form of heat is being lost.

It is Insulation's job to minimize this. And so well is this being done by the Johns-Manville Insulation Service that the materials applied are paying for themselves by the heat they save.

This kind of Heat Conservation has become a science.

In past years little was known of the real truths of heat loss. Materials were recommended after inadequate tests; in fact, today if many of the steam pipes covered sometime ago with materials of unknown value were checked up, their covering would be replaced by insulation of known value, and new records for economy set up.

Rising fuel prices make heat losses doubly serious and economy in heat transmission has been realized to be a real factor in cutting heating, power and manufacturing costs.

Changing the physical design of Insulation

An insulation to be of maximum value must have more than the property of preventing heat loss. It must also have physical durability, for a short-life material means early replacement, so that if insulation values are equal, the most durable insulation is the most economical.

It it is desirable to reduce a loss, it is surely advisable to reduce the loss to a minimum. Believing this, Johns-Manville developed physically strong-felted insulations—and with obvious advantages to the fuel user. For these felted insulations are built up in ply form, physically strong and not easily damaged by vibration, handling or rehandling. These improved materials have not only overcome the physical shortcomings of most insulations, but made higher heat efficiencies possible. In fact, on test, one of these insulations has repeatedly been shown to be the most efficient commercial material in existence.

Insulation for every service

No one material should or will serve all practical needs. Steam service where high pressures are used demands different treatment than cold water or brine service. Johns-Manville, in realization of this, offer materials suitable for use indoors and out; overhead and underground and for every type of system, and not only does this service include the furnishing of the materials but their application as well.

The application of an insulation is vital to its performance in service, hence the necessity of controlling this factor if economical results are to be obtained.

Johns-Manville Insulations

Asbesto-Sponge Felted, 85% Magnesia, Asbestocel, Zero, Anti-Sweat and Ammonia Insulation, Underground Conduit Insulation and Insulating Cements.

Efficiencies of
JOHNS-MANVILLE ASBESTO-SPONGE FELTED INSULATION ON 5" PIPE

Thickness in Inches	*Temperature Difference Degrees Fahrenheit* 100°	200°	300°	400°	500°
1"	83.8%	86.2%	88%	89.8%	91.2%
2"	88.6	90.3	91.6	92.8	94.1
3"	91.1	92.5	93.5	94 5	95.4

What Insulation Efficiency Means

90 per cent efficiency,—for instance,—means that the insulation of that efficiency saves 90 per cent of the heat that would be lost if the insulation were not applied.

Example:

One hundred feet of uncovered 5" pipe conveying steam at 150 pounds pressure through a room whose temperature is 70° F. *loses* 1,222,000,000 B. t. u. (units of heat) per year. An insulation 90 per cent efficient *saves* 90 per cent of this loss, or 1,099,800,000 B. t. u. (units of heat).

The equivalents of this *loss* and *saving* in pounds of coal are: LOSS—122,200 lbs., or 61.1 tons coal; SAVING by Insulation—109,980 lbs., or 55 tons coal.

The figures on pounds of coal lost due to uninsulated pipe and saved by use of insulation are based on continuous operation, 24 hours per day, 365 days per year and 10,000 B. t. u. available per pound of coal.

To show the great flexibility of felted insulation, so vital to long life. Nothing to break, crack or powder off as in molded materials.

JOHNS-MANVILLE
Incorporated
Madison Ave. at 41st St., New York City
10 Factories — Branches in 64 Large Cities
For Canada:
CANADIAN JOHNS-MANVILLE CO., Ltd.
Toronto

JOHNS-MANVILLE SERVICE
COVERS THE CONTINENT
Through—
Asbestos
and its allied products
INSULATION
that keeps the heat where it belongs
CEMENTS
that make boiler walls leak-proof
ROOFINGS
that cut down fire risks
PACKINGS
that save power waste
LININGS
that make brakes safe
FIRE PREVENTION PRODUCTS

JOHNS-MANVILLE
Serves in Conservation

THE ARCHITECTURAL FORUM

VOLUME XXXIII NUMBER 6

CONTENTS for DECEMBER 1920

PLATE ILLUSTRATIONS

LETTERPRESS

ALBERT J. MacDONALD, Editor

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Trade Supplied by American News Company and its Branches. Entered as Second Class Matter, March 12, 1892, at the Post Office at Boston, Mass.

The editorial and general offices of ROGERS AND MANSON COMPANY, Publishers are now located at 142 Berkeley Street, Boston 17, Mass.

Residence of J. C. Fahey, (Guilford) Baltimore, Md. Wm. D. Lamdin, Architect. Bishopric Stucco Board used on Exterior.

BISHOPRIC
STUCCO AND PLASTER BASE

BISHOPRIC insulates against loss of heat by providing a dead air space in the construction. The asphalt mastic and the creosoted wood strips withstand DAMPNESS and are WATERPROOF. BISHOPRIC insures PERMANENCE by reason of the dovetailed wood strips which clinch the stucco. BISHOPRIC is STRONG, having withstood tests. BISHOPRIC is RESISTANT against FIRE, VERMIN, DECAY, because of the nature of its material.

A post card from the architect will bring him, "Built on the Wisdom of Ages," a booklet descriptive of BISHOPRIC with explanation of practical considerations, economic and labor saving qualities. It contains specifications for the use of BISHOPRIC stucco and plaster base and BISHOPRIC sheathing, which may be used as sheathing, as subflooring or roofing boards. The tables give weights and sizes.

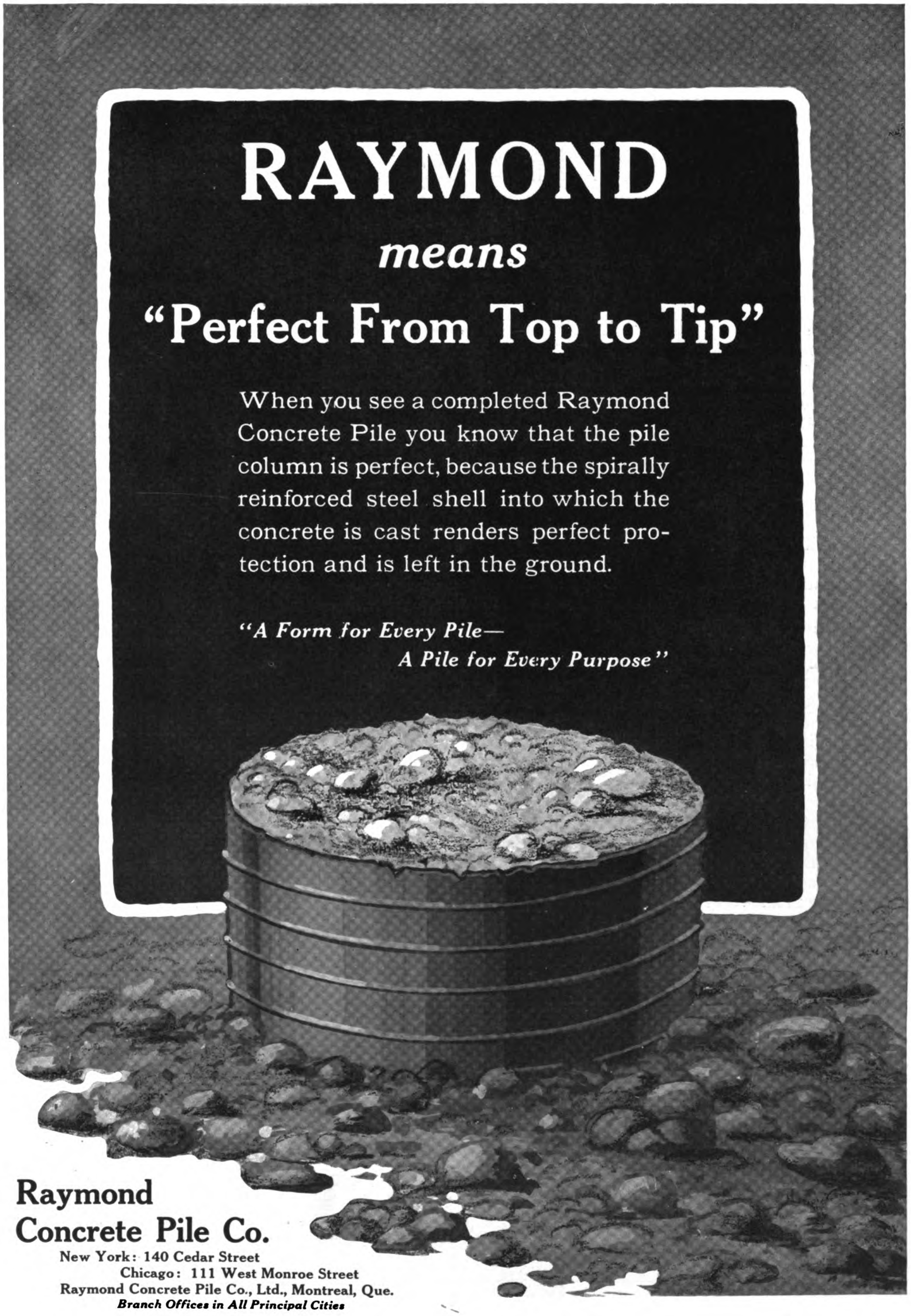
SEE OUR CATALOGUE IN SWEET'S

THE DOVETAILED KEY INTERLOCKS THE PLASTER
BISHOPRIC STUCCO AND PLASTER BASE
TRADE MARK REGISTERED

THE BISHOPRIC MANUFACTURING CO.

103 Este Avenue - Cincinnati, Ohio

Factories: Cincinnati, Ohio, and Ottawa, Canada


RAYMOND
means
"Perfect From Top to Tip"
When you see a completed Raymond Concrete Pile you know that the pile column is perfect, because the spirally reinforced steel shell into which the concrete is cast renders perfect protection and is left in the ground.
"A Form for Every Pile—
A Pile for Every Purpose"
Raymond
Concrete Pile Co.
New York: 140 Cedar Street
Chicago: 111 West Monroe Street
Raymond Concrete Pile Co., Ltd., Montreal, Que.
Branch Offices in All Principal Cities

Manufacturers' Catalogs and Business Announcements

ANNOUNCEMENTS

Mr. James G. Mackenzie, Jr., architect, announces the removal of his office from 15 East 40th street to 4 East 39th street, New York City.

Mr. Edwin F. Simpson and Mr. Rolland L. Githens announce the formation of a partnership for the practice of architecture with offices at 869 Reibold Bldg., Dayton, Ohio.

The partnership heretofore existing between Walter F. Ballinger and Emile G. Perrot, trading as Ballinger & Perrot, has been dissolved. The business will be succeeded to and continued by Walter F. Ballinger, trading as The Ballinger Company.

Messrs. Shaw & Hepburn announce the removal of their offices to 24 Mt. Vernon street, Boston, Mass.

Resolutions were adopted by the Executive Committee and Advisory Board of the National Pipe and Supplies Association at their fall meeting, held in New York on Thursday, November 11, accepting the terms employed by the American Society for Testing Materials in differentiating between iron and steel pipe. In distinguishing the variety of pipe as welded, drawn, cast, etc., it is recommended that the designation "wrought" which has crept into the pipe industry in the sense of making or forming by labor shall apply only to that well known method of preparing iron as a material.

CATALOG REVIEWS

THE HOLLOW BUILDING TILE ASSOCIATION, Conway Building, Chicago, Ill.
"Handbook of Hollow Tile Construction" (8½ x 11 ins.). 110 pp.

The leading manufacturers of hollow tile united for the purpose of producing a nation wide building tile of high standards submit this substantial book as a guide to its uses. From bonding to the fireproofing of structural steel, the extensive employment of this material is shown, both in place of and with other types of construction and also as the sole element of building. Practically all of the problems that the user of hollow tile might face are eliminated by the clearly reproduced details and explanatory text. Under the trade mark "Mastertile" are embraced variety enough of pattern and shape to produce structures of any class. Besides the many things that are expected to be found in a handbook of this sort, there are model specifications, definitions of terms of the trade, characteristics of hollow tile and a request to take advantage of the association's research department.

"Hollow Tile for the Home" (8 x 10½ ins.). 48 pp.

A pictorial account of the work in which hollow tile has been used and a discussion of materials and conditions. "Mastertile" is shown in detail drawings, and sectional walls and photographic illustrations display executed houses in many styles. The entire layout is one that is directed toward and would be of interest to the layman who is about to build.

ARCHITECTURAL AND BUILDING CODE SERVICE, NATIONAL LUMBER MANUFACTURERS ASSN., 750 McCormick Bldg., Chicago, Ill.
"Frame Construction Details" (8½ x 11 ins.).

A welcome volume makes its appearance in the form of a series of plates devoted to the wooden structure or more properly its structural parts. Many designers have felt the need of such a book and have not known where to obtain one. The examples set are sponsored by an able staff who would naturally be the most fitted to attempt this sort of work. The details are classified by types and their component parts as the "balloon frame," "braced frame" and "Western frame." Minor points are clearly shown, sizes are at once apparent, all cuts are readily understood and such work as fire-stopping is complete at every point. The aim of the compilers is to give the efficient as well as the economical practices which will make a helpful reference to estimators. Copies of the book may be secured from the above address at a cost of one dollar each.

THE MAGNESIA ASSOCIATION OF AMERICA, Secretary, Bulletin Building, Philadelphia, Pa.
"Defend Your Steam" (8 x 11 ins.). 80 pp.

Opening with a short recognition of James Watt's part in the development of "heat work," this book contains an extensive treatise on the protection of steam as applied to power and heating. The scientific work of the Mellon Institute of Industrial Research in co-operation with the above association in checking the insulation properties of magnesia records tables, diagrams and data for the use of architects and engineers. Following a dissertation on the advantages of "85% Magnesia" as a material, many very convincing installations of this material are shown. Durability of this agent as a pipe and boiler covering is made a stellar point through the declaration of important tests by such authorities as the U. S. Bureau of Mines. A list of notable users of "85% Magnesia is appended."

The *Western Electric* Flip Switch Embodies Every Desirable Feature

For instance:

There are no screws to mar the face of the plate or collect dust and dirt.

It has a beautifully designed lever in place of the two unsightly push buttons on the ordinary switches.

Switch is self-indicating and easy to operate. When lever is up, the lights are on; when lever is down, lights are off.

It lines up true with the wall even when switch box is on a slight angle.

It is these many desirable features, in addition to the perfect mechanical and electrical construction of Western Electric Flip Switches which have influenced many architects and electrical engineers to specify them for their important work.

Western Electric Company

Offices in All Principal Cities

Everything Electrical for Office, Factory, Home and Farm

Selected List of Manufacturers' Literature

FOR THE SERVICE OF ARCHITECTS, ENGINEERS, DECORATORS AND CONTRACTORS

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

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

BOILERS—See Heating Equipment

BRICK

American Enameled Brick and Tile Co., 52 Vanderbilt Avenue, New York.
Enameled Brick. Circular. Illustrated.

American Face Brick Association, 1151 Westminster Bldg., Chicago, Ill.
The Story of Brick. Booklet. 7 x 9¼ in. 55 pp. Illustrated. Presents the merits of face brick from structural and artistic standpoints. Tables of comparative costs.
The Home of Beauty. Booklet. 8 x 10 in. 72 pp. Color plates. Presents fifty designs for small face brick houses submitted in national competition by architects. Text by Aymar Embury II, Architect.

Bradford Brick Co., 2 Main Street, Bradford, Pa.
"Red" Catalog. 7⁵⁄₁₆ x 5 in. 30 pp. Illustrated. Covers dry pressed and impervious smooth-faced brick.

Common Brick Manufacturers Association of America, 1309 Schofield Bldg., Cleveland, Ohio.
Brick for the Average Man's Home. Book. 8½ x 11 in. 72 pp. Color plates. Book of plans for bungalows, houses and apartments for which working drawings are available Price $1.00.
Brick—How to Build and Estimate. Book. 8½ x 11 in. 48 pp. Illustrated. A manual for the brick builder on estimating and details of brick construction. Price 25c.

BUILDING STONE—See Stone Building

CEMENT

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

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

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

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

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

CONDUIT

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

CONSTRUCTION, FIREPROOF

Bostwick Steel Lath Co., The, Niles, Ohio.
After The Fire. Booklet. 6 x 9 in. 13 pp. Illustrated. Showing the fire-resistance of Bostwick "Truss-Loop."

General Fireproofing Co., The, Youngstown, Ohio.
Fireproofing Handbook. Catalog. 6 x 9 in. 112 pp. A book dealing with the problems of fireproof construction, using as a basis the reinforcing materials—Self-Sentering, Trusset and Expanded Metal.
General Fireproofing. 8½ x 11 in. 16 pp. House organ issued monthly.

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

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

Republic Fireproofing Co., 26 Cortlandt Street, New York.
Republic Fireproofing Construction for Buildings. Booklet. 8½ x 11 in. 28 pp. Illustrated. A complete description on the two-way construction, its lightness, distribution of loads, saving of loads, saving in structural steel or concrete and its general adaptability to Fireproof Construction.

DAMPPROOFING

Truscon Laboratories, The, Caniff Avenue and Grand Trunk R. R., Detroit, Mich.
Truscon Stonetex. Booklet. 5 x 8 in. 36 pp. Illustrated. A booklet telling of methods to decorate and make brick, stucco and masonry free from stains by the application of a cement coating.

DOORS, WINDOWS AND TRIM, METAL

Dahlstrom Metallic Door Company, 425 Buffalo Street, Jamestown, N. Y.
Architectural Catalog. 10 x 14 in. 46 pp. 11 sections. Illustrated. Catalog showing our regular styles and types of hollow metal doors and interior trim. Various types of frames and other architectural shapes also illustrated.

Merchant & Evans Co., 2019 Washington Avenue, Philadelphia, Pa.
Evans "Almetl" Fire Doors and Shutters. Catalog. 8½ x 10¾ in. 24 pp. Describes the entire line including "Star" Ventilators.

DOORS, WINDOWS AND TRIM, WOOD

Curtis Service Bureau, 6034-7034 S. Second Street, Clinton, Iowa.
Architectural Exterior and Interior Woodwork, Standardized. Catalog. 9 x 11½ in. 238 pp. Illustrated. Covers a complete line of architectural woodwork, standardized both as to designs and sizes. Builders are requested to apply through their dealer.

