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Place of next Convention, Chicago, August, 1893.

**Inexcusable
Blunder
by the
Government.**

Among the changes brought about by the political system under which the business of the United States is misconducted when a political party loses control, one lately made in the office of supervising architect is the most deplorable and fatal to the business interests involved in the prosecution of public work. The new supervising architect, Mr. Jeremiah O'Rourke, of New Jersey, is a gentleman of exceptional architectural learning, and one who, besides being a member of the American Institute of Architects, enjoys the respect of every member of the profession who is so fortunate as to have known him. But it is in the working department, that in which politics should never enter, that gross injustice as well as what will prove a most costly mistake has been made, and this is in the discharge of the assistant and chief clerk, Mr. H. C. McLean. We have no voice in politics and recognize no situation in the case but that of plain business and plain justice. Both, in the case of the summary discharge of this gentleman have been violated, and that in a manner that is probably unique even in the history of offices held under the patronage of a political party. Mr. McLean when a boy of fourteen was his father's (General G. W. McLean) secretary, and participated in the battle of Bull Run. Losing the support of his family, his father and eldest brother both losing their lives in the service, he was, through the recommendation of men whose names are national, appointed a page in the house. From this Mr. McLean was through successive congresses appointed to and creditably filled the offices of assistant superintendent of document room, subsequently becoming prompter of the speaker. Then, after serving as private secretary to George H. Pendleton, was appointed to a clerkship in the office of the third auditor of the treasury. In 1866 the then supervising architect, A. B. Mullet, and the United States treasurer, F. E. Spinner, simultaneously asked the secretary of the treasury that Mr. McLean be detailed to their respective departments. Mr. McLean selected that offered by the supervising architect, and to this date has filled every grade through successive promotions from charge of leases, bonds and contracts to that of chief of division of repairs. It took twenty years to work through these several divisions, and every promotion was governed by merit. No investigation of the many that have visited the office of the supervising architect has ever touched its chief clerk. The designing and construction of public buildings has for years been conducted upon a system which has given to the country the worst buildings in design in the world, and architects yearly petition congress to change this system. No greater argument can be found in favor of such change or stronger evidence of the thorough rottenness of the present system than this case, wherein we enter our protest, by which the only individual, living or dead, in the history of the department who has successively filled faithfully and well every position of trust in it, is relieved from his office without even the courtesy of time extended those who are discharged for cause. The supervising architect under the present system never designs; he can hardly sign the papers that come before him, and his ability or his removal does not affect the credit of the office; but with the removal of one

who has filled each successive position to the highest, and through the most important years of its existence, it is different, and the loss of such a servant in the building department of our government cannot be computed any more than it can be replaced, and those responsible for this blunder will not probably realize its enormity until too late to repair it.

United States Timber Test Work. It is to be regretted that the house and senate of the last congress failed to act upon the proposed appropriation for the government timber test work. It is hoped that

the coming session will take immediate and liberal action. It is a project in which all railroad engineers, architects and others are interested, and those who at the last session were so active in urging the matter upon their representatives and the committee on manufacturing, in whose hands the bill has lain for many months, will not cease their efforts, and that all the professions interested will urge upon their representatives the passage of the bill. This is the only way to secure this much-needed, appropriation for the continuance of government tests in the Forestry Division.

Columbian Exposition Art and Architecture. According to the programme which was outlined two years ago, the buildings for the reception and display of exhibits for the Columbian Exposition are finished and will be formally opened May 1. This means that the buildings are actually finished and that the landscape part of their ornamentation is only delayed for a week or two because the exceptionally prolonged cold weather has not permitted the improvement of the grounds till within the last few weeks. The exhibits are rapidly arriving and being placed, and while the opening day will find the buildings in a somewhat chaotic condition, this Exposition will probably surpass its predecessors in the matter of promptness of installation as well as in every other respect. It is to the Fine Arts department that the architect, after his survey of the structures themselves, will be especially attracted, and the extent and character of the fine arts display will be a surprise. Beginning with the buildings and approaching the Fair by water, as from that direction can the most effective view of the whole be obtained, those who have traveled abroad will be reminded of the approach to Venice. Each building will have its own attractiveness, but the Government building will be voted a blot upon the otherwise superb combination of architectural and landscape effects. In the art gallery is about 200,000 square feet of wall space, of which about 35,000 feet is devoted to America, 29,500 feet to France, and other foreign countries in proportion to their requirements. There will be a better, more comprehensive representation of the art of the world than ever before presented, and the discrimination to which all exhibits have been subjected will give to this display the best of French, English, German, Scandinavian, Russian, Dutch and Italian art, and also accord to the art of these countries a greater degree of recognition than ever before enjoyed. In the architectural section the first disappointment will be met. Here, where there should be found the largest expression of the art of arts, but a few and very insignificant representations can be found. Through some blunder of the committee in charge architects were not informed of the requirements until too late to be fitly represented, and the rules which drew a broad distinction

between a painting of a building and a drawing would not admit of an exhibit except from a water-color artist's standpoint. Architecture as an art has been ignored. Perhaps not intentionally, but in effect. The committee of the Worlds' Congress Auxiliary, after months spent in trying to obtain a ruling by which their intended exhibit could be made, after finding that such an exhibit would have to be made independent of the Exposition, and that all expense attending the collection and shipment as well as a gallery for exhibition would have to be borne by the committee, decided that it was impossible to carry out the project in a creditable manner and it was abandoned. But the real architectural exhibit after all will be found in the buildings. The stupendous amount of work accomplished and the constructive problems involved, the design of each and the grouping of the whole, the sculpture that has at once marked an epoch in this art—all will give to the visiting architect the keenest enjoyment, the most practical knowledge that can be obtained by viewing the architectural creations of any land.

The World's Congress of Architects of 1893. Final arrangements have been made whereby the great gathering of the architectural profession of the world may meet at Chicago during the Columbian Exposition, and exchange those experiences and comparison of methods that otherwise are only obtained through the architectural press. A great many difficulties have confronted the committee of the World's Congress Auxiliary, and one project, that of a large and comprehensive exhibit of architectural drawings and models, had to be abandoned; but the congress is an assured fact and will meet for the week commencing with July 31. The following circular letter has been sent out by the World's Congress Auxiliary of the Columbian Exposition, upon a congress of architects through its committee:

TO THE ARCHITECTS OF ALL COUNTRIES.

GREETING: Among the congresses to be held in Chicago during the Exposition season, under the auspices of the World's Congress Auxiliary, is an international congress of architects, to convene during the week commencing July 31, 1893, in the Permanent Memorial Art Palace, on the lake park front of Chicago, near the center of the city. The object of this congress is to bring together the eminent architects of all countries for friendly intercourse, comparison of methods and results, and the promotion of their mutual interests in the profession.

What is particularly desired from the leading architects of each country is a clear and graphic presentation of the progress, achievements and special lines of development in architecture. To this end the following subjects have been selected:

Workingmen's houses; modern apartment houses; ancient apartment houses; laundries in houses, health effect; kitchens in houses, health effect; modern stables, large and small; responsibility of architects in constructional matters; responsibility of architects as to plans; responsibility of architects in decorative matters; sculpture and architecture; painting and architecture; the client's right to service, as to drawings; ownership of same, specifications and details, as to supervision, etc.; mechanical engineering in architecture, and the architect's responsibility therefor; modern steel construction; fire-proofing of building to date.

The above mentioned subjects will be presented by the most eminent architects of the world.

The World's Congress Auxiliary takes pleasure in extending to you a cordial invitation to attend this congress, and begs the favor of an early acceptance.

Address all communications to Robert Craik McLean, secretary, 19 Tribune building, Chicago.

Very truly yours,

D. H. BURNHAM, Chairman.

It is essential that the members of the architectural societies organize under the direction of their presidents, who are members of the advisory council of the committee, and as far as possible see that each society and locality is fully represented. While many architects may not receive the committee's invitation, as the names of those belonging to architectural societies alone are obtainable, all architects of accredited standing will be welcome.

DIRECT METHODS IN ARCHITECTURAL PERSPECTIVE.

BY CHARLES E. ILLSLEY, A.M., C.E., ARCHITECT.

CHAPTER III—ISOMETRIC DRAWING.—Continued.

THE remaining illustrations in this chapter display the varied applicability of isometric drawing for constructive details. As was remarked on a previous page, these cuts were not made for publication, but are copies of actual working details employed in the erection of buildings. In general it is believed that they explain themselves.

Fig. 60 shows how beams hang in a wrought-iron stirrup from a fitch plate girder, and are tied together by a wrought-iron strap across the girder.

Figs. 61 to 64 inclusive show piers and cast-iron stools, pintles, etc., for a steam laundry, where it was desired that the foot of the posts should stand high enough above the floor to escape water, and where in the upper story the use of wooden bracing for stiffness was prohibited.