Reliance Fireproof Door Co., 47 Milton Street, Brooklyn, N. Y.
Reliance Fireproof Doors. Catalog. 6¾ x 9¼ in. 44 pp. Illustrated. Contains details of door and window construction, including molding and trim dies.

DUMBWAITERS

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

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

ELECTRICAL EQUIPMENT

General Electric Co., Schenectady, N. Y.
G. E. Specialty Catalog. 3¼ x 4½ in. 210 pp. Illustrated. Pocket size descriptive booklet with cloth binding. Gives dimensions, catalog numbers, capacities, package weights, etc., of a complete line of essential wiring devices.
Novalux. Booklet. 8 x 10½ in. 36 pp. Illustrated. Ornamental street lighting units.
Standard Unit Switchboard Panels. Booklet. 8 x 10½ in. Illustrated. An index to types of standard unit panels for large and small plants, alternating current and direct current, giving references to descriptive bulletins on each type.

Habirshaw Electric Cable Company, Inc., 10 East 43d Street, New York.
Plans and Specifications for the Home Electrical. Catalog. 11 x 14 in. 20 pp. Rubber, oiled paper, varnished cambric insulated wires and cables for every condition of service.

Prometheus Electric Co., 511 West 42nd Street, New York.
Electrical Equipment. Booklet. 6 x 9 in. 5 pp. Illustrated. Electric plate warmers, sterilizers and mechanical heating devices.

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

Western Electric Co., 195 Broadway, New York.
Western Electric Electrical Supply Year Book. Catalog. 6½ x 9½ in. 1248 pp. Illustrated. Listing equipment for every electrical need for homes, institutions, office buildings and industrial plants. Prices for estimating included
Western Electric Flip Switches. Folders. Illustrated. Listing a complete line of lighting switches operated by levers thrown up or down
Western Electric Decorations for Duplexalites. Bulletin L-1. 6½ x 9½ in. 8 pp. Illustrated. Listing a great variety of shades and decorations in parchment, silk, etc., for standard Duplexalites.

ELEVATORS

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

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

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

FENCES

American Fence Construction Co., 106 Church Street, New York.
Afeco Factory Fences. Booklet. 9 x 12 in. 32 pp. Illustrated.
Residential Fences. Booklets. 7 x 2½ in. Illustrated. A series of booklets on residential fences consisting of photographs, productions and brief descriptions.

SELECTED LIST OF MANUFACTURERS' PUBLICATIONS—*Continued from page 50*

FIRE DOORS—See Doors, Windows and Trim, Metal

FLOORING

Armstrong Cork Co. (Linoleum Dept.), Lancaster, Pa.
Armstrong's Linoleum Floors. Catalog. 8½ x 11 in. 54 pp. Color plates. A technical treatise on linoleum, including tables and specifications for installing linoleum floors.
The Artistic Possibilities of Armstrong's Linoleum Floors. Booklet. 11¼ x 16½ in. 12 pp. Color plates.
Armstrong's Linoleum Pattern Book, 1920. Catalog. 3½ x 6 in. 176 pp. Color plates. Reproductions in color of all patterns of linoleum and cork carpet in the Armstrong line.
Quality Sample Book. Three books. 3½ x 5¼ in. Showing all grades and thicknesses in the Armstrong line of linoleum and cork carpets.

Johns-Manville Co., H. W., New York City.
A Flooring That's "Made to Fit." Booklet. 3½ x 6 in. 14 pp. Illustrated. Descriptive of Johns-Manville Asphalt Mastic Flooring.

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

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

FLOOR HARDENERS

Anti-Hydro Waterproofing Co., 299 Broadway, New York.
Floor Hardening. Circular. 6½ x 8½ in. 4 pp. Describes an inexpensive method for producing permanently smooth, dustless and wearproof floors.

Sonneborn Sons, Inc., L., 266 Pearl Street, New York.
Concrete and Lapidolith. Booklet. 5½ x 8¼ in. 24 pp. Illustrated. Describing relation of Lapidolith chemical floor hardener to concrete construction.
Why Lapidolise? Booklet. 8½ x 11 in. 11 pp. Illustrated. Reasons why Lapidolith should be specified.
Lapidolith Specifications. Circular. 8½ x 10¾ in. 2 pp.

Truscon Laboratories, The, Cor. Caniff Avenue and Grand Trunk R. R., Detroit, Mich.
Agatex and Its Performances. Booklet. 8½ x 11 in. Describes the methods of hardening concrete floors by the application of a chemical which forms a new surface as hard as agate.

FURNACES—See Heating Equipment

FURNITURE

Leavens Co., Inc., The William, 32 Canal Street, Boston, Mass.
Catalog. 7 x 9 in. 200 loose leaved pp. Illustrated with wood cuts.

GARAGE CONSTRUCTION

Ramp Buildings Corporation, 50 Church Street, New York, N. Y.
The d'Humy Motoramp System of Building Design. Booklet. 8½ x 11 in. 20 pp. Illustrated. Describing the d'Humy system of ramp construction for garages, service buildings, factories, warehouses, etc., where it is desirable to drive automobiles and motor trucks or industrial tractors under their own power from floor to floor.

GLASS CONSTRUCTION

Mississippi Wire Glass, 220 Fifth Avenue, New York.
Mississippi Wire Glass. Catalog. 3½ x 8½ in. 32 pp. Illustrated. Covers the complete line.

HARDWARE

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

L. P. T. Specialty Co., 846 Builders Exchange, Minneapolis, Minn.
Details and Specifications for Counter Balanced Window Hardware. 8½ x 11 in. Illustrated with drawings and blue prints.

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

Smith & Egge Mfg. Co., The, Bridgeport, Conn.
Catalog No. 10. 6¾ x 9 in. 42 pp. Illustrated. Covers a complete line of chains, hardware and specialties.

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

Vonnegut Hardware Co., Indianapolis, Ind.
Von Duprin Self-Releasing Fire Exit Devices. Catalog 12F. 8 x 11 in. 41 pp. Illustrated.
"Saving Lives." Booklet. 3½ x 6 in. 16 pp. Illustrated. A brief outline why Self-Releasing Fire Exit Devices should be used.

HEATING EQUIPMENT

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

Abram Cox, American & Dauphin Streets, Philadelphia, Pa.
Catalog 73. 9 x 12 in. 40 pp. Illustrated. Covers the complete line.
Industrial Housing Circular. 8 x 10½ in. 12 pp. Illustrated. Modern industrial housing projects with specifications for heating equipment.
Smokeless Boiler Circular. 8 x 10½ in. 8 pp. Detailed description of the Novelty Smokeless Boiler—The boiler with the carburetor.

Gorton & Lidgerwood Co., 96 Liberty Street, New York.
Gorton Self-Feeding Boilers. Booklet. 4¼ x 7¼ in. 32 pp. Illustrated. Descriptions, specifications and prices.

Graver Corporation, East Chicago, Ind.
Hot Water Service Heaters. Booklet. 8½ x 11 in. 4 pp. Illustrated. Describing Graver vertical and horizontal service heaters which utilize exhaust steam for heating.

Kelly Controller Co., 175 W. Jackson Blvd., Chicago, Ill.
The Kelly Low Pressure Controller. Booklet. 4 x 9 in. 22 pp. Illustrated. Describing what The Kelly Controller accomplishes, its mechanical operation, and its application.

Kewanee Boiler Co., Kewanee, Ill.
Kewanee on the Job. Catalog. 8½ x 11 in. 80 pp. Illustrated. Showing installations of Kewanee boilers, water heaters, radiators, etc.
Catalog No. 73. 6 x 9 in. 35 pp. Illustrated. Describes Kewanee steel power boilers with complete specifications.
Catalog No. 74. 6 x 9 in. 35 pp. Illustrated. Describes Kewanee steel heating boilers with specifications.
Catalog No. 75. 8½ x 11 in. 6 pp. Illustrated. Specifications on Tabasco Water Heaters, Kewanee water heating garbage burners and Kewanee steel tanks.

Page Boiler Co., The Wm. H., 141 West 36th Street, New York.
Page Boilers. Catalog. 4½ x 8 in. 84 pp. Illustrated. Descriptions, specifications and methods of installing Page Round and Square Sectional Boilers.
Monarch Smokeless Boilers. Circular. 8½ x 11 in. Illustrated. Describing the Monarch Down-draft Smokeless Boilers.

Riverside Boiler Works, Cambridge, Mass.
Riverside Range Boilers and Tanks. Catalog. 6 x 3 in. 35 pp. Illustrated. Shows sizes regularly manufactured, methods of installation and descriptions of processes used in manufacturing.

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

United States Radiator Corporation, Detroit, Mich.
The Complete Line. Catalog. 4¼ x 7¼ in. 255 pp. Illustrated. Contains important technical information of special interest to architects and heating engineers.
A Day's Work. Booklet. 3½ x 6 in. 20 pp. Suggestions from employees for the purpose of promoting service and good will.

Utica Heating Co., Utica, N. Y.
Imperial Boilers & Heating Supplies. Catalog. 3½ x 6½ in. 52 pp. Illustrated.
Imperial Super Smokeless Boilers. Loose leaf catalog. 8½ x 11 in. 24 pp.
Superior Warm Air Furnaces. Catalog. 4½ x 8 in. 36 pp. Illustrated.
New Idea Pipeless Furnaces. Circular. 8½ x 11 in. 4 pp. Illustrated.

HOISTS

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

HOLLOW TILE—See Tile, Hollow

INSULATION

Armstrong Cork Co., 132 Twenty-fourth Street, Pittsburgh, Pa.
Nonpareil Corkboard Insulation. Catalog. 6 x 9 in. 152 pp. Illustrated. Describes use in cold storage warehouses and wherever constant low temperatures are necessary.
Nonpareil Cork Covering. Catalog. 6 x 9 in. 64 pp. Illustrated. Describes the insulation of cold pipes and tanks of all kinds.

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

JOISTS AND STUDS, PRESSED STEEL

General Fireproofing Co., Youngstown, Ohio.
Steel Lumber. Hand Book. 4 x 6½ in. 72 pp. Illustrated. Data on the use of Steel Lumber and Metal Lath for economical fireproof construction. Tables and Specifications.

Truscon Steel Co., Youngstown, Ohio.
Truscon Standard Buildings, 4th ed. Catalog. 8½ x 11 in. 40 pp. Illustrated. Erection details, cross-section diagrams and adaptations are given.
Truscon Structural Pressed Steel. Catalog. 8½ x 11 in. 24 pp. Illustrated. Information on Pressed Steel Beams and Joists for light occupancy buildings. Tables, specifications and views of installations.

SELECTED LIST OF MANUFACTURERS' PUBLICATIONS — *Continued from page 52*

KITCHEN EQUIPMENT

Aluminum Cooking Utensils Co., New Kensington, Pa.
Wear-Ever. Catalog. 6 x 9 in. 55 pp. Illustrated.

LATH, METAL AND REINFORCING

The Bostwick Steel Lath Co., Niles, Ohio.
Bostwick Steel Lath, Revised Edition 1920. Catalog. 9 x 11½ in. 28 pp. Illustrated. Covers the entire line. Drawings and Specifications.

General Fireproofing Co., Youngstown, Ohio.
Herringbone Rigid Metal Lath. Catalog. 8½ x 11 in. 32 pp. Illustrated. A treatise on the many uses of Metal Lath.
Trussit. Booklet. 6 x 9 in. 16 pp. Illustrated. Detailed descriptions on the use of Trussit as a reinforcement for Concrete.
Self-Sentering—A Reinforcement for Concrete Floors, Roofs and Walls. Booklet. 8½ x 11 in. 36 pp. Illustrated.

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

Truscon Steel Co., Youngstown, Ohio.
High Rib and Metal Lath. 18th ed. Catalog. 8½ x 11 in. 64 pp. Illustrated. Gives properties of laths, specifications, special uses and views of installations.

LUMBER

American Walnut Mfrs. Assoc., Rm. 1000, 616 S. Michigan Blvd., Chicago, Ill.
American Walnut, the Choice of the Master Craftsman. Booklet. 7 x 9 in. 45 pp. Illustrated. The use of walnut in fine furniture and woodwork.
Specification Notes for American Walnut Interior Trim. 8½ x 11 in. 3 pp. Includes notes on the different styles of finish suitable for walnut.

California Redwood Association, 760 Exposition Building, San Francisco, Calif.
California Redwood Homes. Booklet. 6 x 9 in. 16 pp. Illustrated.
Specialty Uses of California Redwood. Booklet. 6 x 9 in. 24 pp. Illustrated.
California Redwood on the Farm. Booklet. 3¾ x 9¼ in. 40 pp. Illustrated.
How to Finish California Redwood. Booklet. 3¾ x 9¼ in. 16 pp. Illustrated. Formulae and instructions.

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

METAL LATH—See Lath, Metal and Reinforcing

METALS

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

International Nickel Company, 43 Exchange Place, New York, N. Y.
Pamphlet. 3½ x 6 in. 8 pp. Illustrated. Describing the wire strength and durability of Monel Screens.

METAL TRIM — See Doors, Windows and Trim, Metal

MORTAR COLORS

Clinton Metallic Paint Co., Clinton, N. Y.
Clinton Mortar Colors. Booklet. 3½ x 6½ in. 8 pp. Illustrated. Complete description of Clinton Mortar Colors with color samples.

NURSERIES

King Construction Company, N. Tonawanda, N. Y.
Catalog No. 52. 9 x 11 in. 45 pp. Illustrated. Illustrating and describing greenhouses erected for private estates and public parks.

OFFICE SUPPLIES

Angel, Inc., H. Reeve, 7-11 Spruce St., New York.
Drawing Papers. Sample Book. 3½ x 5½ in. Showing all the surfaces and substances in general demand.

Dixon Crucible Co., Joseph, Pencil Dept., 224 J. Jersey City, N.J.
Finding Your Pencil. Booklet. 6½ x 3½ in. 16 pp. Illustrated.
The First Five. Booklet. 3½ x 5½ in. 10 pp. Illustrated.
A Study in Sepia. Booklet. 7 x 4½ in. 5 pp. Illustrated.

Faber Co., Eberhard, 37 Greenpoint Avenue, Brooklyn, N. Y.
Eberhard Faber Pencils, How They Are Made. Booklet. 4¾ x 6¾ in. 23 pp. Illustrated.

N. Y. Blueprint Paper Co., 102 Reade St., New York.
Catalog of Drawing Materials, Mathematical and Engineering Instruments. 4 x 6 in. 400 pp. Illustrated. Covers the complete line.

PAINTS, STAINS, VARNISHES AND WOOD FINISHES

Berry Brothers, Detroit, Michigan.
"Natural Woods and How to Finish Them." Booklet. 6½ x 4¾ in. 95 pp. Containing technical information and advice concerning wood finishing.
"Beautiful Homes." Booklet. 8½ x 6½ in. 26 pp. Illustrated in colors. Giving information to home builders and others on interior finishing.

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

Creo-Dipt Company, Inc., 1025 Oliver St., Tonawanda, N. Y.
Dixie White. Folder. 3½ x 8 in. 3 pp. Illustrated. A heavy white stain which produces the whitewashed effect.

Devoe & Raynolds Co., Inc., 101 Fulton Street, New York.
Architectural Finishes. Catalog. 5 x 7 in. 40 pp. Specifications and suggestions for painting, varnishing, staining and enameling.
Harmony in the Home. Booklet. 4½ x 6 in. 24 pp. Illustrated. Flat finish wall paints, color suggestions and specifications.

Eagle-Picher Lead Co., The, 208 S. La Salle Street, Chicago, Ill.
Protective Coatings for Structural Metals. Book. 6 x 9 in. 48 pp. Illustrated.

Fox Co., M. Ewing, New York, N. Y.
Calcimines. Booklet. 3½ x 6¼ in. 8 pp. Color cards.

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

The Sherwin-Williams Co., 882 Canal Road, Cleveland, Ohio.
A Book of Painting and Varnishing Specifications. 8½ x 11 in. 30 pp. A text book on painting and finishing.
Announcement of Sherwin-Williams Flat-Tone Multi-Color Effects. Booklet. 2½ x 6 in. 10 pp. Illustrated. Development of a new system of wall decoration.
Monthly Architectural Bulletin. 8½ x 11 in. Bulletin issued periodically on painting and finishing.

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

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

Truscon Laboratories, The, Cor. Caniff Avenue and Grand Trunk R. R., Detroit, Mich.
Spread the Sunshine Inside. Booklet. 5 x 8 in. 24 pp. Describes methods for light saving by the application of light reflecting enamels to interior walls of factories and workrooms.

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

PIPE

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

National Tube Co., Frick Building, Pittsburgh, Pa.
National Bulletin No. 11, History, Characteristics and Advantages of National Pipe. Catalog. 8½ x 11 in. 48 pp. Illustrated.
National Bulletin No. 25. National Pipe in Large Buildings. Catalog. 8½ x 11 in. 88 pp. Illustrated.
National Bulletin No. 7, Manufacture and Advantages of National Welding Scale Free Pipe. Booklet. 8½ x 11 in. 16 pp. Illustrated.
National Bulletin No. 3, Prevention of Corrosion in Pipe. Booklet. 8½ x 11 in. 24 pp. Illustrated. Contains the results of carefully conducted investigations.

PLUMBING EQUIPMENT

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

Clow & Sons, James B., 534 S. Franklin Street, Chicago, Ill.
Catalog "M." 9½ x 12 in. 184 pp. Illustrated. Shows complete line of plumbing fixtures for Schools, Railroads and Industrial Plants.

Crane Company, 836 S. Michigan Avenue, Chicago, Ill.
Crane Products in World Wide Use. Catalog. 5 x 9½ in. 24 pp. Illustrated.
Plumbing Suggestions for Home Builders. Catalog. 3 x 6 in. 80 pp. Illustrated.
Plumbing Suggestions for Industrial Plants. Catalog. 4 x 6½ in. 43 pp. Illustrated.
No. 50 Steam Pocket Catalog. 4 x 6½ in. 775 pp. Illustrated. Describes the complete line of the Crane Co.