Figs. 65 and 66 show a new joint for the lower members of the diagonal rafters of a large "scissors truss" of a church roof. Fig. 67

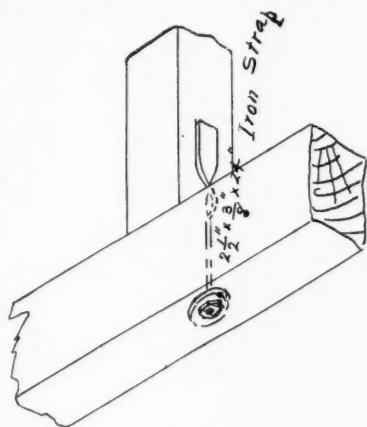


FIG. 59.

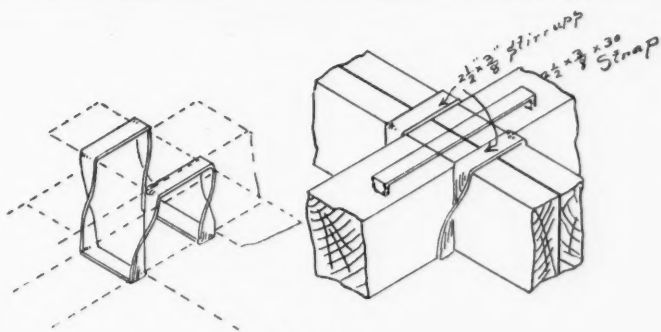


FIG. 60.

shows the same plan and elevation. Fig. 68 gives details for the transverse trusses of the same roof, shown in section by Fig. 69. Fig. 70 shows an old gallery in an old church, with a railing of gas pipe, to be curtailed. Suspending rods from the roof run through every alternate standard of the railing.

CHAPTER IV.

THE ISOMETRIC CIRCLE.

52. A correct isometric circle may be drawn in any isometric square by the general method already described of first drawing the true circle with its inclosing square and transferring all points of this circle to its isometric projection by rectangular measurements, or what is geometrically known as abscissæ and ordinates along rectangular axes. In practice this is never done, since it is laborious and there is a short method of obtaining a four center curve of circular arcs which answers every necessary purpose.

53. Fig. 71 represents a horizontal isometric square, such as the top of a cube. As already explained, the four sides are equal and the angles at B and D are of one hundred and twenty degrees, while those at A and C are of sixty degrees. Hence the line B D, which bisects the angles at B and D, also bisects the isometric square, forming two equilateral triangles, A B D and B D C.

From B and D draw perpendiculars B a, B b, D c, D e, to the opposite sides. A line dropped from the vertex of an equilateral triangle perpendicular to its base bisects the base: hence a, b, c, e, are the middle points of their respective sides, and are therefore the points in which the inscribed circle will be tangent to these sides. Since B a, B b, are perpendicular to A D, C D, at their middle, B is the center and B a, B b, are radii of the required circular arc between a and b. In like manner D is the center for the corresponding arc c e. These radii intersect at f and g', which therefore become centers for circular arcs between a and c, and between b and e, connecting the arcs previously drawn.

54. The compound curve thus obtained is accurately correct at the four tangent points a, b, c and e, and varies but slightly from the true isometric circle elsewhere. Hence we have our

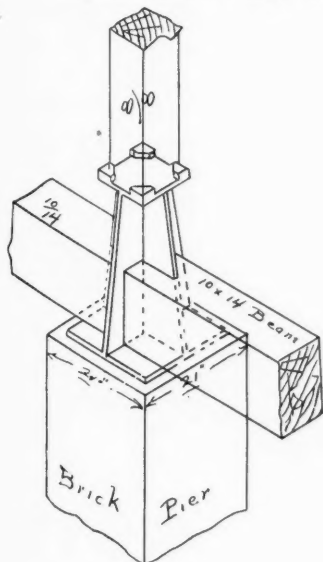


FIG. 61.

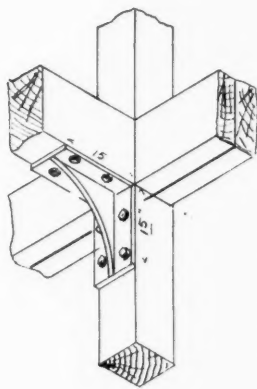


FIG. 62.

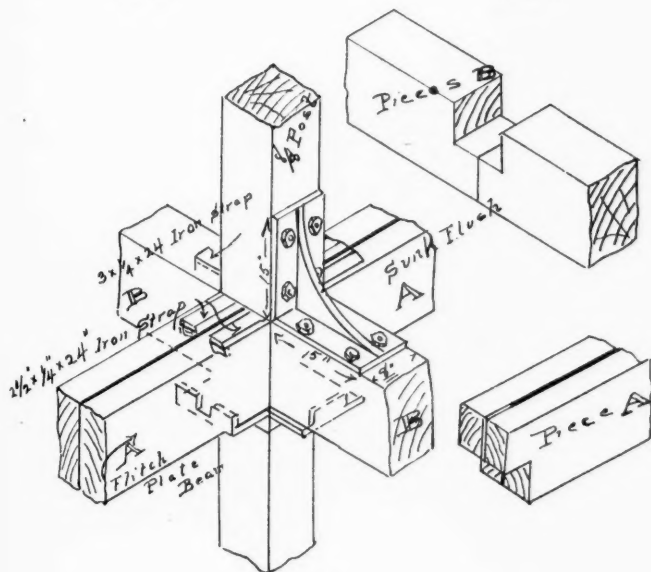


FIG. 63.

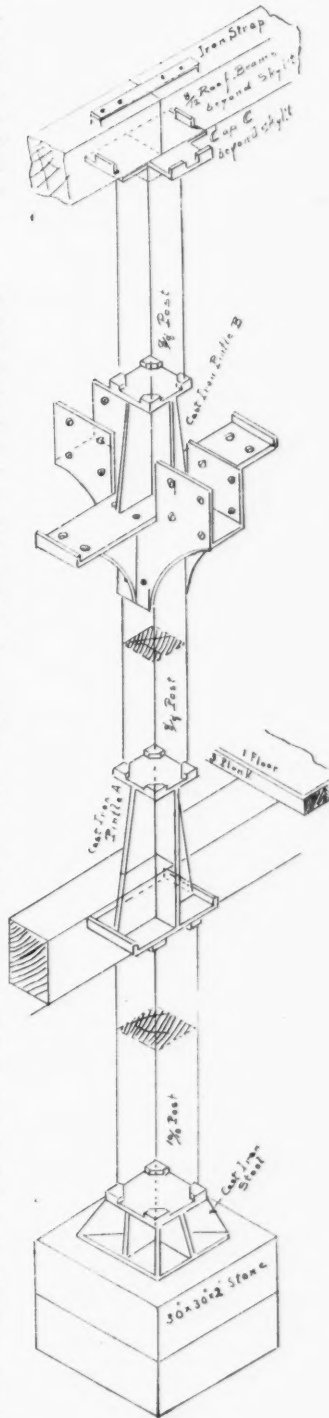


FIG. 64.

RULE FOR DRAWING THE ISOMETRIC CIRCLE.

Construct the isometric circumscribing square, Fig. 71, and from the corners B and D of the obtuse angles draw lines B a, B to B c, D e, to the centers of the opposite sides. The intersections of these lines, f and g, are centers for the circular arcs a c and b e, while B and D are centers for the other arcs which close the curve.

Fig. 72 shows the application of this rule to all the sides of the isometric square.

55. In large drawings it may be inconvenient to construct the full isometric square, and often a part only of the isometric circle is required. It will be observed in Fig. 72 that a line e m, from the middle of B C, parallel with B E, bisects B G. The center G,

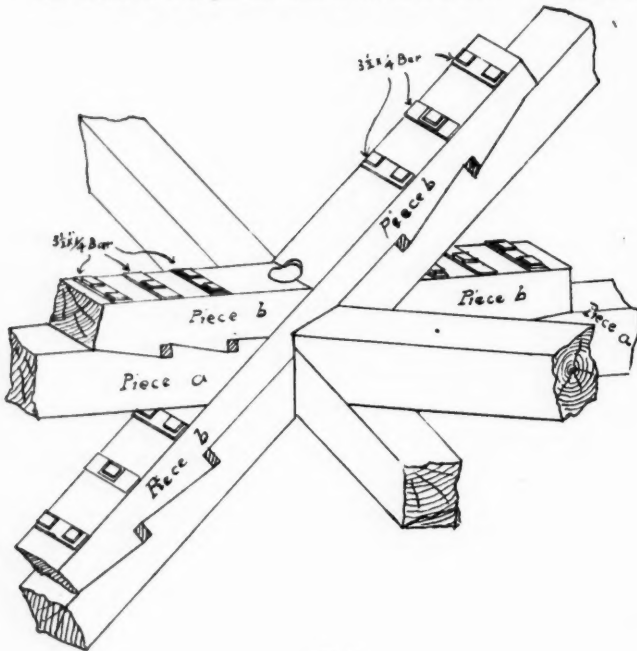


FIG. 65.

for the arc e h, may thus be found by drawing the indefinite line B G at an angle of sixty degrees with B E, and laying off m G equal to B m, the point m being the intersection with B G of the line e m, which represents the vertical from e, the middle of the span.

Fig. 73 gives an application of this method to the isometric drawing of the curved member of a roof truss, where only the quarter circle B C is to be shown. Draw A E, at sixty degrees

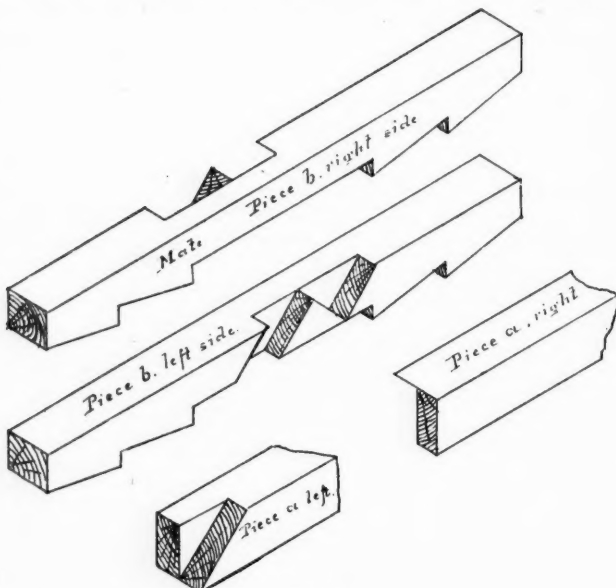


FIG. 66.

with A C. From B, the center of the span, drop the vertical B D. Lay off D E equal to A D. From E as a center describe the circular arc B C.

56. Figures 74 and 75 show reversed views of the pulpit arch of a church and the roof supports over the organ gallery. In Fig.

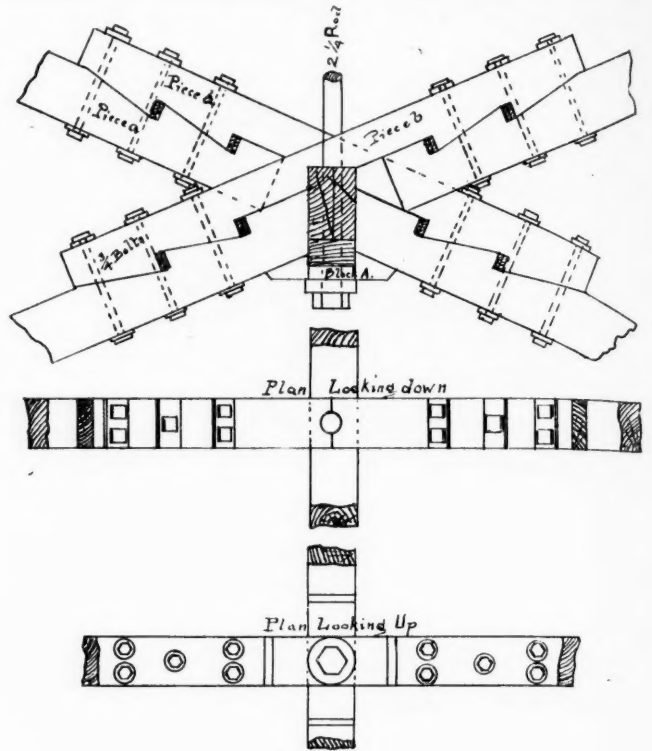


FIG. 67.

74 the half-circle is shown, and only so much of the isometric square has been drawn as was necessary to find the two centers a and d. The line A a bisects the sixty-degree angle B A C.

To find the center b for the arc starting at c, draw a b at sixty degrees with A B, and lay off a b to scale equal to the thickness of the pulpit wall.

In Fig. 76 no center for the isometric arc was within reach. The curve a e f g' was obtained by rectangular measurements out, as a b, a c, a d (abscissæ) and heights b e, c f, and d g (ordinates) taken from the scale elevation of the truss.

(To be continued.)

A TALK ON ARCHITECTURE AT THE WORLD'S COLUMBIAN EXPOSITION.

BEFORE THE LAKE FOREST ART INSTITUTE, MARCH, 1893.

BY W. L. B. JENNEY, ARCHITECT.

THE earliest World's Fair was in London in 1851, which demonstrated conclusively that the bringing together of the industries and arts of the several nations in competitive exhibit was not only interesting but of practical benefit to all, teaching many a lesson not to be learned otherwise. These World's Exhibitions have become the rule.

Since then, we have had those of Dublin, 1852; New York, 1853; Paris, 1855; London, 1862; Paris, 1867; Vienna, 1873; Philadelphia, 1876; Paris, 1878; Sydney, 1879; Melbourne, 1880; Paris, 1889; all undoubtedly of general benefit, though in most cases the cost exceeded the receipts.

The one at Vienna, although intended to be finer than any precedent, was not well patronized by visitors. The daily attendance averaged only 18,800, due, it is thought, largely to the very high prices charged for accommodations and for everything a visitor might require, both without and within the grounds.

Paris, in 1889, was eminently a financial success, the receipts exceeding the expenditures by \$1,600,000, and was of incalculable benefit to the city.

We have reason to expect great things for Chicago, for we have a finer and more extended site, a greater area of fine building, a much larger expenditure for the installment and for the entertainment of visitors, and in general more liberal accommodations than were ever offered before.

ARCHITECTURE AT THE EXPOSITION.

In the early beginning Mr. Root had been appointed supervising architect, Mr. Burnham chief of construction, and Olmstead & Co. landscape architects.

A general layout of grounds and buildings was prepared and then came the very important question, "How shall the architects for the Fair buildings be chosen?" The common way and the one that to the minds of the uninitiated would seem to be eminently fair and advantageous, is a general competition to which the architects of the United States should be invited, the building committee to be judge and jury. In practice this has proved to be the very worst method of choosing an architect that has ever

been invented. Certainly this has been universally true in this country. The cost of competitive designs is so great that architects in large and successful practice will not chip into the lottery, where the prizes are so few and the blanks so many, the thousand or more dollars that a set of competitive drawings must cost. It is, from a financial point, worse than the Louisiana lottery and not much better morally. An option on the board of trade is a far better investment.

From the side of the building committee, the result is no more promising. They will get few if any designs, unless they promise to pay for them, from the men to whom they would be willing to trust the work, and it is safe to say that not even one design will be presented that can be executed without very material alterations. Such must of necessity be the case, for in a general competition there cannot be that free interchange of ideas between architect and directors that is so very essential to the production of anything the directors will accept. Competitions invariably result in a disagreeable, vexatious wrangle, unprofitable to all concerned, ending, after much waste of time and money, just where it began, with the momentous question, "Who shall be appointed architect?" still unanswered.

Fortunately the Exposition Committee on Buildings and Grounds were men of experience and soon agreed upon the very best method of choosing their architects, which was to select the ten men they thought would serve them best, five to be chosen from among the Chicago architects and five elsewhere in the United States; these ten architects to form a committee of the whole and each to be assigned a special building. The results have proved the wisdom of the method. Not by any means can it be stated that each of the ten architects could not easily have been replaced by others who would have done quite as well or even better, but it can be asserted and proved that the method led to very satisfactory results, and that the Committee on Buildings and Grounds have paid the highest compliments to the professions of architecture, sculpture and painting, and have given them opportunities that they never enjoyed before in this country. Too much can scarcely be said in praise of the actions of this committee. They have been dignified, appreciative, liberal and eminently practical.

As soon as convenient after their appointments, the ten architects, the landscape architects, and Mr. St. Gaudens to represent the sculptors, met in Chicago. The general problems of the design of the grounds and the location and approximate size of the several buildings were discussed. There has been but little departure from the general plan then agreed upon. Then the style of the architecture, the question of domes, general height of the side walls, etc., was all discussed and an agreement reached that all should follow as far as the special requirements of the different buildings would admit. About a week was spent on this work and then the committee adjourned to meet again as soon as the architects could prepare the preliminary studies.

Again they met and each in his turn explained his design, a general discussion ensued, criticisms were freely given, but all in the pleasantest and most friendly way, and when that meeting adjourned, each of the ten architects felt that he had profited by the advice of the other nine and that his special building would be better therefor.

There have been other meetings from time to time, held both in Chicago and New York, to decide upon such general questions as use of sculpture and the appointment of sculptors, the coloring, the painted decorations and the selections of painters. In all these meetings and in all these discussions, only the pleasantest feelings have obtained and not in a single instance has anything occurred to mar that spirit of good fellowship that has existed from the first.

Although each architect is responsible to a large degree for his individual building, the general effect of the whole, the grounds, the buildings and the great features of their adornments, is the work of the joint committee of architects, landscape architects and sculptors. In all this work, both general and special, Mr. Burnham, Director of the Works, gave his willing cooperation.

For the first time in America have the architects had the assistance of the sculptors to embellish their buildings. Heretofore, except in some rare instances, the architects have not dared to count upon even a bas relief, or two or three groups, feeling that they would probably be omitted, or worse, given to some cheap man, but at the Fair buildings the best sculptors in America have lent their assistance. This sculpture is where the architects designed it to be placed. It is not only beautiful in itself, but it is designed in the true spirit of the architecture it embellishes, and becomes a part thereof. For example, the two groups by Lorado Taft on either side of the main entrance to the Horticultural building, "The Awakening" and "The Sleep of the Flowers," are as much a part of that entrance pavilion as the columns or the arch moldings.