Eagle-Picher Lead Co., The, 208 S. La Salle Street, Chicago, Ill.
Plumbers' Lead Guide. Catalog. 4⅛ x 7⅝ in. 52 pp. Illustrated.

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

Rundle-Spence Mfg. Co., Milwaukee, Wis.
Bubbling Fountains. Catalog. 5½ x 8 in. 74 pp. Illustrated.

PUMPS

Goulds Mfg. Co., The, Seneca Falls, N. Y.
Set of Twenty Bulletins. 7½ x 10½ in. 12 to 32 pp. each. Illustrated. Covers complete line of power and centrifugal pumps for all services.
Catalog "K." 6 x 9 in. 216 pp. Illustrated. Covers complete line of smaller size pumps.

SELECTED LIST OF MANUFACTURERS' PUBLICATIONS—*Continued from page 54*

REFRIGERATION

Johns-Manville Co., The H. W., Madison Avenue and 41st Street, New York, N. Y.
Johns-Manville System of Refrigeration. Booklet. 3½ x 6 in. 16 pp. Illustrated.

ROOFING

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

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

Keasbey & Mattison Co., Ambler, Pa.
Ambler Asbestos Shingles. Catalog. 5½ x 8½ in. 40 pp. Illustrated.
Ambler Asbestos Corrugated Roofing and Siding. Catalog. 8½ x 11 in. 36 pp. Illustrated. Standard Purlin Spacing Tables.
Ambler Asbestos Corrugated Roofing and Siding. Catalog. 8½ x 11 in. 20 pp. Illustrated. Prices and specifications.
Ambler Asbestos Building Lumber. Catalog. 8½ x 11 in. 32 pp. Illustrated.

SEWAGE DISPOSAL

Kewanee Private Utilities, 442 Franklin St., Kewanee, Ill.
Specification Sheets. 7¾ x 10¾ in. 46 pp. Illustrated. Detailed drawings and specifications covering water supply and sewage disposal systems.

SHRUBS, TREES, ETC.—See Nurseries

STONE, BUILDING

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

Indiana Limestone Quarrymen's Association, Box 766, Bedford, Indiana.
Vol. 1. Indiana Limestone Library. 6 x 9 in. 36 pp. Illustrated. Giving general information regarding Indiana Limestone, its physical characteristics, etc.
Vol. 4. Indiana Limestone Bank Book. 6 x 9 in. 48 pp. Illustrated. Descriptive of the use of Indiana Limestone for bank buildings, containing partial list of buildings in which it has been used.
Vol. 27. Designs for Houses of Indiana Limestone. 8½ x 11 in, 32 pp. Illustrated. Being the best designs submitted in competition for a detached residence faced with Indiana Limestone conducted by *The Architectural Review.*

National Building Granite Quarries Association, Inc. 31 State Street, Boston, Mass.
Booklet. 8½ x 11 in. 16 pp. Illustrated. Contains nineteen color plates of standard American Building Granites; specifications; classification listing colors, textures, and producers; detail sheets illustrating relative value of mouldings, economical design and typical construction; a general description of granite including uses, finishes, tests, etc.

STORE FRONTS

Kawneer Co., The, Niles, Mich.
Kawneer Solid Copper Store Fronts. Catalog "K." 8½ x 11 in. 32 pp. Illustrated. Information about various members used in the pioneer Kawneer construction.
A Collection of Successful Designs. Catalog. 9¼ x 6¼ in. 64 pp. Illustrated. Showing by use of drawings and photographs many types of Kawneer Solid Copper Store Fronts.

Zouri Drawn Metal Co., B. J. 10, Chicago Heights, Ill.
Key to Getting the People In. Catalog BJ8. 6 x 9 in. 68 pp. Illustrated. Zouri Safety Sash, corner and division bars have been approved by the Underwriter's Laboratories and are manufactured under their supervision.

STUCCO—See Cement, Portland.

STUCCO AND WALL BOARD

Bishopric Manufacturing Co., 103 Este Avenue, Cincinnati, Ohio.
Homes Built on the Wisdom of Ages. Catalog. 6 x 9 in. 48 pp. Illustrated. Describing the use of Bishopric stucco board and Bishopric sheathing board.

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

TELEPHONE, INTER-COMMUNICATING

Western Electric Co., 195 Broadway, New York.
Specification for W. E. Inter-phones and Private Telephone Systems. 8 x 10¾ in. 88 pp. Illustrated.

TERRA COTTA

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

TILE, FLOOR AND WALL

Associated Tile Manufacturers, The, Beaver Falls, Pa.
Tile Floors and Walls for Hospitals. Booklet. 8½ x 11 in. 40 pp. Illustrated. Reasons for selecting Tile for hospitals.
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Swimming Pools. Booklet. 8½ x 11 in. 32 pp. Illustrated. A handbook on swimming pools and their construction.

TILE, HOLLOW

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

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

VALVES

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

VENTILATION

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

Royal Ventilator Co., 415 Locust Street, Philadelphia, Pa.
Ventilation. Catalog. 4¾ x 9 in. 48 pp. Illustrated.

WATERPROOFING

Anti-Hydro Waterproofing Co., 299 Broadway, N. Y.
Waterproofing. Booklet. 3½ x 6 in. 4 pp. Methods used for waterproofing concrete and mortars.

General Fireproofing Company, Youngstown, Ohio.
The Waterproofing Handbook. 6 x 9 in. 95 pp. Illustrated. A Guide to the correct use of GF Waterproofing in addition to describing the complete line of materials.

Minwax Company, Inc., 18 East 41st Street, New York, N. Y.
Waterproofing Exposed Walls. Bulletin No. 22. 8½ x 10 in. 12 pp. Illustrated. Descriptions and specifications dealing with two methods of dampproofing above grade walls, viz., Minwax clear waterproofing or Minwax brick and cement coating, and Minwax asphaltic dampproofing No. 300.
Products Bulletin. 8½ x 5½ in. 24 pp. Illustrated with drawings. Condensed catalog of Minwax products for standardized structural protection.

Sandusky Cement Co., Dept. F, Cleveland, Ohio.
Medusa Waterproofing. Booklet. 6¾ x 9 in. 37 pp. Illustrated.

Toch Brothers, 320 Fifth Ave., New York, N. Y.
Toxement. Booklet. 5¼ x 8⅛ in. Illustrated. 24 pp. Describes Toxement, an integral waterproofing compound for concrete, stucco, cement, mortar, etc.

Truscon Laboratories, The, Cor. Caniff Avenue and Grand Trunk R. R. Detroit, Mich.
Structural Waterproofing. Handbook. 8½ x 11 in. 100 pp. Illustrated. A reliable and trustworthy text-book on modern waterproofing practice.

WATER SOFTENERS

Graver Corp., East Chicago, Ind.
Graver Zeolite Softeners. Bulletin 509. 8½ x 11 in. 16 pp. Illustrated. Water softeners for homes, institutions, hotels, apartments, etc.
Graver Small Continuous Water Softener. Bulletin 507. 8½ x 11 in. 12 pp. Illustrated. A softener for raw water ice plants and small steam power plants.

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

WATER SYSTEMS

Graver Corporation, East Chicago, Ind.
Graver Vertical Pressure Water Feeders. Bulletin 502. 8½ x 11 in. 8 pp. Illustrated. Detailed description of parts, capacities and dimensions.

WINDOW CORD

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

WINDOWS, CASEMENT

Crittall Casement Window Co., 685 East Atwater Street, Detroit, Mich.
Catalog No. 18. 9 x 12 in. 56 pp. Illustrated.

Hoffman Mfg. Co., Andrew, 900 Steger Building, Chicago, Ill.
Hoffman Casements. Catalog. 5½ x 8 in. 8 pp. Illustrated. Miniature details and phantom drawings.
F. S. Details. 22 x 34 in. Full size working details for mill work and installation with isometric views.
Architects' Portfolio. 8½ x 11 in. Loose leaf circulars.

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

International Casement Co., Inc., Jamestown, N. Y.
Casements for Banks and Public Buildings. Catalog. 8½ x 11 in. 24 pp. Illustrated. Shows construction of steel windows and surrounding masonry.

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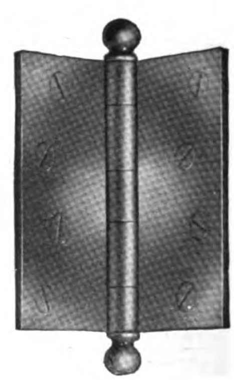

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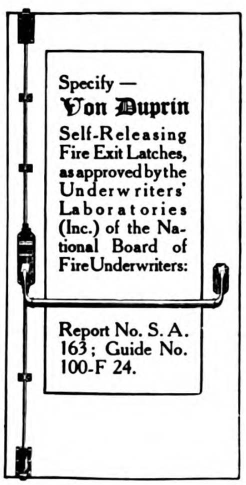
On Theatres



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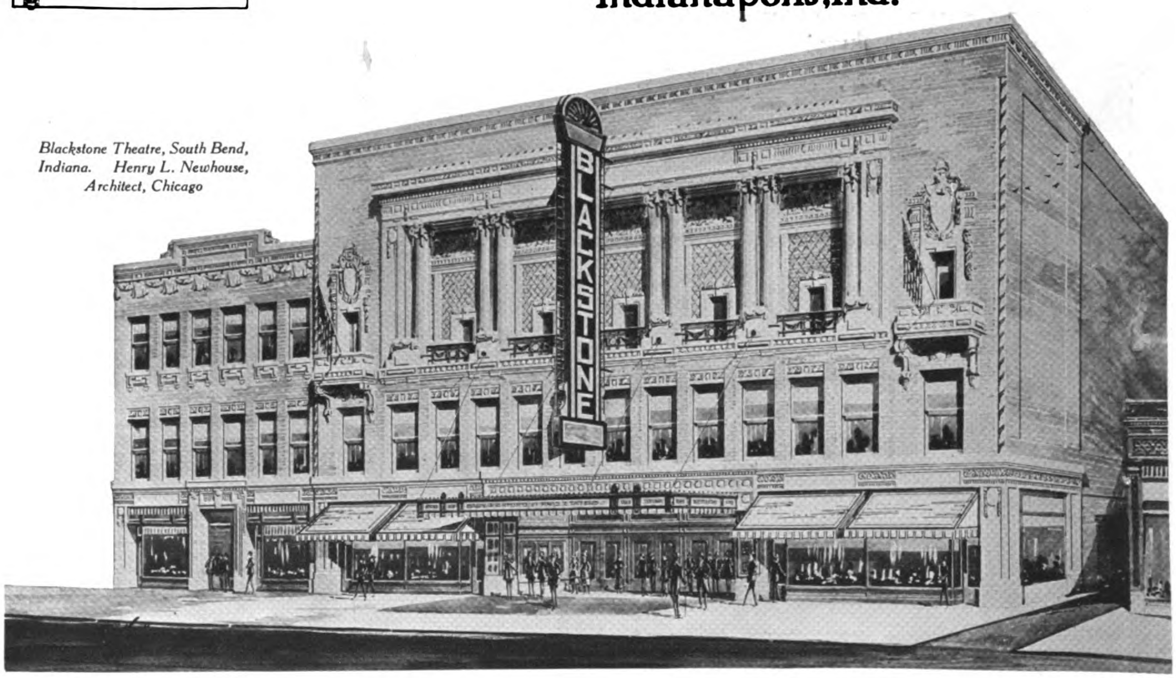
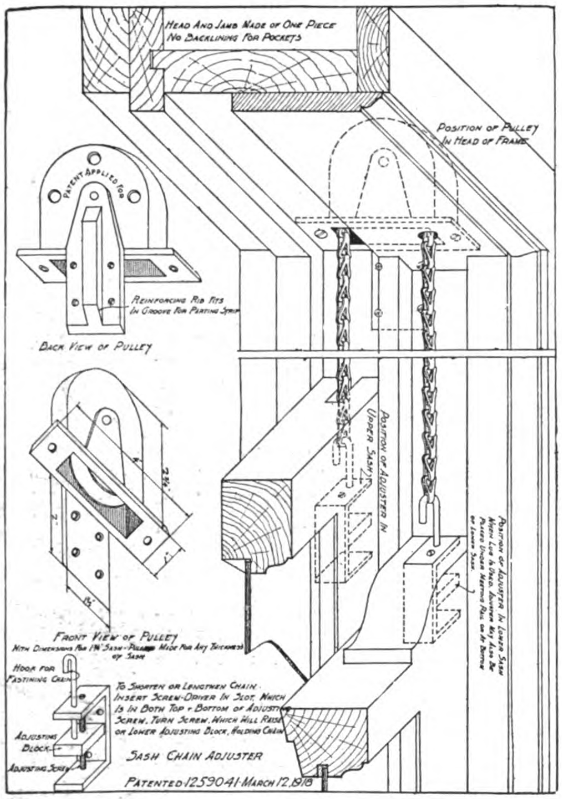


Blackstone Theatre, South Bend, Indiana. Henry L. Newhouse, Architect, Chicago



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Spot Cord is made of extra quality stock, is carefully inspected and is guaranteed free from the imperfections of braid and finish which make common sash cord wear out so quickly.

It can be distinguished at a glance by our trade mark, the Colored Spots, used only with this quality.

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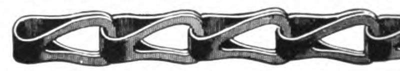

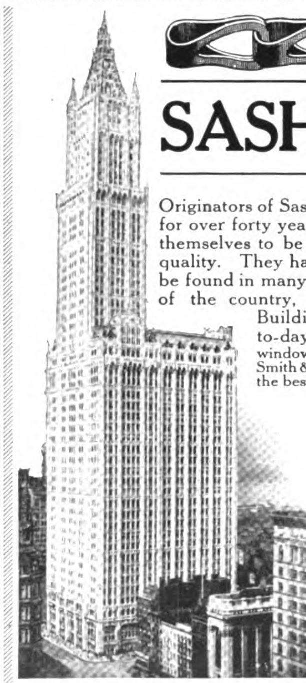

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Woolworth Bldg., New York, See Page 943, Sweet's Catalog

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Just so, two Construction Companies, working from the same specifications, can produce widely different results as measured in the satisfaction of the owner and the architect.

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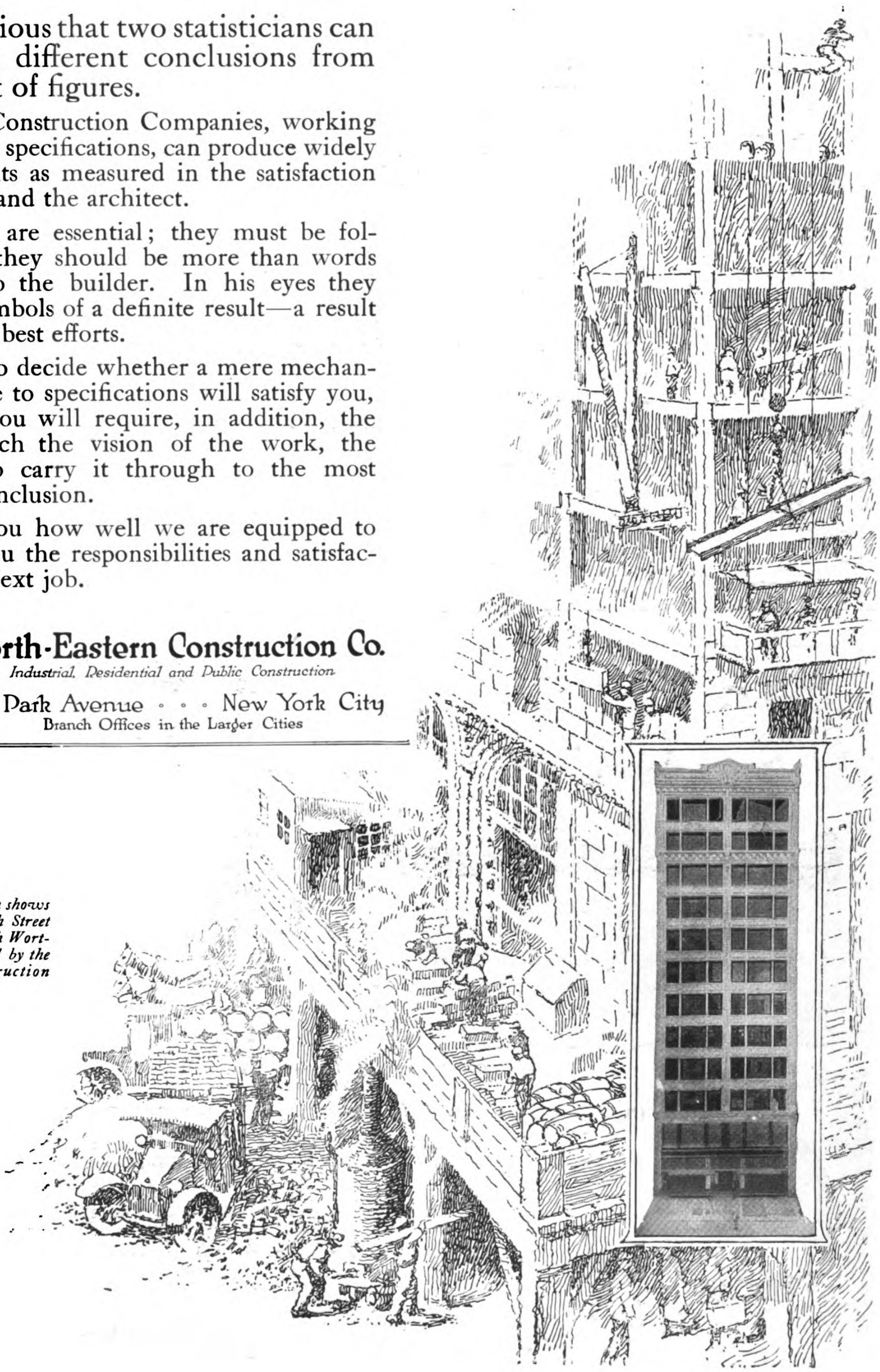

Photographic illustration shows an office building at 36th Street New York City. Dietrich Wortman, Architect. Erected by the North-Eastern Construction Company.