One word on the construction of the Fair buildings. They are to last but a single summer, but to be ready for that summer they must stand the severe trial of a Chicago winter. They must be handsome, elegant, effective and richly decorated in holiday attire, and yet must be comparatively cheap and quickly constructed. To this end, a rough frame construction on pile or wooden crib foundations, as the case required, and then the entire exterior walls covered with staff. All the columns, moldings and the sculpture made of this same material.

Staff is of foreign invention. It has been used in Italy for centuries. The best staff for use in Chicago in such buildings is composed of one part best Portland cement and five parts

plaster of Paris, to which enough long hemp fiber is added to bind it thoroughly together. This is cast in molds, or plastered onto laths, the same as ordinary plaster is put onto the interior of our houses. In cold weather it must all be cast, even the plain surfaces, and when thoroughly dry it is nailed onto the building and the joints and nail holes pointed with same material. Then it must have a coat or two of linseed oil or good oil paint to protect it from the weather. If of good material and well made and protected by paint, it should last many years; by omitting the plaster and using only good Portland cement mortar, it can be made as enduring as our cement sidewalks, and can be used for permanent buildings.

The lessons taught by the architecture of the World's Fair are valuable and will improve the architecture of Chicago. They may be briefly enumerated as dignity—repose—adaptability to the requirements. A style once adopted must be preserved. A careful study of precedents. Regard for proportions as a whole and in the several parts and in details. More attention to the best adaptations of the classic to modern requirements or what is usually termed the Renaissance of the different schools—French, Italian, Spanish, etc., and above all, it can teach the valuable lesson that good work requires the most serious and careful study, even of those who have had a thorough preliminary training and long and successful practice. The architects must give the most careful supervision to the work of their office, however able their assistants. In this connection, the example from the United States government calls attention in a striking manner to the wrong policy of calling upon a supervising architect employed at a comparatively small salary by the Treasury Department, to furnish designs and attend to the enormous amount of office work for all the numerous great and important public buildings that this country has yearly under contract; that the results are decidedly inferior to what could be obtained by a proper selection from the architects of the country, is being repeatedly brought to the attention of congress. Again in this connection we might cite as another example of how not to do it, the Chicago postoffice.

The World's Columbian Exposition is a grand object lesson in its architecture as well as in its exhibits. It is now generally admitted that object lessons, in the broadest and best sense, are the most impressive, the most efficient, the quickest and the easiest learned.

Chicago should be the first to profit by these teachings, and because a greater proportion of the inhabitants of Chicago, men, women and children, can see the Exposition than of other cities, Chicago should reap the greatest profit. The thought, the labor and the money that has expended has been well spent and will bring forth large and lasting returns.

The talk was illustrated by about sixty lantern slides, with explanations and remarks.

HEATING AND VENTILATION OF RESIDENCES.*

BY JAMES R. WILLETT.

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YOUNG GENTLEMEN,—I have been invited to speak to you on the subject of heating and ventilation, in its practical applications. The theory of the subject, I presume you have been, or will be, instructed upon by others. My purpose is to show you the way in which a person engaged in such business may prepare designs for execution.

Many years ago, long before you young gentlemen were born, a young architect had prepared designs for a residence, and had acquitted himself to his entire satisfaction; and, as he thought, to the satisfaction of the owner. One day, when the building was nearly completed, the owner asked the architect, "What size furnace would you use in the house?" For in that day, heating by hot water and steam, at least as applied to residences, was uncommon. The young architect could not answer the question, for he knew nothing about it. However, he said he would consider the matter, and in that way postponed the decision.

How was he to ascertain the proper size for the furnace? He could find books on the subject of heating and ventilation, but they did not enable him to arrive at a prompt and definite answer to the question asked.

The young architect at last found that the only way to acquire knowledge on the subject was to go to the contractors who were engaged in putting up furnaces. After acquiring all the information he could from them, comparing their statements, etc., he arrived at a conclusion which he gave to the owner in, perhaps, a somewhat oracular manner.

The statements made by the furnace men did not, in many instances, agree. Each man was, of course, interested in the sale of some particular furnace. They possessed a large amount of information derived from actual work, and they carried on the work largely by their "judgment." The only rule which appeared to be general was: They would take the volume of the building, and they knew, from previous experience, about such a size furnace would be sufficient for such a building. The experience they had acquired was very valuable, but it was not digested and arranged so that general rules could be deduced and applied to other buildings.

We propose to give "office" rules—that is, such rules as can be promptly and readily applied in making out designs and specifications for such work. It is to be understood that these rules are

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approximate only. But they are sufficiently correct for practice, as experience has shown. Every practitioner has such rules, must have such rules, and every practitioner who has written on the subject has given such rules. The endeavor has been made to give rules so that the field for judgment will be limited, and to prevent grievous errors from being made; but judgment in the use of these rules is required. No rules can be made on any subject that do not require the use of the judgment in their application.

There are many methods or systems of heating and ventilation. There is no one that is, under any and all circumstances, superior to every other. This lecture will be confined to the heating and ventilation of ordinary residences in a simple manner. There are several reasons for this; one is that you must creep before you walk. If a young architect will master the lower walks of a subject, he will be afterward much better fitted to comprehend the higher branches of it. Besides the time allotted to this lecture will not admit of an extensive treatment.

Any residence which has a heating apparatus designed to be run in the best manner, and requiring thorough and constant attention, will be more or less of a failure. The boilers in an ordinary residence are usually run by the owner of the house, by a servant girl, or at best by a coachman whose time and attention is mostly occupied with other duties, and who looks upon the necessity of attending to the heating apparatus as an infliction and a burden; therefore, it is essential that in designing a heating apparatus for a residence, it shall be capable of working satisfactorily under some amount of neglect and misuse. This neglect is contemplated and allowed for in the statements hereinafter made.

The method of heating a building should be decided upon before the plans for the building are finished, as the method of heating affects, or should affect, both the plans and construction of the building.

VENTILATION.

To make a proper design for ventilation, it is necessary to know or to assume:

The number of persons who are to inhabit the house.

The fresh air that should be allowed to each person. This is put down by some authors as high as 2,000 cubic feet per person per hour, and even higher.

The quantity of air necessary to provide for the vitiation of the air by gas or other lights.

How can anyone tell what number of persons will occupy a residence and for how many hours per day? How often will the number of persons change? How many lights will be kept burning, and for how many hours will they burn? How much air will leak into the house or be forced in by the winds outside?

All of these questions are somewhat in the nature of conundrums. In the same residence the data will vary from day to day.

We must assume a certain data, depending upon the style of the house, the class of people who occupy it, etc.

It may be assumed that there will be two persons occupying each bedroom; and the number of bedrooms multiplied by 2 may be taken as the total number of persons to be provided for.

As to the lighting, that is even more uncertain than the number of persons in the house. It may be assumed as one burner per person. The number of hours that the lights are burning will probably not exceed six hours out of the twenty-four. Indeed, all the lights will not probably burn that long, and four hours out of the twenty-four may be sufficient, but we will consider them as burning six hours out of the twenty-four.

The air required for the vitiation by gas lights is given by Schumann as 1,800 cubic feet per hour for each cubic foot of gas burned. As each burner may be taken to burn four cubic feet of gas per hour, then each light would require 7,200 cubic feet per hour. This is, however, for but six hours out of the twenty-four. If then it be assumed that a burner will burn six hours, and distribute it over the twenty-four hours, it will give 1,800 cubic feet per hour. Adding 2,000 cubic feet, the quantity required for the use of each person, to 1,800 cubic feet, the quantity required per person for the consumption of one burner of gas, gives a total of 3,800 cubic feet of fresh air required for personal use, together with gas consumption, per person, per hour.

If we assume the velocity of the air entering the fresh-air duct at six feet per second, and it is usually as much as that, if the rules hereinafter given are complied with; then to give 3,800 cubic feet of air per person per hour will require a cross sectional area in the fresh-air duct of 25.4 square inches per person, or say 25 square inches per person.

The question of the leakage of the air into the building is a very considerable one. The more leakage there is, the less area will be required in the fresh-air duct (and vice versa to some extent). In the very best built houses the leakage is always large. There is no way of ascertaining its amount, but it is thought fair to assume that not less than one-fifth the volume of air that will be required in the house is furnished by leakage; and when a strong wind is prevailing it may be much more. It is true that there is leakage out of the house as well as into it; but the leakage out of the house is less than into it, because the outward leakage must pass through two walls instead of one and because the heating of the house draws air to it. It is thought that the difference will amount to one-fifth, as above stated.

If we take then one-fifth of the fresh air as furnished by leakage it will reduce the area of the fresh-air duct to twenty square inches per person. It is not advisable to make the area of fresh-air duct smaller than this and it is much better to make it larger, provided always that the radiator, or warming, surface for heating the fresh

air, is increased in the same ratio, for if the incoming air is cold it will be shut off.

The foregoing can be condensed to—

Area of fresh-air inlet in square inches, $= 40 \left\{ \begin{array}{l} \text{Number of bedrooms in residence.} \end{array} \right.$

On a windy and cold day, it may be found that it is impracticable to keep the house warm with the fresh-air duct fully open. Or, even if it could be kept open, the consumption of coal would be such that the owner would not incur the necessary expense.