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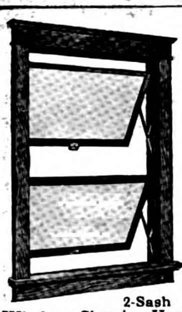

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For Office Buildings, Apartments, Hotels, Hospitals, Schools and Homes

Fixtures Attached to Side Jamb without Sash Showing Track and Operating Arms

Operate Entirely Outward from Central Position in Frame—1 to 100 per cent Ventilation,—No Direct Draft—Perfect Weathering, Rugged Strength — Save 50 per cent on Up-Keep as Both Sides of Sash can be Cleaned from Within — Conveniently Screened — Do not Interfere with Shades or Curtains.

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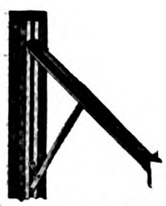
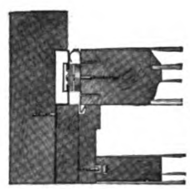


Same as above with Sash and Stop in Place



Sectional View at Side Jamb showing Track & Weathering

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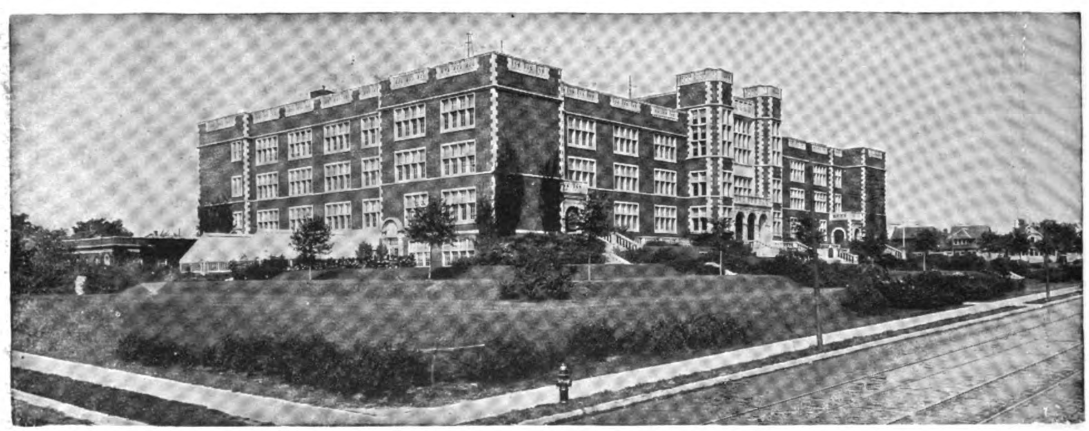

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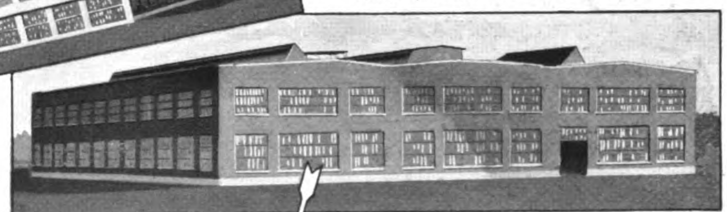

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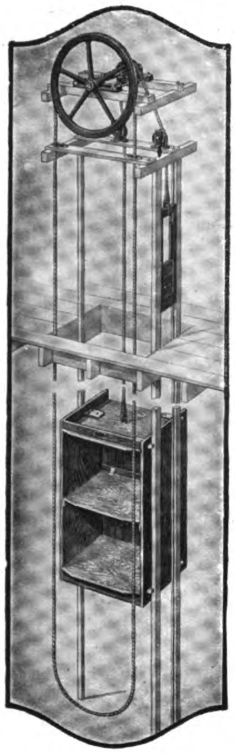

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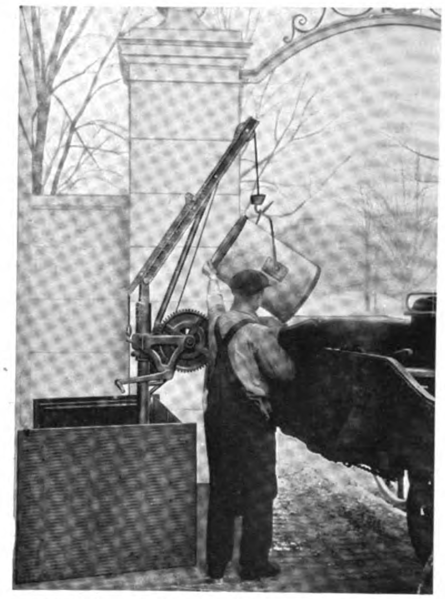

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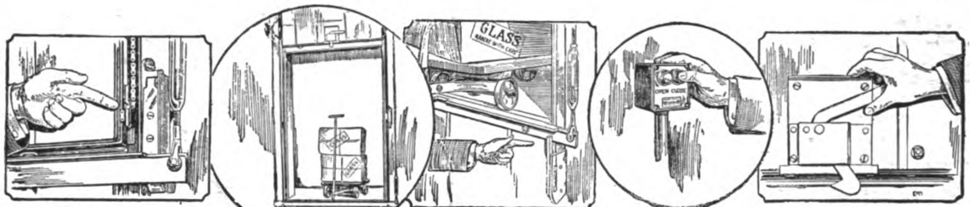

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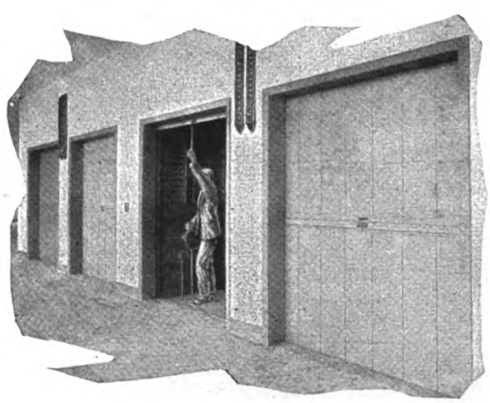

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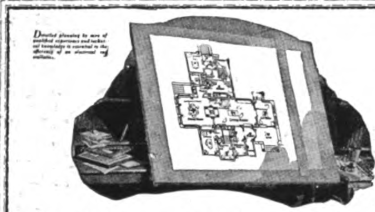

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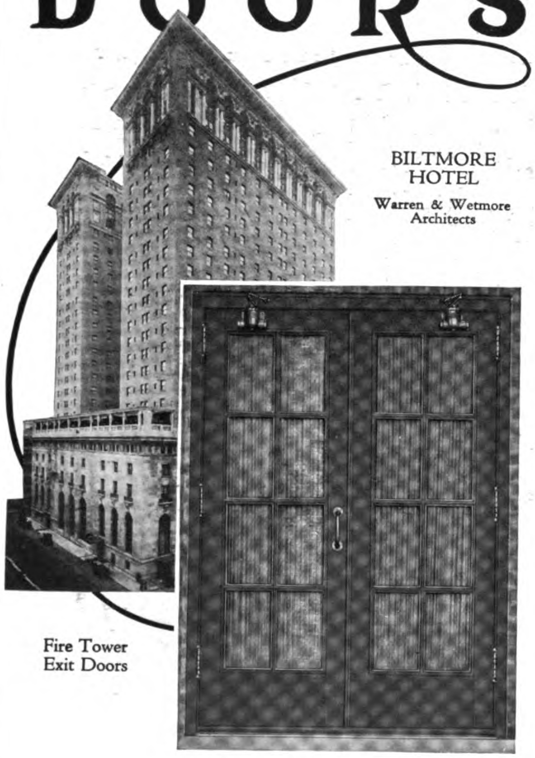

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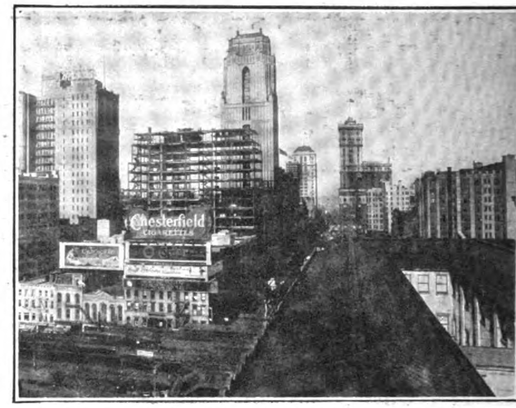

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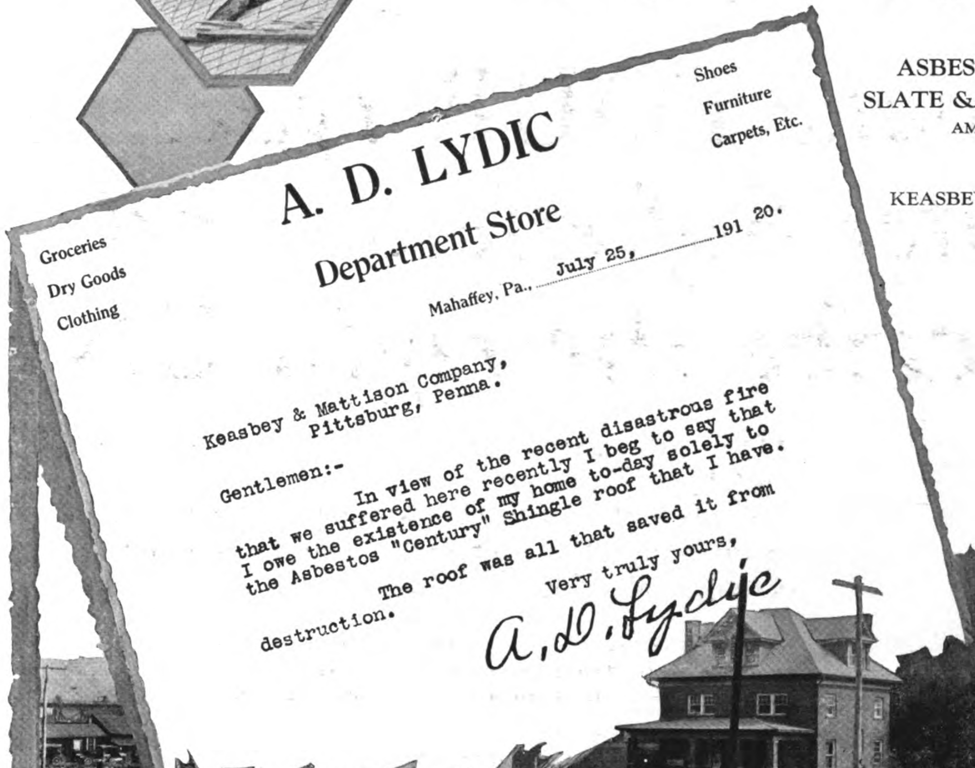

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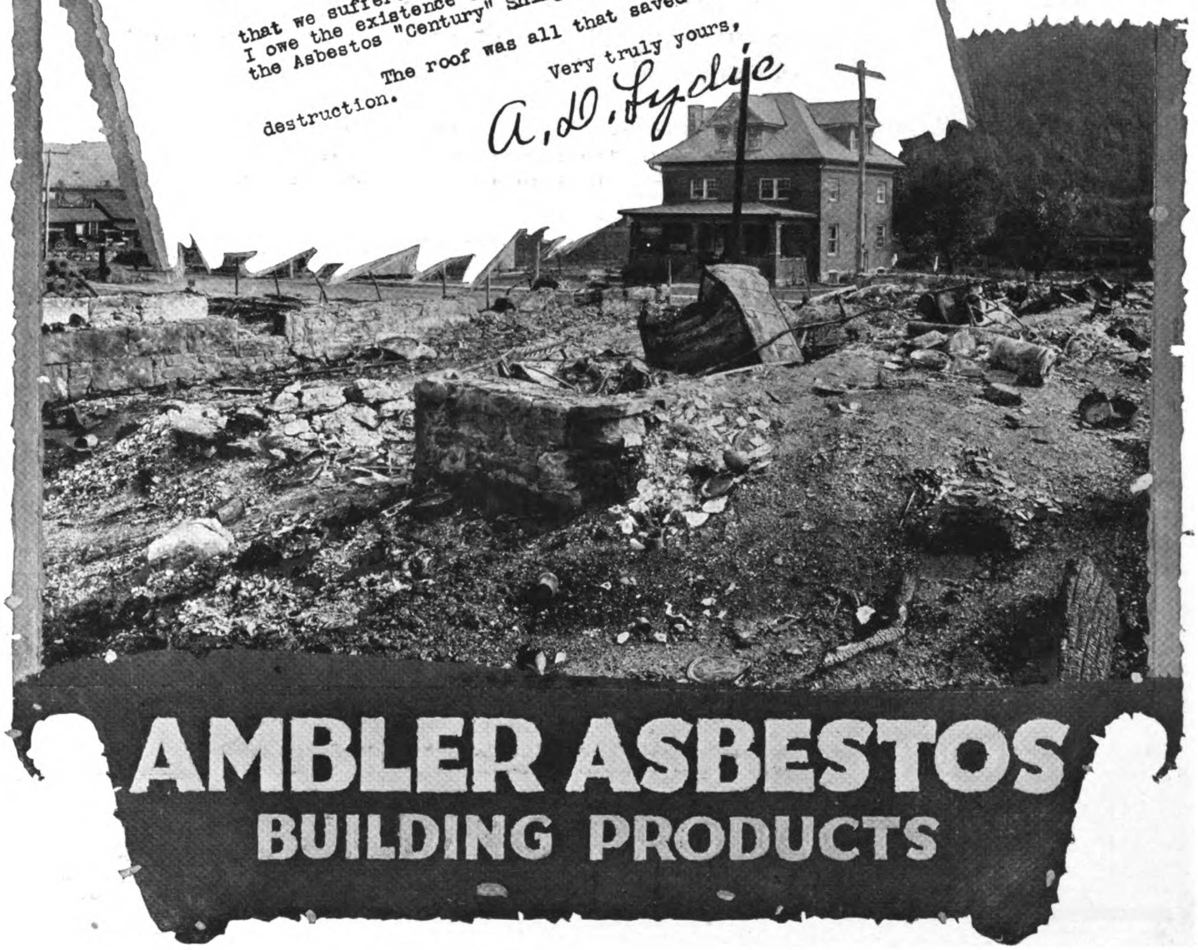
Illustration shows Mr. Lydic's house after fire referred to in letter



Friends Church
Whittier, Cal.

Roofed with Carey
Asfaltslate Shingles

Carey ASFALTSLATE SHINGLES

Lie Flat and Stay Flat Under Severest Conditions

THERE is one sure way to tell a Carey Shingle; it stays flat.

Placing two shingles side by side, they may look exactly alike, they may be finished with the same kind of slate and yet one may wear much better than the other when it is actually on the roof.

Carey Asfaltslate Shingles applied in Southern California or in Florida maintain the record—they do *not* curl and the shingles which will not curl in these hot dry climates will stay flat any place.

Any Carey distributor can point out churches, schools, fine residences and all sorts of steep roof buildings roofed with Carey shingles which have been giving service for years.

It doesn't pay to take chances with a shingle and that is why so many architects insist on Carey Asfaltslate Shingles.

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504-524 Wayne Avenue, Lockland, Cincinnati, Ohio

Branches in fifty leading cities

Headquarters for the building and insulating products of

ASPHALT ASBESTOS MAGNESIA

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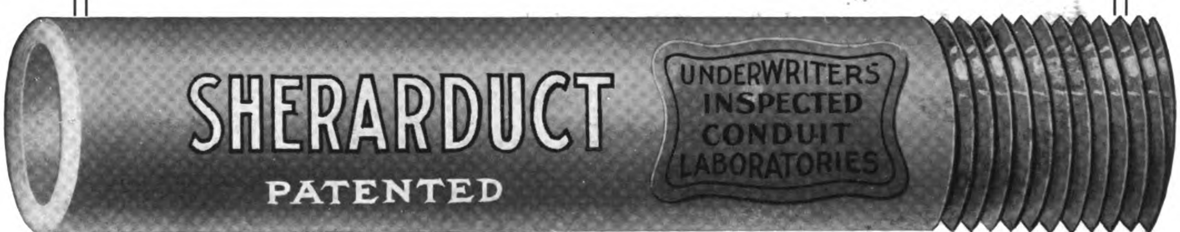
Rigid Steel Conduit

WHERE electrical conduit of the highest quality is required, architects invariably specify "SHERARDUCT." It is the only conduit that is rust-proof and acid-proof both inside and outside. It is used exclusively in a majority of the country's finest buildings.



National Metal Molding Co.

General Offices: **Fulton Bldg., Pittsburgh, Pa.**

ATLANTA	DENVER	NEW YORK	SALT LAKE CITY
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Canadian Distributors, Canadian General Electric Co., Limited

Our nearest representative or distributor will be glad to work with you when planning electrical installations

NATIONAL PRODUCTS
N M M Co

IT ALWAYS DOES!

Inferior drainage material means health menacing polluted cellars, escaping sewer gas and costly replacement in a few years

PHONE, 296 MANSFIELD

To VERNON R. LEERHSEN, Jr.

SUCCESSOR TO CHARLES MERZ

Sanitary Plumber, Steam and Gas Fitter

Jobbing Promptly Attended To

1622 NEWKIRK AVENUE Near East 17th Street

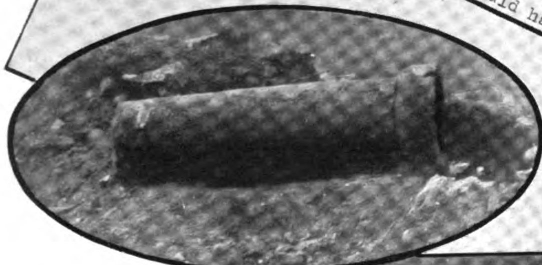
Brooklyn, N. Y. October 22nd 1920

M National Foundry Co., of N.Y., Inc
10-40 Sandford Street, Brooklyn, N.Y.

The accompaning photographs show a length of Clay Pipe, with Tree Roots protruding, was one of several that I took out of a sewer at the residence of Mr. William Slocum, 690 E.17th Street, Flatbush, residential section of Brooklyn, N.Y.