Here it may be remarked, that the question as to how the owner is likely to act under certain circumstances is one that the practicing architect should take into consideration.

If the fresh-air inlet is large, and owing thereto, the house either becomes cold, or the amount of coal used is, in the judgment of the owner, excessive, it is practically certain that he will shut the fresh-air inlet up; probably shut it up altogether, and thereby deprive the house of all fresh air except what it may obtain through leakage. Long and continuous experience has shown this to be the case. Whereas, if there is a means of closing the fresh-air inlet to some extent, but not altogether, the owner is likely to so close it. This will, of course, decrease the supply of air, but it is better to decrease the supply of air than to altogether stop it.

It is well, therefore, to provide a damper in the fresh-air inlet. This damper, however, should not close the inlet wholly; say one-third of the damper should be cut off.

If the damper is thus arranged and the proportions given in the rules observed, the supply of fresh air will still be equal to 1,200 cubic feet per person per hour. Indeed, it will be more, since the leakage will not be diminished, but rather increased. Besides, when the wind is blowing hard the velocity in the fresh-air duct will be increased.

The volume of air in cubic feet that will pass through a duct of any cross sectional area, with air moving at any velocity, can be found by recollecting that a duct of 1 inch cross sectional area, with air moving at a velocity of 1 foot per second, will pass 25 cubic feet of air per hour. If, therefore, 25 be multiplied by the cross sectional area of any duct, in square inches, and also by the velocity in feet per second, the product will be the quantity of air in cubic feet per hour that said duct will pass.

Example: What volume of air moving at 8 feet per second will pass through a duct having a sectional area of 113 square inches, in one hour, $25 \times 8 \times 113 = 22,600$ cubic feet.

The opening of the fresh-air inlet should be upon the side of the house against which the prevailing cold winds blow. (This means, in the vicinity of Chicago, first the north side and next the west side.) The openings should not be exposed to the direct force of the wind. If there are no buildings, fences or other obstructions close by to prevent the wind from striking the opening directly, then some shield should be erected to do so. There should be but one opening to the fresh-air inlet; but if there are two boilers or furnaces to the house, then the opening to the fresh-air inlet to each should be on the same side of the house.

If there be fresh-air inlets on the different sides of the house, it is not at all unlikely that the fresh air will at times be driven in one inlet through the radiators or furnace, through the house and out of the other supposed fresh-air inlet.

The fresh-air duct should not be taken under the basement floor, where it is liable to fill up from flooding of sewers, dirt, dead rats and other filth; but it should be kept above the ground, brought along the basement ceiling until it reaches the proper point and then, but not till then (turning down if necessary), enter the bottom of the indirect radiator casing, or furnace.

All incoming fresh air must be heated by indirect radiator, or by the furnace.

The hot-air flues to rooms will be spoken of when speaking of indirect radiation hereafter.

The outlet flues through which air passes out of a room, and out of the building, should be of brick, similar to smoke flues, though they are sometimes made of tin. Every room should have such a flue. The opening from a room into outlet flue should be close to the floor, in, or just above, the baseboard. This opening should have a register. This register should be rather small than large, for if large outlet registers are used some of them are apt to become air inlets instead of air outlets—that is, some are apt to "draw downward," as it is termed, instead of upward.

A general rule for such an outlet register may be taken as follows:

For first-story rooms: Divide the volume of the room in cubic feet by 30 and the quotient will be the gross area of the outlet register in square inches.

For second-story rooms: Divide by 40.

For third-story rooms: Divide by 50.

The outlet register should not be much greater than called for by the above rule unless the fresh-air duct is enlarged.

The sum of the gross area of the outlet flues should not exceed $1\frac{3}{4}$ the area of fresh-air inlet duct. If it does, then either they should be reduced or the fresh-air inlet duct enlarged. The latter is best.

The fresh-air entrance to inlet duct should be covered with wire netting to keep out dust, etc., and this entrance should have at least twice the area of the inlet duct with which it connects, as the wire netting diminishes the supply of air. If this area cannot be had it is better to leave off the netting.

The rules given are based on fresh heated air being admitted to the house through an indirect radiator. If indirect radiation is

not put in, then the direct radiation should be increased by one-half (or more) of the indirect radiation.

HEATING.

Residences are heated in three different ways:
By hot-air furnaces;
By steam apparatus;
By hot-water apparatus.

How shall a residence be heated? This is a question which is largely determined by the owner; usually on the score of expense. The cost of the heating apparatus may be taken in the following order: The furnace is the cheapest, the steam above that, and the hot-water apparatus usually costing the most.

The buildings that are usually planned by an architect are not nowadays often heated by furnace. Nevertheless, most of the residences throughout the country that have any heating apparatus, are heated by furnace, and the young architect should know something about them.

In hot-water heating the air is often exposed to a temperature of but 100 degrees Fahr., and is not likely to be over 180 degrees. The temperature of the water is practically never above 212 degrees, and usually not more than 150 degrees.

In steam heating the air comes in contact with a surface which is not usually below 212 degrees Fahr., while it is often much higher, the air being exposed to a temperature which is seldom less than 200 degrees and often as high as 300 degrees.

In hot-air furnace heating the method of heating is altogether what is termed the indirect system of heating. The incoming fresh air comes in contact with a surface highly heated. It is liable to be exposed to a surface which may have a temperature as high as 600 degrees, and which often has a temperature of 400 degrees.

The air which we breathe is full of particles of dust. Now, when this air comes in contact with a heated surface, such as it may do in a hot-air furnace, the dust is burned; and the air perhaps otherwise injured and rendered unfit for breathing. In heating by steam, the same thing may occur, but in a very much less degree. But in the open system of hot-water heating, it is practically impossible to run the temperature over 200 degrees, and it ordinarily does not exceed 160 degrees. In heating by steam, you cannot make steam at all without bringing the temperature to the boiling point of water (212 degrees) and therefore the temperature of the radiators must be nearly that height. Now, this may be too high for mild weather.

In the "open" method of hot-water heating you cannot raise the temperature above 200 degrees, and therefore you cannot burn the air; and you can regulate the heat to any lower temperature you desire, down to the temperature out of doors. These are the great advantages the hot-water heating system possesses.

In the selection of heating apparatus for residences preference should be given in the following order: First, hot-water; second, steam; third, hot-air furnace.

While the above is true, yet it is better to have a good apparatus of an inferior type than a poor apparatus of a superior type. A residence can be heated and well warmed by any of them, when the apparatus is well designed.

Whatever system may be adopted, the following data are needed for each room to be heated: Volume in cubic feet; exterior wall surface in square feet; exterior windows and exterior doors in square feet.

In measuring exterior wall surface, include the window and the door areas. In measuring windows (and doors) measure between the inside of jambs, that is include width of sash. This is to compensate for leakage of air. The exterior doors are treated as if they were windows in order to compensate for the air leakage during the opening and shutting thereof, etc.

Proceed by finding the value of R for each room according to the following formula:

I=Inside temperature desired Fahrenheit, usually 70 degrees.

E=Exterior temperature.

V=Volume of the room in cubic feet.

W=Exterior wall surface of the room in square feet.

G=Exterior windows and exterior doors in square feet.

R=Standard amount of surface of radiator in square feet.

$$\left(\frac{V}{400} + \frac{W}{10} + \frac{G}{2} \right) \left(\frac{I-E}{I} \right) 0.9 = R$$

In considering the exterior temperature it is not necessary to assume the very lowest that has occurred. Such extreme temperatures usually last but a short time, and any full sized apparatus will bear pushing occasionally. If the lowest temperature is increased by ten degrees the result may be assumed as the exterior temperature. In Chicago the exterior temperature is usually assumed as -10 degrees, although it sometimes has gone down to -20 degrees and even lower.

The portion of the equation, $0.9 \left(\frac{I-E}{I} \right)$ may be reduced to a constant for any particular place. "I" being taken as 70 degrees Fahr., and "E" as 10 degrees higher than the minimum temperature. It is convenient to have these constants, and they are given in Table I hereinafter.

In places where the minimum temperature is above zero, residences are not usually heated by apparatus, but by grates.

For the proper amount of direct radiator surface in square feet necessary to be used in a room, use the following formula:

$Q = R F J$

Where Q=Desired square feet direct radiator surface for a room.

R=Standard surface of radiator in square feet for a room calculated as heretofore given.

F=Factor depending on method of heating, or on particular story, etc.

J=Factor depending on exposure, etc.

If the house is to be heated by indirect radiation there must be hot-air flues provided to reach rooms in upper stories.

The tendency nowadays appears to be in the first story of residences to throw the rooms together by having large openings between themselves and the stair hall without doors. The wall space in the first story is thus reduced to a small amount. It is difficult to find room in it to contain the hot-air flues.

You have flues in the building, very large flues, sometimes more than one of them. It is true they are not called flues, but nevertheless they are flues, and, unless you need to throw a small amount of very hot air into a room, you can do away with the small hot-air flues and use the large flues already provided. These large flues are called stair halls. They have several advantages over the small flues. They can deliver a large volume of air at a velocity so slow as to be inappreciable. The air need not be heated up above a low temperature, say 80 or 90 degrees Fahr. In rooms where there are openings without doors, the air can pass. Where there are doors the air can enter by means of a low transom over the door.