This is only one instance of a great many where Clay Sewers have been stopped up by Tree Roots in this section and simply goes to show that Clay Pipe is a failure for sewers where Cast Iron Pipe would have avoided this trouble

R Leerhsen



Part of soil-pipe and fittings good as new after 35 years service

The inferior pipe shown above was replaced by

CAST IRON SOIL PIPE

the only pipe providing building drainage that

OUTLASTS THE BUILDING—ANY BUILDING

E—103

Specifications and illustrated literature will be mailed upon request by any or all of the following independent and competing makers of Cast Iron Soil Pipe and Fittings

The Central Foundry Co., ... 90 West St., N. Y. C.
Haines, Jones & Cadbury Co., ... 1130 Ridge Ave., Phila., Pa.
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Krupp Foundry Co., ... Lansdale, Pa.
National Fdy. Co. of N. Y., Inc., 10 Sanford St., Brooklyn, N. Y.
Salem Brass & Iron Mfg. Co., ... Bridgeton, N. J.
Sanitary Co. of America, ... Linfield, Pa
Somerville Iron Works, ... Somerville, N. J
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IN THE BUILDING UNDER THE GROUND

THE PIPE EVER-LASTING

ITS HISTORY IS ITS ADVOCATE

REPUTATIONS

AN architect's reputation is his greatest asset; it is acquired only through merit, and he overlooks nothing that will help him to maintain it.

The manufacturer, too, has a reputation to maintain, and in his case it is dependent not only upon fulfilling certain architectural and engineering requirements, but upon satisfying architect and client as to quality in the product even before it is installed.

The large number of modern buildings equipped with "NATIONAL" Pipe form the most convincing evidence of the quality of this product.

The reputation which "NATIONAL" Pipe has made in the pipe consuming trade generally, and among architects in particular, is the result of merit — the embodiment of that quality which maintains the reputations of both architect and manufacturer.

Have you a copy of "NATIONAL" Bulletin No. 25—
" 'NATIONAL' Pipe in Large Buildings"?

NATIONAL TUBE COMPANY

PITTSBURGH, PA.

District Sales Offices in The Larger Cities

LOOK FOR
NATIONAL
THE NAME

The Hotel Drake, Chicago: Marshall & Fox, Architects; Crane Co., Jobbers; O'Callahan Bros., Plumbers

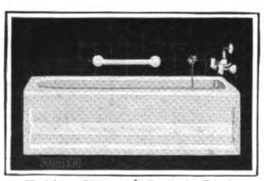
KOHLER

And THE HOTEL DRAKE

Chicago's newest hotel—the Drake—situated on the famous Lake Shore Drive, in the heart of the fashionable district—surrounds the public which gives it patronage with not merely the most modern furnishings and fittings, but the most luxurious, as well. And here, as in so many other hostelries of the first class, are found the famous Kohler Enameled "Viceroy" Built-in Baths, in the 673 bathrooms. Costing no more than less beautiful, less durable fixtures, these tubs reflect the utmost good taste, in hotel, club, public institution, home or apartment. And their use is steadily growing.

* * * *

If your file lacks that convenient handbook, "KOHLER of KOHLER," illustrating and describing in detail the Kohler Enameled Plumbing Ware Products, kindly write



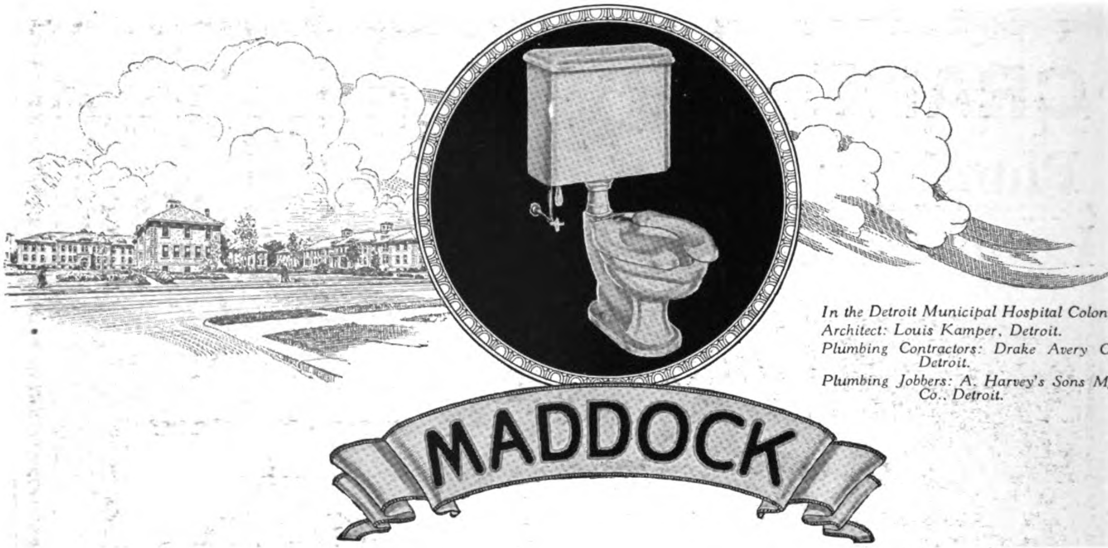
Kohler "Viceroy" Built-in Bath
Recess Pattern

KOHLER OF KOHLER

Kohler Co., *Founded 1873,* Kohler, Wis.
Shipping Point, Sheboygan, Wis.

BRANCHES IN PRINCIPAL CITIES

MANUFACTURERS OF ENAMELED PLUMBING WARE AND KOHLER AUTOMATIC POWER AND LIGHT 110 VOLT D. C.



In the Detroit Municipal Hospital Colony.
Architect: Louis Kamper, Detroit.
Plumbing Contractors: Drake Avery Co., Detroit.
Plumbing Jobbers: A. Harvey's Sons Mfg. Co., Detroit.

The advantage of "all white" in plumbing equipment

The Detroit Municipal Hospital Colony, where the requirements of sanitation and the utility of the appointment are most exacting, is equipped with Maddock plumbing fixtures.

Made entirely of glistening, pure white vitreous china which will not chip, craze, stain or discolor, Maddock fixtures always are easy to clean and they retain their original whiteness throughout years and years of use.

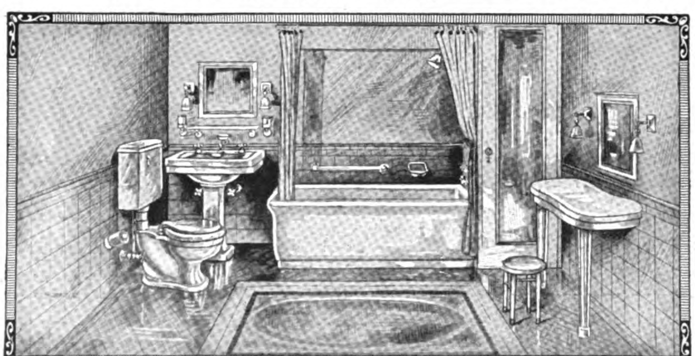
Fixtures of this character reduce the labor of cleaning, they provide better protection against disease and, wherever installed, they are always a source of pride.

Architects who do not have Maddock literature on file should write for our architect's catalog which will be mailed promptly upon request.

See our section in the Fourteenth Annual Edition of Sweet's Catalog, pages 1037 to 1044.

Thomas Maddock's Sons Company, Trenton, N. J.
OLDEST • SANITARY • POTTERS • IN • AMERICA —— ESTABLISHED 1859
Manufacturers of sanitary earthenware plumbing fixtures for bath, kitchen and laundry needs in the home; also sanitary ware for medical, industrial, commercial and public building installations
Branches: New York – Philadelphia – Chicago – San Francisco – St. Louis

THOS. MADDOCK'S SONS CO. TRENTON, N.J.



The fixture shown in the panel is the Ariston — a vitreous china, silent-action, non-soiling, syphon jet closet. This pattern has the largest water surface of any closet made today. It has an extended lip, front and back. These features, together with the thin, sanitary flushing rim and other Maddock advantages, provide a greater degree of non-soiling insurance and better sanitation than that attained in any other closet construction.

M First in the industry — foremost since M

A Few Types of Herringbone Buildings

Municipal Library, San Francisco, Cal.

Bender Hotel, Houston, Texas

Beautiful Residence at Palm Beach, Fla.

Jane Arcade Building, St. Louis, Mo.

MANIFESTS SUPERIORITY

ONLY through continual usage has *Herringbone Rigid Metal Lath* proven its superiority. It did not gain prestige over night. Metal Lath as a base for stucco and plaster was something new. In time its value became known and it was more extensively used. By many remarkable successes, both as a base for exterior stucco work and interior plastering, *Herringbone* has gained its present position.

For substantial buildings and for beautiful homes and most of all, for buildings that are to be fireproof, *specify Herringbone Rigid Metal Lath.* It lasts without depreciation.

The General Fireproofing Co.

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HIGH REPUTATION is never the result of chance. Underneath it you will always find the rock-hewn foundation of real worth. The products of this Company have won lasting favor by reason of their strict adherence to highest quality standards.

Apollo

BEST BLOOM GALVANIZED SHEETS
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We manufacture Sheets and Plates for every known purpose. These products are sold by leading metal merchants. Write nearest District Sales Office for full information. Shall we send Booklet and Weight Cards — valuable in every architect's office?

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General Offices: Frick Building, Pittsburgh, Pa.

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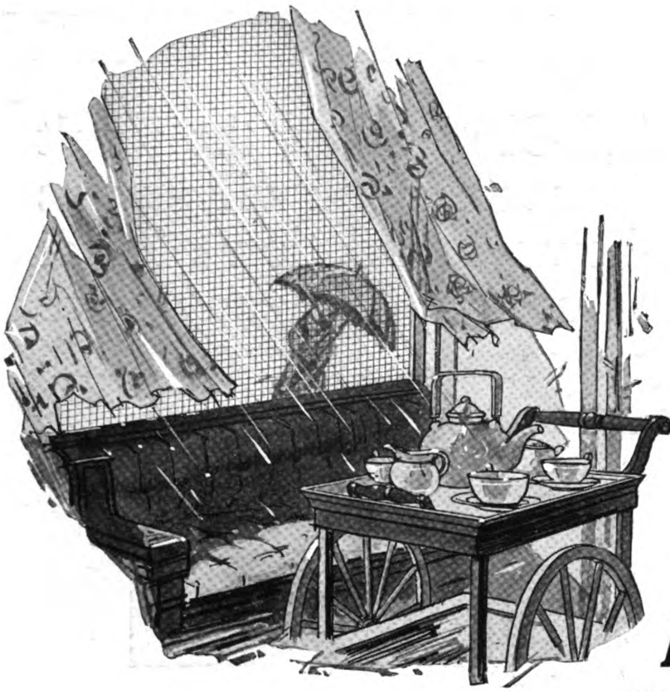


Rain Carries No Rust from Monel Screening

THIS in itself is proof of Monel metal's resistance to rust or corrosion.

For rain or fog almost always holds sea salt, smoke, acids or chemicals that quickly start rusting action on iron, copper—even bronze screening.

Industrial use has proven Monel metal immune to the pitting, eating action of active chemical solutions that quickly destroy iron, copper, bronze and other commercial metals.

You can specify Monel metal wire screening, secure in the knowledge that its service life will be at least twice that of the more commonly used screening metals. A strand of Monel wire is 60% stronger than the same size

INCO

MOnel metal

THE INTERNATIONAL NICKEL COMPANY

strand of copper wire. This means not only that Monel screen will stand more abuse but that greater visibility can be had in the finer meshes.

Monel screening will cost about one third more than bronze on the per square foot basis, but Monel screens will last more than twice as long. And when you consider that labor costs are the biggest item in screen construction and renewals, the obvious economy of Monel is even more explicitly emphasized.

Monel screen is made in the following widths, meshes and gauges:

Widths, 18 by 2 inch increase up to 48 inches.
Meshes, 14, 16, 18.
Gauges, .009 for 18 mesh.
.010 for 14 and 16 meshes.

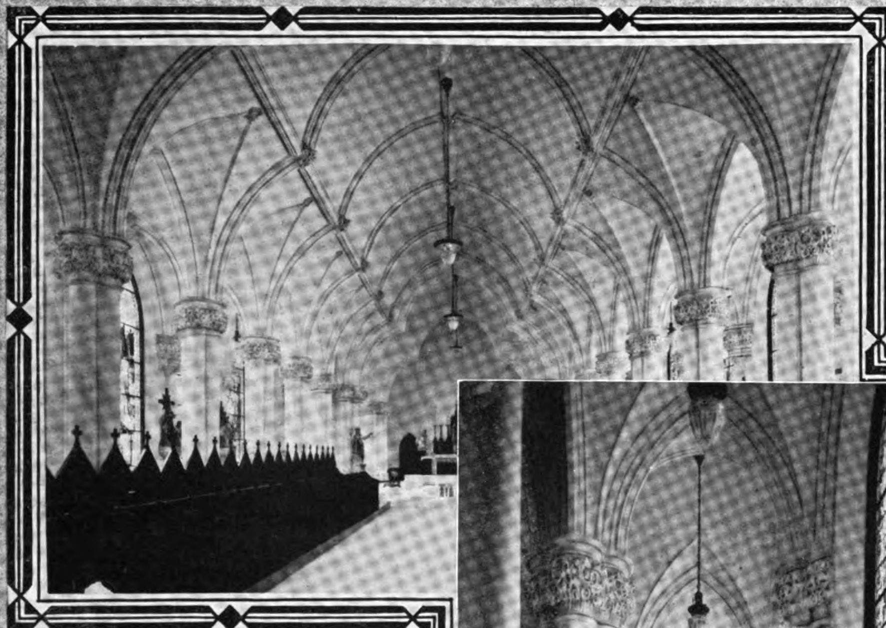
This enables the screen builder to secure a width that will cut to advantage—a further economy feature.

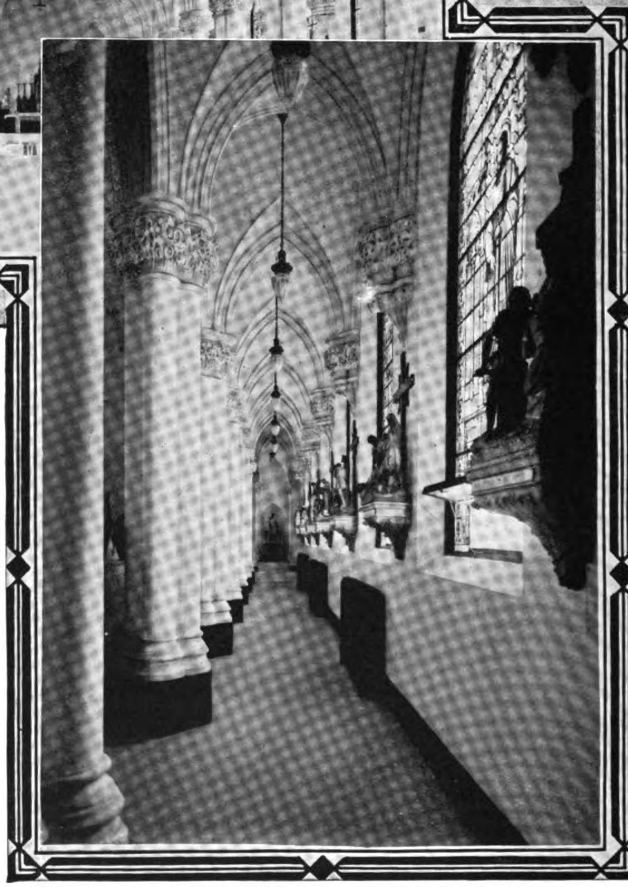
THE INTERNATIONAL NICKEL COMPANY
43 Exchange Place, New York
The International Nickel Company Canada, Ltd., Toronto, Ontario

The name Monel is given to a line of metal products produced by The International Nickel Company from a natural nickel alloy—67% nickel, 28% copper and 5% other metals. These products include Monel blocks, Monel rods, Monel castings, Monel wire, Monel strip stock, Monel sheets, etc. The name Monel identifies the natural nickel alloy as produced by The International Nickel Company.

screen

THE INTERNATIONAL NICKEL COMPANY





Costly Interior Decoration Requires a Non-Shrinking, Fireproof Plastering Base

The most carefully planned interior decorative treatment will be unsuccessful if the plaster is marred by streaks or cracks.

As a precautionary measure, therefore, when designing churches, libraries or other public buildings, hotels or fine residences, wherein elaborate interior decorations are to be used, most architects are careful to specify that all the plastering be done over a thoroughly dependable foundation, such as EUREKA or

Kno-Burn

METAL LATH

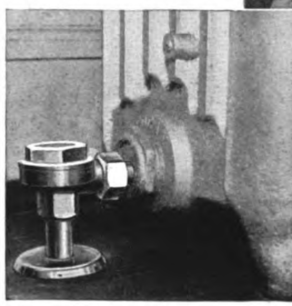
Not only is the *cost reduced*, but the steel mesh reinforces the plaster and provides a non-shrinking, fire-resisting base, which assures a permanently smooth surface, free from disfiguring cracks or streaks. Among the many buildings in which EUREKA or KNO-BURN Metal Lath has been used for interior work are the Camden Library, Camden, New Jersey; Sisters of Mercy Chapel, Webster Grove, Missouri; First National Bank, Blackstone Hotel, Omaha, etc.

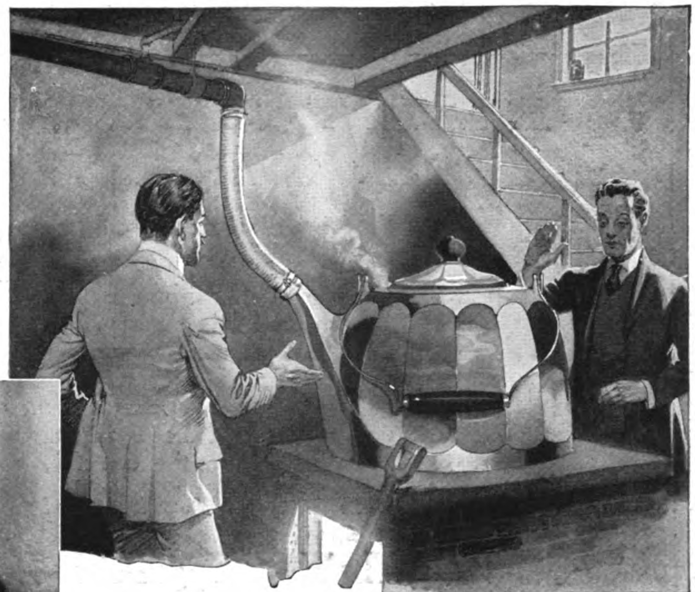
Samples of EUREKA or KNO-BURN with Handbook gladly sent

NORTH WESTERN EXPANDED METAL CO.