One of the difficulties of heating by the indirect system of small flues is the fact that the large flue, known as the stair hall, is frequently working at cross purposes with the small hot-air flues. On a windy day it is certainly difficult to thoroughly heat, by the indirect system alone, that side of the house exposed to a gale. The exclusive use of the indirect system is not necessary for ordinary residences. The best result is obtained by a combination. With direct radiators for the warming of the room and with indirect radiators for the warming of the necessary incoming fresh air.

By direct radiation is meant that radiators are to be placed in the room which is to be heated. By indirect radiation, that radiators heat air and then this heated air is passed into the room.

Usually indirect radiators are placed in the basement just below the ceiling. This brings the bottom of the radiator down low compared with the boiler. Now the higher the radiators are above the boiler the better.

A radiator has been introduced in late years which is termed the direct-indirect. This radiator, to all appearances, is a direct radiator, but the sides are partially closed in and a fresh-air duct is brought below it from which fresh air is received, and passed up through the radiator. This direct-indirect radiator can be placed on (and above) the first floor, and is well above the boiler which is usually placed in the basement, therefore it works better than if lower down. The opening in the floor through which the air passes up is covered by the radiator. We consider this radiator preferable to the old (or basement) indirect radiator.

The indirect system of radiation permits of ventilation, at least requires the circulation of air both in and out of a room, whereas the direct system causes the air already in the room to circulate in it, and does not require the introduction of air from outside of the room. Each system has its own benefits and its disadvantages. The indirect system makes it difficult at times to heat some of the rooms which are exposed to prevailing winds, and has been known to act in a reverse manner, driving the air in the upcast flue, or what is intended for such, downward. Furthermore, the quantity of heat necessary to warm the room depends upon the amount of air introduced at the proper temperature. Now, the quantity of air required for ventilation and that required to carry the necessary amount of heat, are not usually similar. The requirements of heating and of ventilating usually clash and one or the other must be, to a more or less degree, sacrificed.

The indirect radiators should not have any valves upon them. If any heat at all is needed they should be in operation; besides, as they are exposed to the incoming fresh cold air, they are very liable to freeze up if the flow of steam or hot water is stopped.

In the direct system, the radiators being in the room to be heated, the question of the quantity of air introduced, so far as the warming of the room is concerned, nearly disappears, and a direct radiation can be proportioned to the necessary amount required to warm the room and to warm it only, while the ventilating of it can be treated separately and apart.

In large, expensive buildings there are sometimes built hot-air flues to each room, and if the building is to be heated solely by indirect radiation this is imperative; but if the rooms are already heated by direct radiation it is only necessary to heat the incoming fresh air that is required for ventilation, and this brings the amount of indirect radiation required to a small amount compared with the amount of air required when heated exclusively by indirect radiation; besides it is very difficult to obtain sufficient room within the walls to carry up hot-air flues to the rooms in the upper stories, as the upper story rooms are usually smaller and more numerous than those in the first story.

The best place for a direct radiator is under the window sills. Now this requires a low radiator, while the tendency is nowadays to lower window sills. We would recommend that direct radiators not exceeding twenty-three or twenty-four inches high from the floor be used. In designing a house the window sills should be kept not less than twenty-six inches from the floor. With low radiators they usually need to be long in order to make the requisite heating surface; this should also be looked after. It is well to keep this matter in mind in designing a building, and make your windows either wide or twin or triple windows, which afford room for the requisite length of radiators. It is not desirable usually to

extend the radiators beyond the window, at least the ladies particularly object to it. If you cannot place the direct radiators under the window sills, then place them against exterior wall or as near as is practicable. If you heat the exposed sides of a room you will heat the whole of it.

Considerable trouble sometimes arises from the objections of the owners, and especially their wives, in placing the radiators, and sometimes practically objecting to radiators at all, or else putting them in such places as will not allow sufficient size of radiator to be put in. The difficulty is increased by the fact that they want the radiators low down. Less objection is usually made to a low radiator than to a high one; but a low radiator requires a greater length than a high one for the same amount of radiator surface.

Some owners object to giving any sufficient space for a heating apparatus, and architects do not usually make proper and sufficient provision therefor.

The direct-indirect radiators should be the highest made (45 inches) so as to give ample radiator surface to heat the incoming fresh air and to take up as little floor space as is possible. Do not place them under windows, but in an unoccupied place in stair hall.

It is usually best to consider the first and second story stair halls as one first-story room, and treat it accordingly. Where the second-story hall is large, or much exposed, then a minor portion of the radiation may be put in second story, otherwise put it all in first story.

Some years ago the manufacturers were very apt to overrate the surface in the radiators. This is not so much the case now, except with radiators which have what is termed extended surfaces, that is, solid projections on radiators. Now, while it may be admitted that these projections are of some value, they are not nearly so valuable as is claimed for them. It is not known how valuable they are, but they are of no very great value and the only safe way is not to consider them at all. There is no mystery about measuring a radiator and the surface it contains. You can measure it with a tape line as you can measure any other surface.

Given sizes of pipe refer to their interior diameters. Boiler tubes are given by their exterior diameters. Although strictly speaking they may be a pipe, they are never called so.

There are various plans of boilers, both of wrought and of cast iron. Unless it is a very large residence it is usual to adopt some style of boiler already made and intended for house heating; they are usually of cast iron. There are a number of good ones, and it can only be said that you must use your best judgment in selecting the boiler you wish to adopt.

There should be some relation between the grate area and the surface of boiler exposed to the fire. The heat all comes from the coal which is burned on the grate. If you have your furnace large enough for thorough combustion the heating surface is apt to be sufficient. It is usual to have the heating surface fifteen times the grate area; but the surface in the boiler directly exposed to the fire is much more valuable for heating purposes than the surface of passages which are not exposed to the fire, but only to the smoke.

There is such a thing as getting your boiler too complicated. It is indispensable that all parts of your boiler can be readily gotten at and cleaned out.

Anthracite coal is almost universally used for heating house boilers east of the Mississippi river, and it is assumed that that fuel is to be used.

If the house is a large one, it may be better to use a wrought iron or steel boiler. For residence use, where the dimensions are sufficiently large to require such a boiler, perhaps what is known as the "saddle" and the "fire box" or "locomotive boiler" are the best.

Having ascertained the total square feet of radiation the required square inches of grate area can be taken from Table II hereinafter given.

Each heating apparatus should have an automatic temperature regulator on it. It adds to the comfort and saves fuel. There are various kinds of them, some of them are worked by electricity.

It is well to put a pop safety valve on all boilers, although it is not absolutely necessary with the open method of hot-water heating. A one-inch pop safety valve is usually sufficient.

A steam boiler must have a safety valve and pressure gauge. The boiler grate should give facilities for the removal of clinkers.

In all heating apparatus containing water, provision should be made for emptying same by means of waste cocks which are placed at the lowest point of the apparatus and the water run off to sewer or other suitable place.

The size of the brick smoke flue, that is, its cross sectional area, should be one-fifth of the grate area. None should be less than 12 by 12 inches, and it is better to make them larger, make it 16 by 16 inches if practicable; this will be large enough for an ordinary residence. 12 by 16 inches is usually a fair size.

Some authors say that a flue may be too large. My experience is the other way, even with smoke stacks ten feet square inside.

Some cast-iron boilers have a small smoke outlet. This is a defect. In such cases it is all the more necessary to have a full size brick flue.

(To be continued.)

MOSAIC.

MR. ULYSSES G. ORR, formerly of the firm of Percival & Orr, architects, has opened an office for himself at 31 Builders' Exchange, Buffalo, New York.

UNITED STATES TIMBER TEST WORK.

ALTHOUGH all the leading railroad engineers, architects, professors of engineering and others interested in the timber tests had flooded with hundreds of letters their representatives and senators and the committee on manufacturing, in whose hands the special appropriation for the work was pigeon-holed, neither the committee nor the house paid any attention to this expression of public interest. The senate, however, realized that there was value in the work and sincerity in its indorsers and increased the appropriations for the Forestry Division by \$8,000, that is twenty per cent of the amount asked and considered by those in charge as necessary to continue the work on a proper business basis.

Under the circumstances, the testing will be discontinued until after July, when the new appropriations become available and then proceed at the slow pace which congress has set.

Although the result of the efforts of those who took active interest in securing appropriations for the work were not crowned with that success which they deserved, this is the only proper method of influencing legislation, and those interested in the investigation should not fail to move again when the new congress assembles.

The first compilation of test results is now in the hands of the printer and will probably be issued within six or eight weeks as "Bulletin 8, Timber Physics, Part II." It will contain the results obtained on Longleaf pine and will especially discuss in detail the results of tests and examinations of bled and unbled timber, results which in themselves justify the expenditure by the government of money on such work.

The Forestry Division will exhibit the methods pursued in this work at the World's Fair, which will be of interest, since nowhere in the world has such comprehensive and systematic investigation of timbers been ever devised. The working plans for a similar undertaking by the Prussian government have only just been perfected.