OLD COLONY BUILDING CHICAGO, ILL.

This small illustration shows how a Dunham Radiator Trap looks when fitted to a radiator. The trap is permanently adjusted at the factory—never needs attention.





It can be done if the tea kettle is large enough

For the good of the industry

Having materially contributed to the revolutionizing of low pressure steam heating by perfecting the Dunham Radiator Trap in 1893, we have always felt it our duty to continue the educational work. This our advertising in national publications is helping to do—acquainting all with the good features of low pressure steam heating.

In stating publicly that buildings can be heated with a tea kettle, if the kettle is large enough and each radiator Dunhamized, we have felt encouraging reactions all along the line. Even to some in the profession, it is surprising that even the Woolworth Building is heated on approximately one-pound pressure. Dunham Traps are used, of course.

"The Dunham Hand Book" supplements the data given in Sweet's Index, 14th edition, pages 1138 to 1143.

Dunham Specialties

Packless Radiator Valves
Radiator Traps
Drip Traps
Blast Traps
Air Line Valves
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Reducing Pressure Valves
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The DUNHAM
REG. TRADE-MARK
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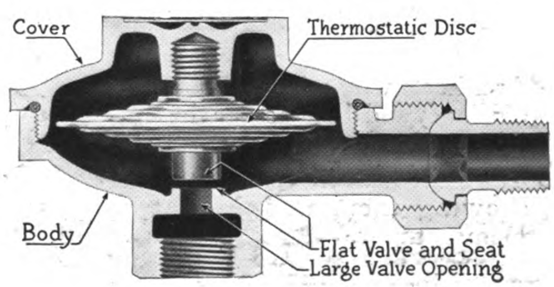

Cross-section of No. 2 Trap

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That is the unusual record made by Page Boilers.

Manufactured with the utmost care and skill in designs proven through tests and long use to be most efficient, these "heat-makers" have come to be looked upon as standard by architects and engineers throughout the country.

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The Wm. H. Page Boiler Co.

The oldest and largest makers of boilers exclusively

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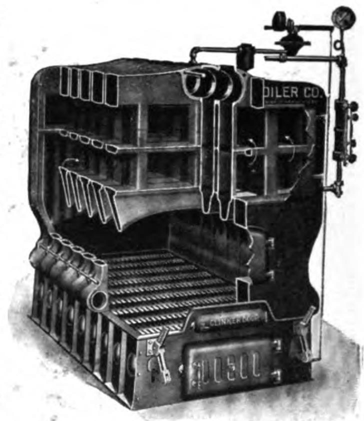
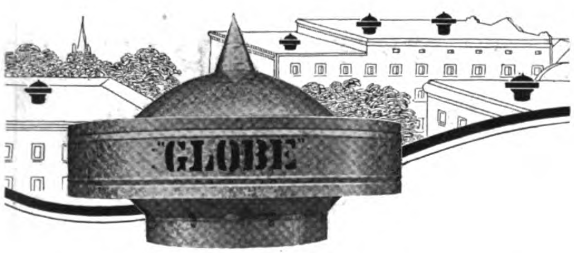


Volunteer

NEW YORK 141 W. 36th St. **BOSTON** 100 High St. **PHILADELPHIA** 1718 Sansom St. **CLEVELAND** Builders Exchange

Monarch

Makers of a complete line of Round and Square Boilers for every class of building



Wherever You See a "GLOBE"

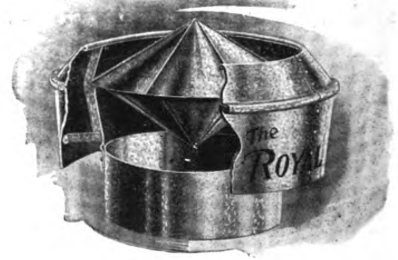
Wherever you see a "GLOBE" Ventilator (distinguished by its distinctive shape) you may be certain that that building is properly ventilated and ventilated automatically

Miniature working model Free to Architects who wish to prove the efficiency and demonstrate the simplicity of "GLOBE" Ventilators.

Your clients will appreciate your showing them this Miniature Demonstrator.

DEPARTMENT P

The GLOBE VENTILATOR CO., Troy, N. Y.



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Why Architects Everywhere Specify

Royal Double Cone Ventilators

Because — **ROYAL Ventilators have the following exclusive features**

1. **DOUBLE TAPERED OUTER FRUSTUMS.** The wind pressure deflected over and under the edges of the frustums constitutes a strong up draft.
2. **THE INVERTED CONE.** Placed directly in the center of ascending air, which, upon striking it, is deflected directly upward and outward.
3. **RADIATING RIBS IN THE CONES.** These prevent the air from swirling around, and also add to the firm construction.
4. **STRENGTH AND RIGIDITY.** Edgewise galvanized malleable iron braces, lapped seams, wired edges.
5. **GRACEFUL DESIGN.** They add to the appearance of every building.

See Page 812, Sweet's Catalog, or send for our catalog

Royal Ventilator Co., 415 Locust Street Philadelphia, Pa.

Sturtevant

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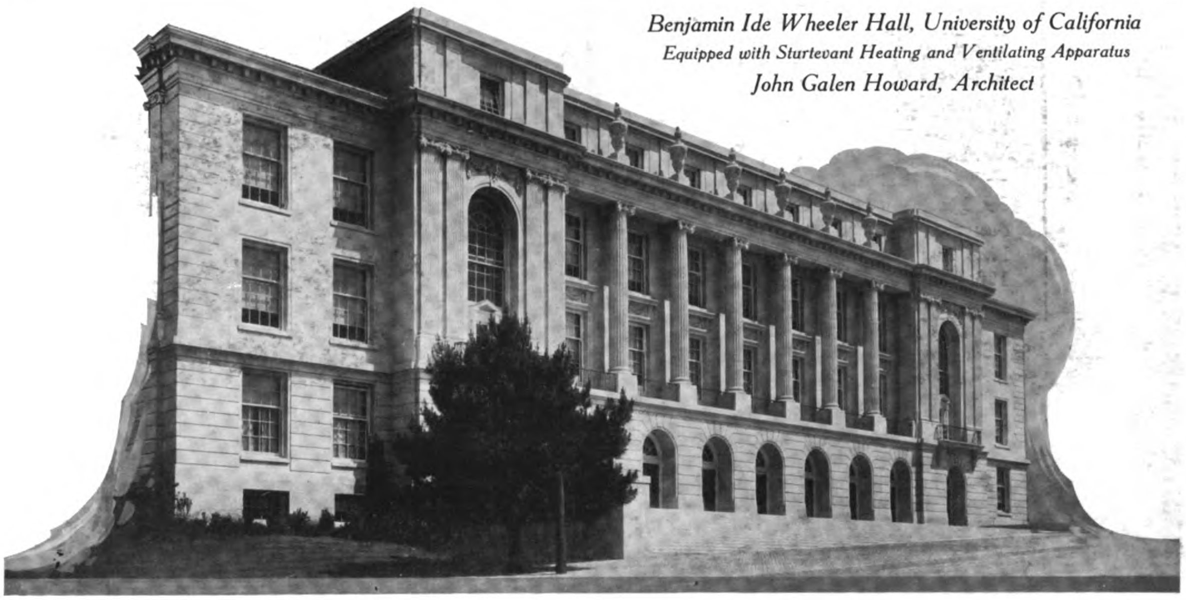
PUTS AIR TO WORK



Benjamin Ide Wheeler Hall, University of California
Equipped with Sturtevant Heating and Ventilating Apparatus
John Galen Howard, Architect

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THAT MEETS EVERY DEMAND OF ARCHITECTURE

JUSTICE to a worthy example of architecture demands that the mechanical equipment of the building be thoroughly efficient so that no detail of operation may detract from the full enjoyment of the architect's creation.

The B. F. Sturtevant organization of expert engineers offers architects — and their *engineers* — the assurance of heating and ventilating service that will afford to any building, large or small, equipment economical in installation and efficient in operation.

Qualified engineers are at your service in all important cities. They will be glad to discuss with you any heating and ventilating problem. Early consideration of this detail is desirable for the best results.

SEE OUR CATALOGUE IN SWEET'S

For quick, ready reference there are eighteen pages of helpful data on Sturtevant equipment in Sweet's Catalogue.

SEE OUR CATALOGUE IN SWEET'S

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A popular price hotel conducted on the European plan.

Owned and controlled by Maryland Hotel Co. Erected in 1902. President—James H. McTague. Manager — Edward W. Dunn. Steward — William Reel. 1000 guests served daily in dining room. Has 240 rooms and 120 baths.

Architect, Albert B. Groves

The Kitchens of the

HOTEL MARYLAND

(St. Louis)

are equipped with

"Wear-Ever"

Aluminum Cooking Utensils

"Wear-Ever" utensils are the logical equipment for hotels that appreciate the importance of maintaining a high standard of kitchen cleanliness and the good business of eliminating all unnecessary up-keep costs.

"Wear-Ever" utensils are clean, bright and silver-like. They have no joints or seams in which particles of food can lodge. Cannot rust; cannot chip — are pure and safe.

"Wear-Ever" *never needs tinning!*—A **"Wear-Ever"** equipment will be in use for years after it has saved its original cost on this one item alone.

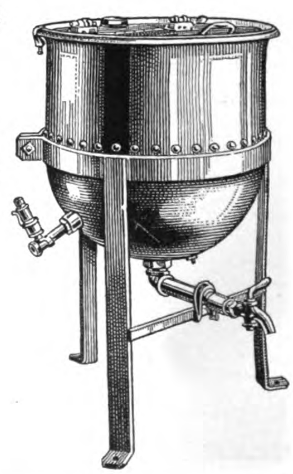
Replace utensils that wear out with utensils that **"Wear-Ever"**

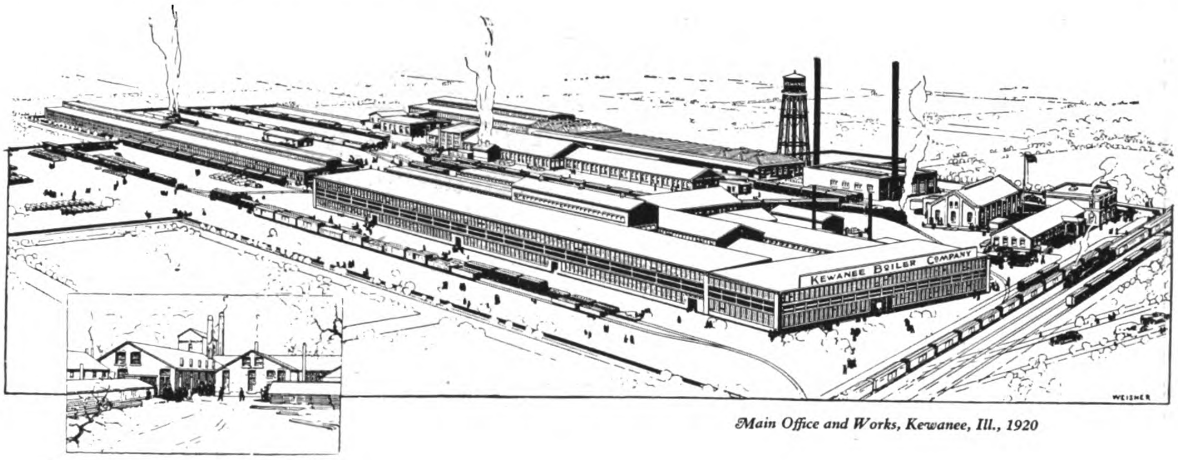
See Sweet's Architectural Catalog and the American Architects' Specification Manual for specification data on **"Wear-Ever"**

The Aluminum Cooking Utensil Co., New Kensington, Pa.

In Canada **"Wear-Ever"** utensils are made by Northern Aluminum Co., Limited, Toronto, Ont.

WEAR-EVER
T.A.C.
ALUMINUM
U.C.Co.
TRADE MARK





Main Office and Works, Kewanee, Ill., 1920

Main Office and Works, Kewanee, Ill., 1900

20 Years of Progress

20 years ago less than two acres of ground were required. Today a boiler shop and radiator plant occupy a 32-acre tract of land.

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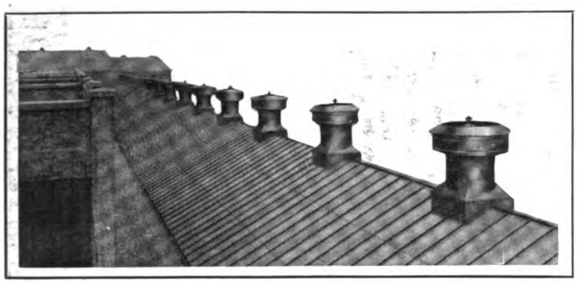
Pittsburgh, Pa. .... Arrott Building	*Kansas City, Mo. .... 1412 W. 12th Street
*Cleveland, O. .... Schofield Building	Cincinnati, O. .... Mercantile Library Building
*Detroit, Mich. .... Dime Bank Building	*Seattle, Washington .... Smith Building

*Warehouse Stocks at these points



"Star" Ventilators

PATENTED

THE oxygen in fresh air is the primary support of life and nothing can compensate its absence.

Good ventilation will keep workers cheerful — it pays dividends in increased and better production.

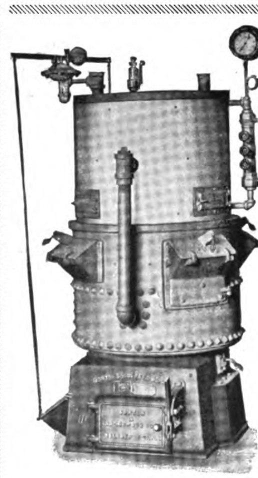
"Star" Ventilators will solve your ventilating problems satisfactorily, as well as economically.

Send for our Ventilator Booklet

MERCHANT & EVANS Co

PHILADELPHIA

NEW YORK, BALTIMORE, LANCASTER, PA., ATLANTA, KANSAS CITY, CHICAGO, DETROIT, CLEVELAND, WHEELING



Durability

of the **Gorton Self-Feeding Boiler** is demonstrated by the fact that many of the boilers installed over 25 years ago are still in use giving entire satisfaction.

Efficiency

The **Gorton Self-Feeding Boilers** are built on the lines of Power Boilers, using the same material, thus securing the greatest Strength, Durability, and highest Efficiency.

The **Gorton Self-Feeding Boiler** gives a steady heat with attention only morning and night; its construction insures complete combustion of the gases and prevents the waste of coal.

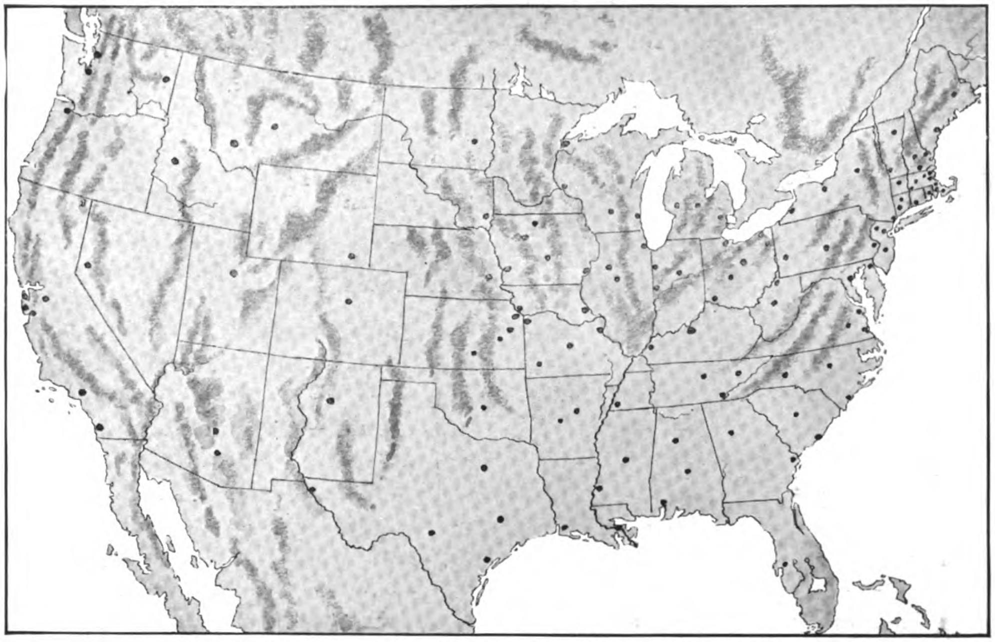
See pages 2, 3, 4, 6, 8, 10, 11, and 13 of Catalog No. 88.

OUR NEW NO. 88 CATALOG IS READY — WILL BE SENT UPON REQUEST

Gorton & Lidgerwood Co.