Another exhibit of interest to railroad engineers and those interested in reducing forest waste will be a collection of the most approved types of metal railroad ties.

COST TO SEE THE COLUMBIAN EXPOSITION.

IN answer to a question that is asked by people all over the world, "What will it cost to see the World's Fair?" the Chicago Tribune has carefully compiled figures from which an abstract is taken.

As the Exposition grounds cover 700 acres containing fifty-two exposition and state buildings, besides those of foreign nations, the live stock exhibit and a number of exhibits which are outside, such as Esquimaux and other villages, which may be termed side-shows, twenty-one in number, it is not probable that one person can cover the ground in a day. Supposing he can, the itemized account is as follows:

Admission to Exposition grounds.....	\$.50
" to side-shows.....	5-25
Ride on electric boat.....	25
" elevated railway.....	10
" sliding railway.....	10
" ice railway.....	10
Luncheon.....	50
Round-trip fare from the city by rail or water.....	25
Total.....	\$7.05

This shows the total expense, though the general sightseer would only go through the Exposition buildings for which his 50 cents admission pays. This would make the cost for ten days, including everything, \$18.50.

Following in detail and on the economical basis, the question of cost can safely and satisfactorily be answered for the benefit of the rich and poor alike who anticipate coming to the Fair from any part of the country. As an example, take the man of ordinary means living 500 miles distant. He decides to devote one week to it. At a rate of one fare and a third his railroad ticket for the round trip will stand him \$13.50. He leaves home Sunday evening and arrives in Chicago Monday morning. If he wants a room without meals there will be plenty of comfortable quarters to be had at \$1 a day; with breakfast and dinner or supper \$2 will cover that item. Otherwise, say his meals cost him \$1.50 a day, he stays six days and has expended:

Railroad ticket.....	\$13.50
Sleeping-car berth, each way, \$2.....	4.00
Room.....	6.00
Meals in Chicago.....	9.00
Admission to Exposition grounds.....	3.00
Side-shows, if he takes them all in.....	5.25
Pleasure ride on electric boats, elevated, sliding, and ice railroads.....	55
One trip to and from grounds on lake steamer.....	25
Five trips on street car.....	50
Total.....	\$42.05

The only difference to the men living 800 or 1,000 miles away will be the difference in railroad fare. These are not minimum figures. Liberal allowances are made for respectable as well as comfortable accommodations. Of course the well-to-do merchant and prosperous professional man can spend twice the amount in the same length of time going in for luxuries and higher living, but he cannot see any more of the Fair.

As a matter of information and by way of illustration take a New York man whose bank account is large and put him through a ten days' engagement. It is understood that he will not be satisfied with anything below the best. His railroad tickets and sleeping berths to Chicago and return eat up a \$50 bill. Three meals

each way en route on the dining car will get away with \$6. His hotel accommodations, provided he lives on the American plan, will cost him not less than \$5. His necessary expenditures, therefore, on the supposition that he, too, intends to see everything, will be:

Railroad fare.....	\$40.00
Sleeping-car fare.....	10.00
Hotel bill, ten days.....	50.00
Admission to grounds.....	5.00
Meals on grounds.....	15.00
Side-shows.....	5.25
One ride on each of the pleasure schemes.....	.55
Carriage to and from the grounds, \$3 a day.....	30.00
Total.....	\$155.80

In none of these estimates has any statement been made of the amount of money an extravagant and wealthy person can spend. The object is to show that a man can see the Fair thoroughly on a few dollars or he can spend thousands.

The cost of living in Chicago will be so systematically and well regulated that the visitor need have no concern about not being able to get just what he can afford. There will be plenty of good, comfortable rooms in all parts of the city at the rate of \$1 a day without meals. There will be good rooms with meals at \$2 a day; better rooms without meals at \$1.50 a day, and with meals \$3. These rates will prevail in boarding-houses and in second and third-class hotels. In the first-class hotels one can get accommodated at \$3 a day or \$15 a day. The latter figure will secure a parlor and bedroom, with bath and all the comforts of a luxuriously furnished home. It will not be a hard task to find acceptable accommodations within easy walking distance of the Exposition at rates that no person would feel so niggardly as to take exceptions to, and thus escape the annoyance of traveling back and forth on crowded trains.

People contemplating visiting the Fair are particularly warned against all sorts of schemes for securing rooms in advance, as there will be room for everybody and which can be obtained on arrival without trouble.

DENVER ARCHITECTURAL SKETCH CLUB.

THAT vigorous, talented and healthy sketch club, that of Denver, has had an anniversary, and the secretary sends the following report thereon for the edification of draftsmen:

The fourth annual banquet of the Denver Architectural Sketch Club was held on the evening of Friday, April 14, that day being as near as could be arranged to the anniversary of its foundation on April 17, 1889. Never was such an evening known in the history of the club. Past "annuals" have indeed been pleasant and profitable, with good officers and congenial fellowship; but these very conditions tend to outshine themselves each succeeding year, as shown by this event. The preliminary arrangements, also, were all well considered beforehand, while our blood was yet cool, and our only excitement that of anticipation. Starting out with the unalterable rule, for a working basis, that each member *must* give at least one speech and one song, the president, William Cowe, gave each member some subject a week before, upon which to speak in response to a toast. The members met at the club rooms at 7:30, formed their ranks (which were doubled by the presence of friends), and then made for the banquet room at a neighboring hotel, where things were as they should be. The noble spread was duly honored, and, by 11 o'clock, the tables being cleared, the guests gave those healthy indications of squaring themselves out for a good time which generally succeed a due observance of necessities. Several letters, expressing regret for absence, were read, and among these was one from honorary member R. C. McLean, editor of THE INLAND ARCHITECT; this, being expressed in very humorous terms, was received with great applause, and the writer's regret at his absence was fully shared by those assembled. They voted "Better luck next time."

When these letters were got through (there were very few), the President rose and cost the hotel \$4 worth of hard oil finish which he scattered from the table top in large lumps in hammering for order. The proverbial pin being heard to drop was not in it; we heard the flies on New York moving distinctly. Then, always secure of his audience, our chief began some "remarks" touching upon the history of the club, its early trials and struggles for existence, ending up by pointing to its present high status as calling for unwearied effort not only to sustain but to surpass. This is always a theme of deathless interest, and it was handled in a manner calculated to stir the soul. Vice-President T. A. Green followed with some observations on "Architectural Associations," the clearness and point of which were only equaled by his size and modesty. The secretary, Harvey Pridham, who bears a bad reputation for joking, was punished on this occasion by having to respond to "The Draftsman." The subject is a serious one, and the president thought he had him safe this time, but he managed to break out about twenty times in spite of all precautions. D. R. Huntington then gave a recitation in melodramatic style of the verses entitled "The Architect's Man," which appeared in *Puck*, and which bid fair to become a standing order on such occasions. Business matters took at first an acute and then a humorous turn in a masterly speech by Treasurer J. R. Rainbow, entitled "The Silver Question as Related to Architecture." He clearly showed that to make either President Cleveland or Secretary Carlisle treasurer of the Denver Architectural Sketch Club would at once convert those gentlemen to free silver views, which at present they oppose. (N. B.—The dues are \$1 a month.) "Architectural Illustration and Illustrators" was the subject

allotted to W. Pell Pulis, and the result was not only a great summing up of the merits of the day, but edged around into a fine argument on the virtues of sketch clubs in general, but this one in particular. E. R. Rice handled "Architecture of the West" in a short and pithy manner, full of instructive point. He is the man, you know, who has never been known to waste a word. J. Bevan Phillips convulsed everyone by his remarks on "styles," and startled all his hearers by a series of references to men and things which showed opinions none the less strong because seldom met with. J. G. Link on "The Age We Live In," and Harry Thomas with "Does Architecture Pay?" advanced some views which were of an elevating tendency, and bade both old and young turn their thoughts to better things (architectural, of course), and the members felt wiser and better.

Down along the lines went the president in merciless manner until the demand for the evening was satisfied by a speech from every one, visitor or member. Capital songs were then commenced, and this also was a rule, with scarcely an exception. As, however, these were adapted to no particular subject, but to the object of having a good time, it will be sufficient to chronicle the thanks of the club, outside of its own members, to such friends as Lawrence Phillips, G. M. P. Pridham, Frank Collins, T. McLaren, F. E. Kidder, Henry Read and James Blaikie. The president started out to recite, and has promised us the balance, which he could not remember, at the same occasion next year.

HARVEY R. PRIDHAM, Secretary.

ASSOCIATION NOTES.

SKETCH CLUB OF NEW YORK.

The club held its April meeting in the club rooms on Saturday evening, the 1st. Mr. Parfitt, of Brooklyn, and Mr. Warren R. Briggs, treasurer of the Architectural League, were the guests of the evening. Mr. Parfitt delivered an interesting lecture on the architecture of four European cities, Oxford, Rouen, Nuremberg and Venice. The lecture was illustrated by stereopticon. Mr. Briggs addressed the club on the subject of amalgamation with the league, but at the close of the discussion, it was voted to drop the subject for the present. In the March competition, first mention was awarded Edgar A. Josselyn, and second to Geo. L. Melendy. The meeting closed with an hour's entertainment by a prestidigitateur.