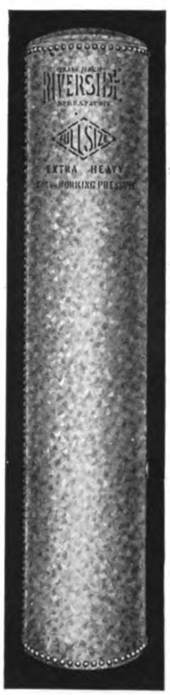
96 Liberty Street, New York

All Gorton Self-Feeding Boilers built to the "A. S. M. E. Standard"



The Black Dots Show Main Jobbing Points for "Riverside" Range Boilers

BUILT FOR THE NATION—



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

Riveted and Brazed Range Boiler

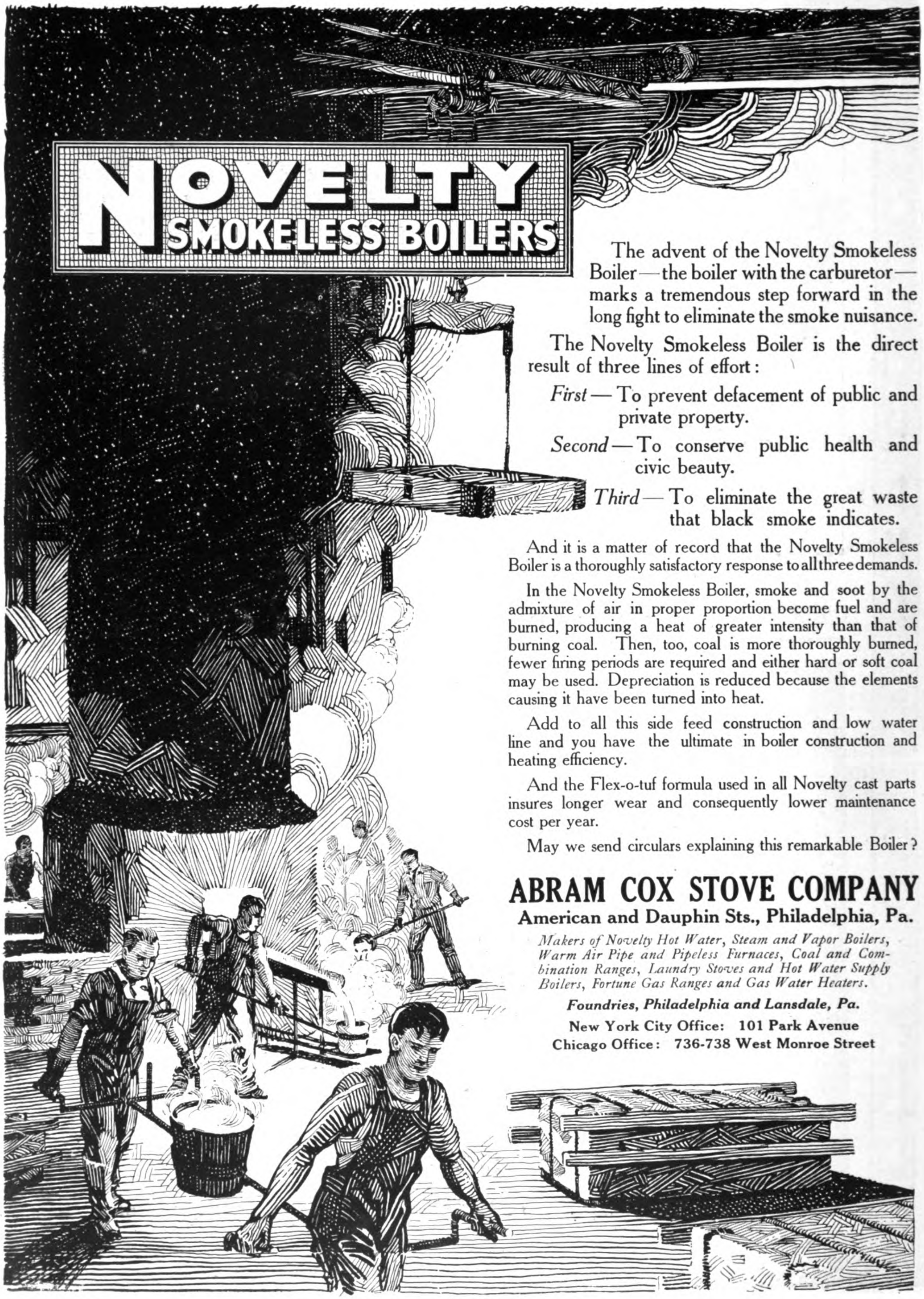
This National Distribution is a protection to your reputation and means a satisfied client. The "Riverside" stands up to high pressures all over the U. S. as well as low pressures. National Distribution means that all "Riverside" Boilers must be tested to excessive pressures so that no matter where they are installed they will stay tight.

Specify "Riverside" "Kopsteel" Double Extra Heavy Range Boilers. They are guaranteed for six years at 150 lbs. working pressure. They will cost about one-third more than the ordinary boiler, but are well worth it.

SEND FOR SAMPLE SEAM

Riverside Boiler Works, Inc.

The Range Boiler Builders - - **Cambridge, Mass.**



The advent of the Novelty Smokeless Boiler — the boiler with the carburetor — marks a tremendous step forward in the long fight to eliminate the smoke nuisance.

The Novelty Smokeless Boiler is the direct result of three lines of effort:

First — To prevent defacement of public and private property.

Second — To conserve public health and civic beauty.

Third — To eliminate the great waste that black smoke indicates.

And it is a matter of record that the Novelty Smokeless Boiler is a thoroughly satisfactory response to all three demands.

In the Novelty Smokeless Boiler, smoke and soot by the admixture of air in proper proportion become fuel and are burned, producing a heat of greater intensity than that of burning coal. Then, too, coal is more thoroughly burned, fewer firing periods are required and either hard or soft coal may be used. Depreciation is reduced because the elements causing it have been turned into heat.

Add to all this side feed construction and low water line and you have the ultimate in boiler construction and heating efficiency.

And the Flex-o-tuf formula used in all Novelty cast parts insures longer wear and consequently lower maintenance cost per year.

May we send circulars explaining this remarkable Boiler?

ABRAM COX STOVE COMPANY

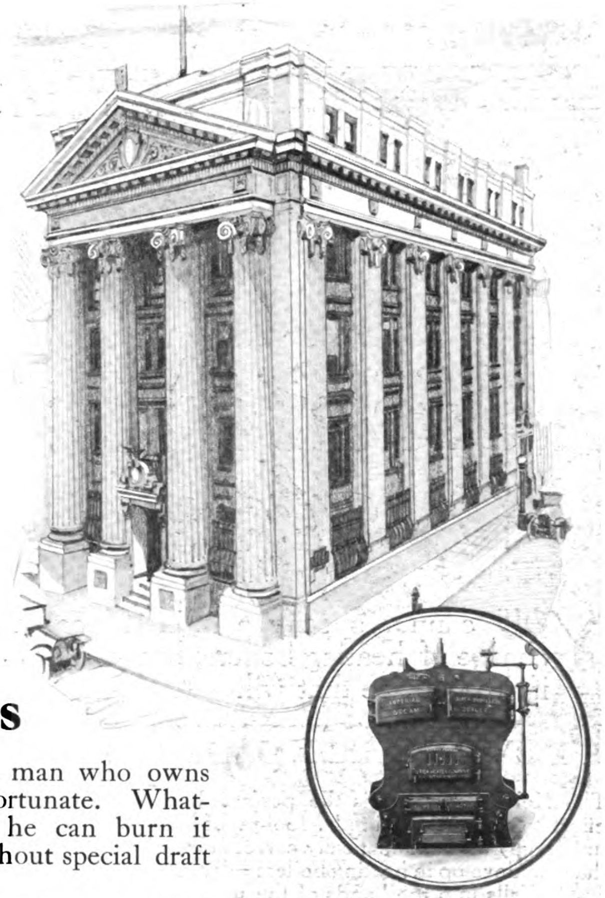
American and Dauphin Sts., Philadelphia, Pa.

Makers of Novelty Hot Water, Steam and Vapor Boilers, Warm Air Pipe and Pipeless Furnaces, Coal and Combination Ranges, Laundry Stoves and Hot Water Supply Boilers, Fortune Gas Ranges and Gas Water Heaters.

Foundries, Philadelphia and Lansdale, Pa.

New York City Office: 101 Park Avenue
Chicago Office: 736-738 West Monroe Street

American Exchange National Bank
Nashville, Tenn.
Mowbray & Uffinger, New York City, Architects
Heated by Imperial Super-Smokeless Boiler
John Bouchard & Sons Co.
Heating Contractors



Even with Low Grade Fuel Results are Marvelous

IN these days of uncertain fuel supply the man who owns an Imperial Super-Smokeless Boiler is fortunate. Whatever grade of fuel he is able to obtain, he can burn it successfully in this boiler without smoke, without special draft and with maximum economy.

This is due entirely to the Hot Blast Chamber located at the rear of the fire-box. Through this chamber must pass all gases and smoke. Here they are mixed with a stream of air (oxygen) and are completely consumed. Their high latent heat is applied to the water surfaces instead of being lost up the chimney.

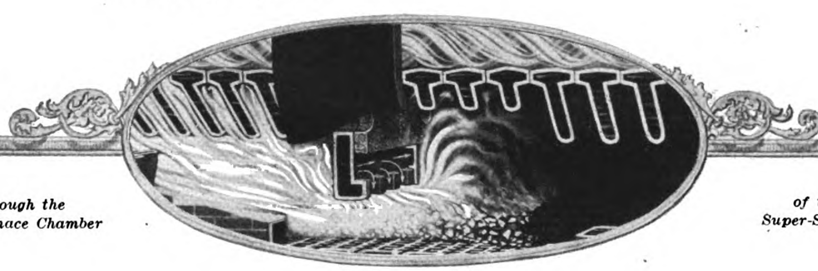
We shall be pleased to supply for your files full data, a list of installations and opinions of architects and owners.

Utica Heater Company - Utica, N. Y.

218-220 W. Kinzie Street, Chicago, Ill.

Branches in principal cities

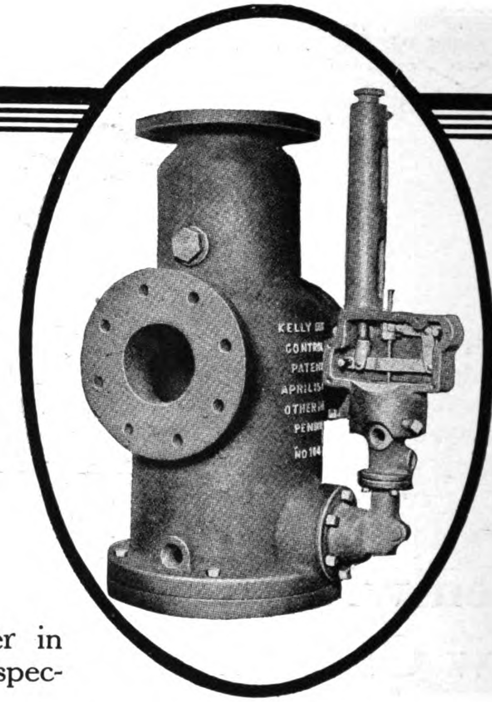
A 20-7



Section through the Hot Blast Furnace Chamber of the Imperial Super-Smokeless Boiler

Imperial Super-Smokeless Boilers

The Final Touch to the Heating System



YOU cannot specify a trained engineer in charge of heating boilers, but you *can* specify the device that will

Prevent Explosions and Cracked Sections

The Kelly Controller is the perfected result of years of effort to produce a simple, fool-proof device which will unfailingly and automatically correct every faulty condition that can develop in heating boilers — even when the heating system falls into the hands of the most unskilled operator.

It immediately meets impending dangers and forestalls accidents, restoring the boiler to normal operation.

Accorded the Fairbanks "O.K."

After rigid tests covering every condition that can arise in actual service, the Kelly Controller has received that well-known stamp of proven merit — The Fairbanks Company "O.K."

Stock carried by following Fairbanks branches

ALBANY, BALTIMORE, BIRMINGHAM, BRIDGEPORT, BOSTON, BUFFALO, CHICAGO, DETROIT, HARTFORD, NEWARK, NEW ORLEANS, NEW YORK, PATERSON, PHILADELPHIA, PROVIDENCE, ROCHESTER, SCRANTON, ST. LOUIS, SYRACUSE, UTICA, WASHINGTON, CLEVELAND, PITTSBURGH

FAIRBANKS O.K. THE FAIRBANKS COMPANY

When a slight surging condition occurs, the water which threatens to foam over into the system is deflected into the controller chamber and returned to the boiler through a bleeder pipe.

If ordinary steam separation is inadequate, an automatic water valve supplies the boiler with just enough feed water to reduce the temperature of the overheated surging water and correct the condition.

If, through carelessness or ignorance, the attendant continues to fire the overheated boiler, the controller goes a step farther and completely cuts off the boiler from the system, at the same time gradually reducing the water temperature. Since syphoning is impossible, explosions are absolutely prevented. Controller takes the place of the steam header and is just as easily installed.

Manufactured by

THE KELLY CONTROLLER CO.

175 West Jackson Boulevard CHICAGO

Distributed Exclusively by

THE FAIRBANKS CO., *Administrative Offices :* **New York**

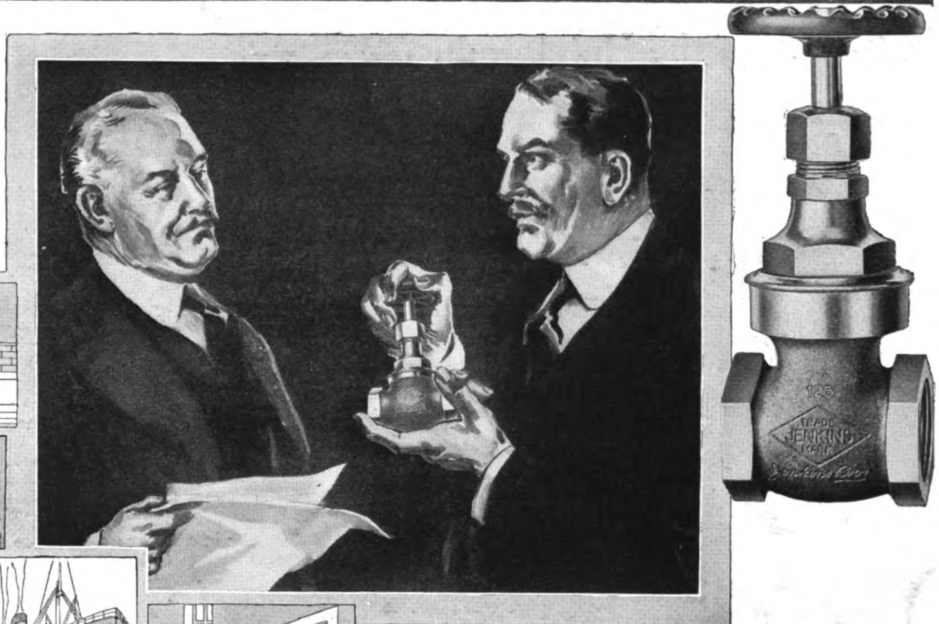
Branch Offices Listed Opposite

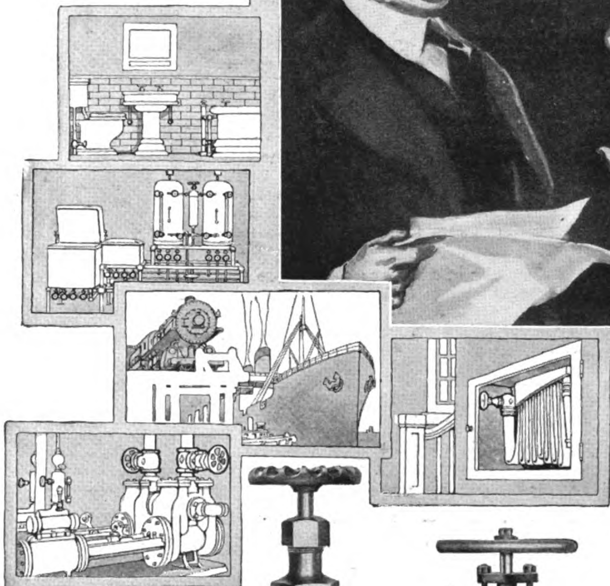
Kelly Controller

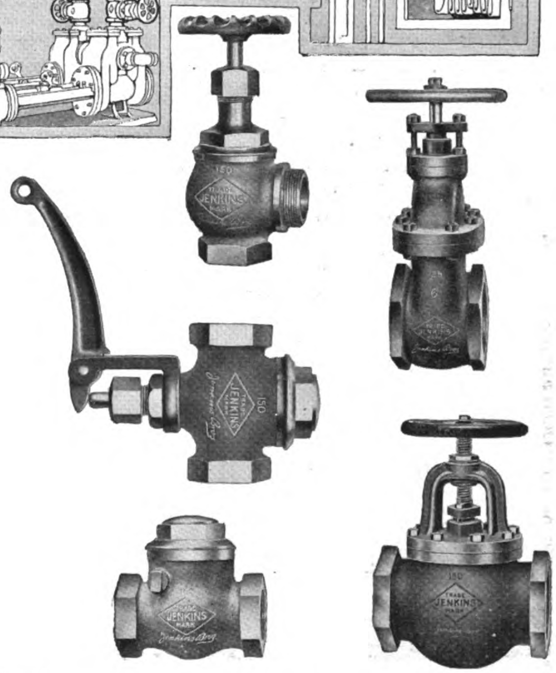
"The Boiler Master"

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

Jenkins Bros.







Assured Dependability

ARCHITECTS can specify, engineers can recommend, plumbers and steamfitters can install Jenkins Valves with confidence born of a knowledge that Jenkins Valves have been standard for more than 55 years. Home owners having plumbing and heating systems equipped with Jenkins Valves are assured of dependability and freedom from valve annoyance.

Every Jenkins Valve is strong and heavy; made of the best brass, iron or steel, and so proportioned that it remains dependable and unaffected when subjected to the strain of hard usage and severe service.

The valves illustrated are of the types commonly used in plumbing. Jenkins Valves are also made to meet the requirements of power plant service, high and low pressure; of plumbing and heating service in the home, office, factory, hospital and public building; of railroad, roundhouse and marine service; and of any service where a substantial, satisfaction giving valve is demanded.

SPECIFY: All valves shall be genuine JENKINS, bearing the name "JENKINS" within a diamond mark.

JENKINS BROS.

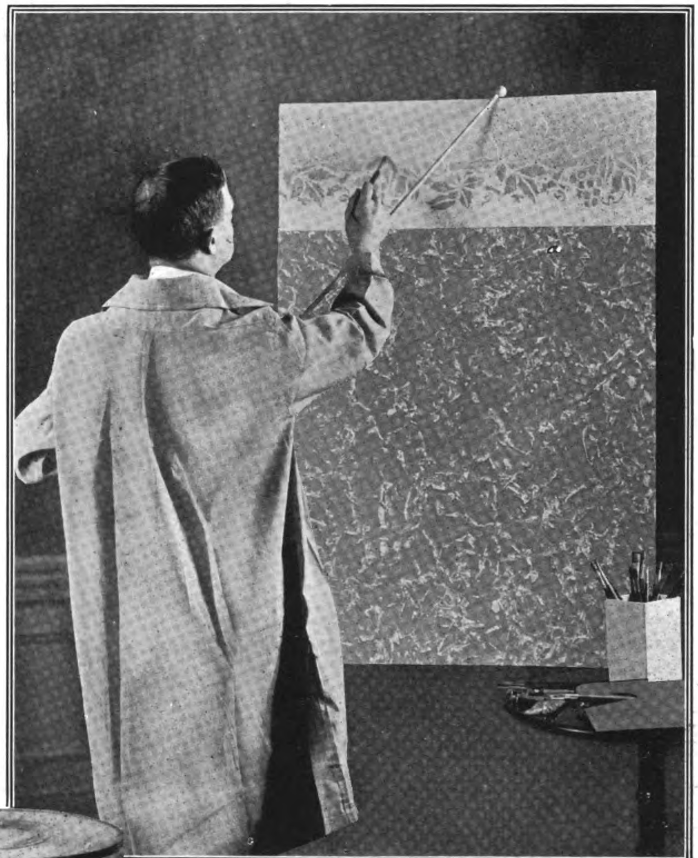
New York, St. Louis, Chicago, Boston, Montreal, Philadelphia, San Francisco, London, Havana, Washington, Pittsburgh

2242-J

Jenkins Valves

SINCE 1864

DEVOE VELOUR FINISH



Devoe Velour Finish is the perfect flat finish, washable oil paint for all interior walls, woodwork and ceilings.

Its perfect blending qualities allow a unique yet simple method of manipulation producing many beautiful Mottletone effects.

Our Decorative Service Department has worked out harmonious color schemes for a number of large public institutions and private homes and will be glad to submit decorated panels for your inspection.

DEVOE

The oldest paint manufacturing concern in the United States. Founded 1754

Devoe & Raynolds Co., Inc.

NEW YORK
101 Fulton Street

CHICAGO
14 West Lake Street

Paints

Varnishes

The Luxeberry Painter Says:

" 'ALL IS NOT GOLD THAT GLITTERS'

is one of the old sayings I think of when I see finished surfaces with the lustre faded out. Even a shoddy varnish may look handsome for a while, but it soon betrays its pedigree like a gold-plated watch case.

"I always use Berry Brothers' Varnishes, Enamels and Stains whenever I can because I know they are pure gold right through, combining lasting beauty with the greatest legitimate economy."

This high-grade efficiency is an especially valuable asset for specification writers.

BERRY BROTHERS INC.
World's Largest Makers
Varnishes and Paint Specialties

Detroit, Michigan **Walkerville, Ontario**

258

Considering Cypress' distinctive and unequaled merits, it is no wonder that

"CLIENTS ARE GETTING INTERESTED IN TRADEMARKED "TIDE-WATER"

TRADE MARK REG. U.S. PAT. OFFICE

CYPRESS

(The Wood Eternal)"

They ought to be interested. It's good for them.

SPECIFY ABOVE MARK—INDELIBLY STAMPED ON EVERY BOARD OR BUNDLE. JUST TELL YOUR DEALER YOU KNOW THE DIFFERENCE. (HE DOES, TOO.)

Communicate with our "ARCHITECTS' DEPARTMENT." Our entire resources are at your service with Reliable Data.

Southern Cypress Mfg. Ass'n.

1234 Perdido Building, New Orleans, La. **1234 Heard Nat'l Bank Building, Jacksonville, Fla.**

INSIST ON TRADE MARKED CYPRESS AT YOUR LUMBER DEALER'S. IF HE HASN'T IT, LET US KNOW IMMEDIATELY.

E.S. 1827 & CO.

Nearing the Century Mark in VARNISH MAKING

Our products have been specified by architects *continuously for ninety-three years.* What endorsement could be greater?

Trade **Artisto Finish** Mark

Years of use have proved its durability—its economy

Produces a rich, dull, artistic finish over natural wood or stained work. Accentuates the beautiful grain of the wood and its coloring, with a freedom from defects too often the result of wax finish.

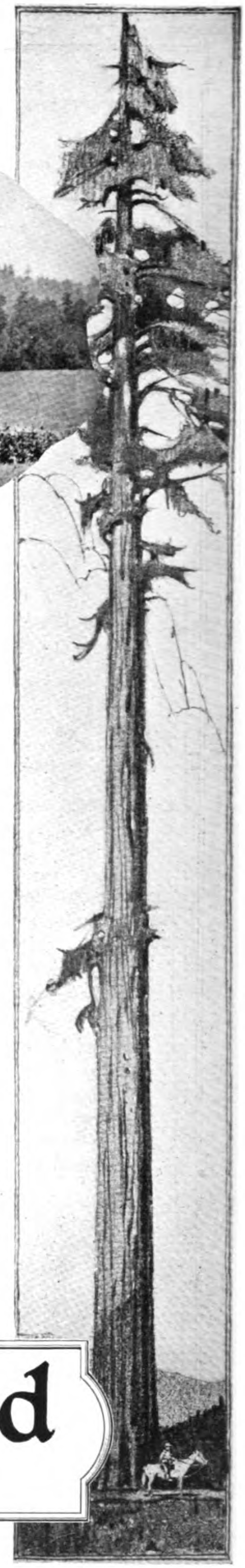
Will not scratch or mar white. Is waterproof. Dries hard overnight.

We also manufacture highest grade, guaranteed Enamels and Floor Finishes.

Have you our Booklets? Send for finished panels

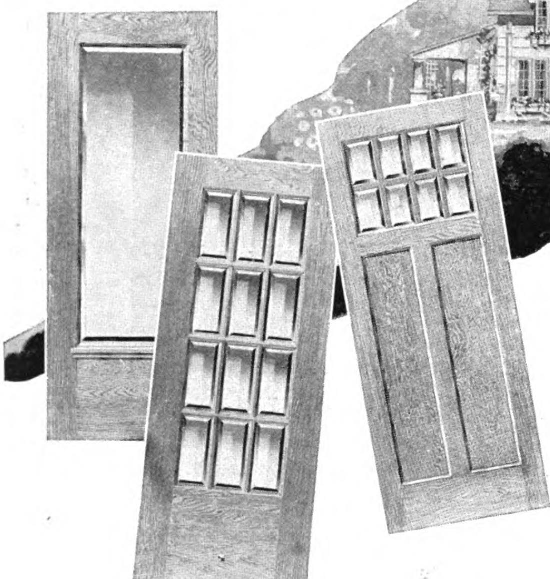
EDWARD SMITH & CO.

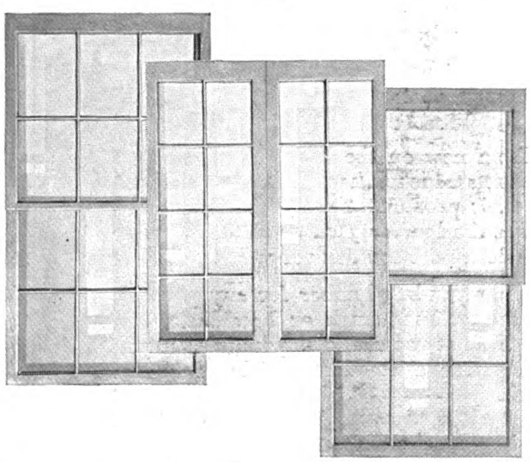
West Avenue, 6th and 7th Streets, Long Island City
P. O. Box 76, City Hall Station, New York City
Western Branch, 3532-34 South Morgan Street, Chicago



Long-Bell

WHITE PINE DOORS *and* WINDOWS

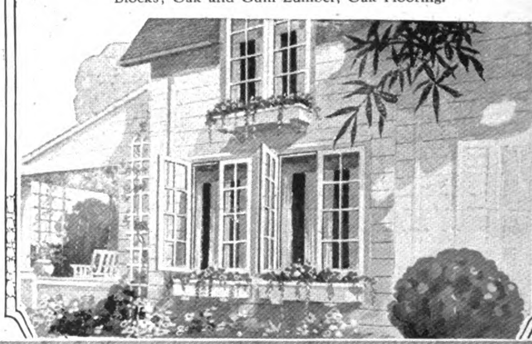




Long-Bell doors and windows, made at Weed, California, are known to be of the highest quality—yet they cost no more.

—Ask Your Lumberman

Long-Bell products include California White Pine Doors, Veneers, Sash, Lumber, Standardized Woodwork; Southern Pine Lumber and Timbers; Creosoted Lumber, Timbers, Posts, Poles, Ties, Piling, Wood Blocks; Oak and Gum Lumber, Oak Flooring.



FREE BOOKLET, "THE PERFECT FLOOR"
How Oak Floors should be *Laid, Finished* and *Cared For.* Information every builder and home owner should know.
Send a post card to-day

The Long-Bell Lumber Company

R. A. LONG BUILDING   Lumbermen since 1875   KANSAS CITY, MO.

Features That Characterize a Floor

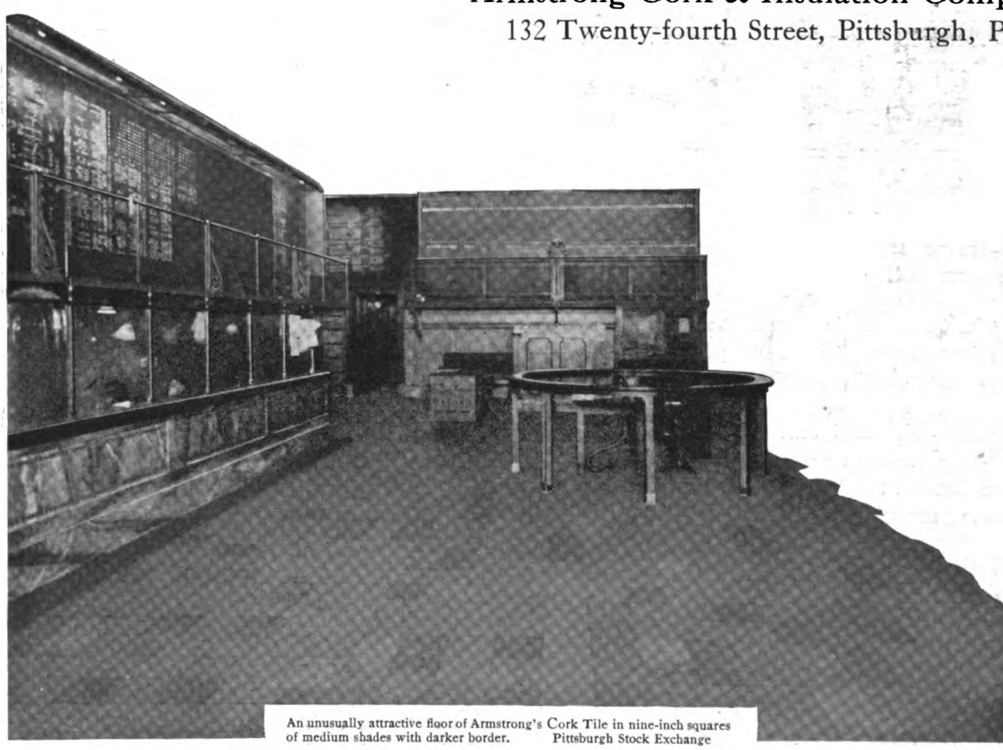
DISTINCTIVE character or identity has the same value in a product that personality has in a man. To be peculiarly itself in aspect and performance and not an imitation of something else is decidedly a virtue.

Armstrong's Cork Tile has that quality of individuality. It makes no pretense of being other than what it is — cork. It is not made to resemble wood, or marble, or tile, or carpet. It has no color or grain not inherently its own.

And in the characteristics of Armstrong's Cork Tile lies its peculiar charm. No more pleasing effect, for example, could be desired than that obtained with its distinctive mottled appearance in soft shades of brown. So, too, with its "feel" underfoot — not merely soft and yielding, but with the lively resilience of natural cork — a comfortable, warm, non-slippery and noiseless floor.

The illustrations (in color) and the description in the booklet, "Armstrong's Cork Tile," will give you a good idea of the characteristic qualities of this floor. A copy and a sample will be mailed free on request.

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



An unusually attractive floor of Armstrong's Cork Tile in nine-inch squares of medium shades with darker border. Pittsburgh Stock Exchange

ARMSTRONG'S CORK TILE

REGISTERED U.S. PAT. OFF.

90,000 Square Feet of Floor Space *Treated with*

GF No. 145 Crystalrox

A concrete hardener that insures your floors against crumbling and dusting.

Sperry Flour Company treated the floors of their new building with Crystalrox in March, 1918. It has proven successful.

1 GF No. 145 prevents all concrete surfaces from dusting and crumbling.

2 GF No. 145 is a concrete floor insurance. It insures a perfect floor for years.

3 GF No. 145 can be applied after a day's work is done and the floor is ready for use the following morning.

4 GF No. 145 is a perfect hardener. Satisfied customers are the best proof. Read the letter of one of the many satisfied users.

PLANT MORE WHEAT

SPERRY PRODUCTS IN EVERY HOME SPERRY FLOUR

SPERRY FLOUR CO.

MILLS
TACOMA WASH
CRESTON, WASH
STOCKTON CAL
VALLEJO, CAL
CHICO, CAL
MARYSVILLE, CAL
FRESNO, CAL
SALINAS, CAL
PASO ROBLES, CAL
LOS ANGELES, CAL

GENERAL OFFICES
SAN FRANCISCO

CABLE ADDRESS "SPERRY"
A B C CODES 4TH AND 5TH EDITION
LIEBERS STANDARD CODE
TYBO CODE

Spokane, Washington,
October 26th, 1920.

D. E. Fryer & Company,
Paulsen Bldg.,
Spokane, Washington.

Gentlemen: Attention: Mr. Hoffman.

In response to your request for information as to the service that the floor hardener which was used in this building was giving us, will reply as follows.

The writer, while not actually here during the building operation, is thoroly familiar with the fact that Crystalrox as manufactured by the General Fireproofing Company and sold through your concern was applied over some 90,000 sq. ft. of floor area in this building. This material was applied in March, 1918, and the floors have given excellent service since that time and upon inspection on this date, over two and one-half years later, find that they are in perfect condition in spite of the heavy trucking over certain areas.

Consequently we do not hesitate to recommend Crystalox as an excellent floor hardener.

Yours very truly,
SPERRY FLOUR COMPANY.
By J. K. Smith

THE GENERAL FIREPROOFING COMPANY

YOUNGSTOWN, OHIO

BUFFALO	CHICAGO	NEW YORK	BOSTON	MILWAUKEE	KANSAS CITY
OMAHA	ATLANTA	MINNEAPOLIS	SAN FRANCISCO	PHILADELPHIA	BALTIMORE

Index to Advertising Announcements

THE BRUNSWICK-BALKE-COLLENDER CO.
WHALE-BONE-ITE
REG. PAT. OFFICE
CLOSET SEATS

THE QUALITY TOILET SEAT

CUT SHOWS
No. 23-9 SEAT

CONSTRUCTION OF
WHALE-BONE-ITE SEAT

D—NOTE CONCEALED HINGE
C—NOTE HEAVY COVERING
B—RUNS LENGTHWISE
A—NOTE THE COUNTER LAYER OF LAMINATION—THIS RUNS ACROSS SEAT

Industrial Plants Toilets
Demand Seats that are Durable and Readily Cleaned

WHALE-BONE-ITE is being used in a large number of plants whose Engineers have thoroughly tested the Seat both academically and in use.

—Result--Satisfactory proof of our claims.

—WHALE-BONE-ITE is impervious, shows dirt readily account of high lasting polished surface, which is not superficial but thick, which wears a lifetime.

—No metal hinges on top or bottom.

—Our patented concealed hinges are rigid and fool-proof--reducing corrosion and verdigris accumulation to a minimum.

—Your recommending this up-to-date fixture means satisfied clients.

—Types for all Standard bowls.

—Catalog on request. Ask your plumber or plumbing fixture jobber or *Seat Dept.* of the makers.

MADE BY
THE BRUNSWICK-BALKE-COLLENDER CO
623 SO. WABASH AVE. CHICAGO


Every type of building presents a different elevator problem. The accumulated engineering experience of this organization enables it to meet the conditions in the finer buildings of every type.
SEND FOR PHOTOGRAPHS OF K & H INSTALLATIONS IN ANY TYPE OF BUILDING
KAESTNER & HECHT CO.
ELECTRIC ELEVATOR BUILDERS
500 SOUTH THROOP STREET
CHICAGO

There must be no "Weakest Spot"

When a chain — or a paint film — gives way in just one place, the result is disaster.

Tiny breaks, here and there, in the coat of paint on a building mean that it must be repainted, or there will be a gradual disintegration of the whole surface, and decay beneath the surface.

Trust to "Lead and Oil"

Then let the paint you use be Dutch Boy White-Lead and pure linseed oil — an armor invulnerable at every point.

This paint is waterproof. It contracts and expands with the wood into whose pores it fastens, and will not crack or scale.

The economy of Dutch Boy

Paint is only a small part of the cost of painting. Labor is the big item. And it costs no more to apply good paint than poor paint.

Dutch Boy White-Lead paint costs less, figured by the gallon, square yard or years of service. As it is mixed to order, you can have the exact color you want.

Harmony and individuality are shown in the portfolio of color suggestions for home decoration, which we will be glad to send you for ten cents.

NATIONAL LEAD COMPANY

New York Buffalo Cleveland Cincinnati Boston Chicago San Francisco St. Louis

JOHN T. LEWIS & BROS. CO., Philadelphia
NATIONAL LEAD & OIL CO., Pittsburgh

Dutch Boy White-Lead

Save the surface and you save all — *White Lead saves the surface*

THE BARTA PRESS, BOSTON