ENGINEERS' AND ARCHITECTS' CLUB OF LOUISVILLE.

The engineers and architects of Louisville have got together and organized a club, with rooms in the Norton building, with the following officers and directors: President, Marshall Morris; vice-president, Harry P. McDonald; secretary, F. W. Mowbray; treasurer, the Peoples' Bank of Kentucky. Directors—Charles Herman, John MacLeod, J. M. Johnson, C. J. Clark, Pierce Butler, E. E. Kuersteiner. The meetings are held in the club rooms on the second Thursday of each month at 2 o'clock. The club rooms are open daily during business hours and engineers and architects visiting Louisville are cordially invited to avail themselves of the privileges of the club rooms.

THE EDINBURGH ARCHITECTURAL ASSOCIATION.

On Saturday afternoon the Edinburgh Architectural Association visited the S. S. C. Library and the M'Ewan Academic Hall. There was a good attendance of members, and the outing was under the presidency of Mr. Robertson, of H. M. Board of Works, president of the society.

Dr. R. Rowand Anderson conducted the association over the M'Ewan Hall. At the outset he explained the main features of the magnificent building. He said he had adopted the form of the Greek theater, believing it to be far the best for an auditorium. There were two galleries, making the building capable of seating 3,000 people. The light is obtained from the dome, a row of round windows above the cornice and a large window at the back of the stage. Ample entrances and exits have been provided, and there is a stair for each gallery, so that the occupants cannot crowd against each other. Round the building runs a handsome passage. There is a great outer wall, and an inner one of arches and pillars, the diameter of the former being 134 feet 6 inches, and the latter 104 feet. The covering of this area, Dr. Anderson said, was the most difficult problem he had to face. It had been solved by Mr. Westland, who had done a very clever piece of work. It was a steel roof, and a very novel and able production. Dr. Anderson then pointed out that it was proposed to build a tower about 280 feet high.

Mr. Westland explained the construction of the roof. The whole structure was carried by 22 ribs corresponding to the divisions of the building. These ribs had to be of peculiarly strong construction from the fact that it was impossible to put in any tie rods. An awkward thing, he explained, in connection with the bracing of the ribs was that at the back of the stage the circle of the building was not completed. This necessitated the whole strain being carried across the stage by means of a very heavy steel girder weighing about 26 tons. Owing to the great expansion—half an inch—which would take place in the steel of the roof, and to guard against any movement of the wall, the girders have been placed on rollers. While this might at first seem an unsafe thing to do, it could be seen that while each rib could expand, the building could never move in the direction of any one of them. As regards the steel, it was of the usual kind, and calculated to bear the roof strain, which would be 5 to 5½ tons to the square inch. The roof

had been erected by building in the center of the building a staging on which they erected an ingenious circular crane. By this means they were enabled to lift the ribs whole. After its erection the roof subsided one-eighth of an inch.

Above the second gallery is a beautifully carved stone cornice. This cornice is 62 feet above the floor of the building, while the rim of the roof is 90 feet in height. In the area of the building accommodation is afforded for graduates, and the seats gradually rise toward the back. The stage, which is topped by a magnificent arch, has been fitted up for an organ and orchestra. The galleries were next visited. From this vantage ground the height and immensity of the building could be more fully appreciated.

CHICAGO ARCHITECTURAL SKETCH CLUB.

The entertainment committee of the Chicago Architectural Sketch Club has issued invitations for the formal opening of the club's new quarters in the Masonic Temple building the evening of May 8. It is designed that the club members at that time entertain their friends, and to this end a slight programme has been prepared, a collation will be served, and in other ways the general attractiveness of club membership will be exhibited to those draftsmen who have not, but should become members of this acknowledged leading sketch club in the United States. The formalities will not extend beyond the reception of guests, both ladies and gentlemen—so that strangers will enjoy the evening as generally as the oldest member.

KANSAS CITY CHAPTER A. I. A.

"Isolated Pier Foundations" was the subject of discussion at the April meeting of the Kansas City Chapter, American Institute of Architects, held on April 3. It had been expected that municipal parks and boulevards would be touched upon, but this subject was left for consideration later in the season. The discussion was opened by W. C. Root, who held that isolated piers were better than continuous wall foundations, as they gave opportunity to put the most strength just where it was needed. According to the old system the foundation was made equally strong at all points, although the strain was manifestly different. The weight of a superstructure could be so exactly calculated and disposed that the point where the greater strain existed in the foundation could be made proportionately stronger and other points weaker. Another point in favor of the pier system was that it brought about a great saving of material. Mr. Root's views were generally indorsed in the animated and interesting discussion which followed. This meeting of the Chapter was purely of an educational and social character. The regular business meeting for hearing reports from the various officers will be held later in the month.

At the annual meeting of Kansas City Chapter, American Institute of Architects, held April 10, the following officers were elected for the year: President, Henry Van Brunt; vice-president, W. F. Hackney; secretary, W. C. Root; treasurer, F. E. Hill; trustees, A. Van Brunt and J. O. Hogg. L. G. Middaugh and L. E. Sheperd were elected to membership.

AMERICAN INSTITUTE OF ARCHITECTS.

A meeting of the executive committee was held in the rooms of the New York Chapter, Welles building, 18 Broadway, on the afternoon of the 10th of April. Present: President Edward H. Kendall; Treasurer Samuel A. Treat, Messrs. George B. Ferry and W. W. Clay, and Secretary Alfred Stone.

As a result of the letter ballot, the following persons were found to be elected Fellows of the American Institute of Architects: John C. Worthington, Philadelphia, Pennsylvania; D. Fred Charlton, Marquette, Michigan; Samuel S. Godley, Cincinnati, Ohio; H. H. Bickford, Elmira, New York; J. Walter Stevens, St. Paul, Minnesota; Wilson Eyre, Jr., Philadelphia, Pennsylvania; J. C. Hornblower, Washington, D. C.

The president and secretary were directed to send a communication to the secretary of the treasury in regard to the operations of the bill in relation to procuring designs for public buildings, and from the reports of those who have interviewed the secretary, it is believed that the provisions of the bill will be carried out in such a manner as to insure a fair trial of its value.

Plans were discussed for the next annual convention, which will be held in Chicago, in conjunction with the International Congress of Architects, in the week beginning July 31, 1893, and the secretary was directed to issue a circular of information as soon as he could learn more in regard to the International Congress of Architects.

ARCHITECTURAL SCHOOL OF THE CHICAGO ART INSTITUTE.

The School of Architecture of the Art Institute is building itself up steadily, though not as rapidly as might have been expected. Perhaps a slow growth is more likely to be substantial. That the school has not gained faster in numbers is due to two causes, both of them creditable rather than discreditable to the school. The architectural division is in a manner submerged and hidden by the great school of academic art with which it is associated. This makes it difficult to publish the architectural school and give it prominence, at the same time it derives great advantages from this association. It is safe to say that there would be scores of students if it were known to parents and students that there was such a school at hand. In the second place the success of the school in one direction checks it in another. The impatience of American youth to get to work earning money is proverbial. Even the short two years' course proves too much for many mem-

bers of the school, and after one year, when they have got the use of the drawing pen and a little rudimentary knowledge they get places in architects' offices and disappear from the school. All the students of last year except three or four have dropped out in this way. No doubt they are much more useful to their employers than wholly untrained boys, but they are from being proper graduates of an architectural school. The number of students now is fifteen or twenty, and they enjoy great advantages for the study not only of design, but of mathematics and construction, under the tuition of Millet, Pond, Shattuck, Otis and other teachers and lecturers. Mr. Otis' course upon ordinary construction is in progress, and Mr. Pond's course upon the theory of design is about to begin, while the practice of drafting, the study of mathematics and the solution of architectural problems goes on all the time.

OUR ILLUSTRATIONS.

Chateau de Josselin, France, J. W. Krause, Del.
Screen, St. Peters, Lorraine, Oscar Tollhurst, Del.
Houses by E. G. W. Dietrich, architect, New York.
The Gesu, Milwaukee, Wisconsin, H. C. Koch & Co., architects.
House for A. Burtis, Buffalo, New York, E. A. Kent, architect.
Kirschbaum Building, Philadelphia, Frank R. Watson, architect.

The Spectatorium for Steele Mackey, Chicago, Jenney & Mundie, architects.

High School at Muskegon, Michigan, Patton & Fisher, architects, Chicago.

Residence for B. T. Skinner, Battle Creek, Michigan, Charles F. Whittlesey, architect, Chicago.

Cathedral of the Sacred Heart and Episcopal Residence, Duluth, Minnesota, C. A. Tenbusch, architect.

Details of the Home of Washington, Mount Vernon, Virginia. Reproduced for the Virginia State Building at the World's Columbian Exposition, Chicago. From measured drawings by Edgerton S. Rogers, architect, Richmond, Virginia. There are shown details of the Main Hall, the Banquet Hall, New York Room, the Illinois Room and the Library.

Design of a window made by George E. Androvette & Co., Chicago, for their exhibit at the World's Fair; the subject, "A Roman Chariot Race," is painted on antique glass, and the border, or frame, is a very elaborate mosaic, interpreting the working of opalescent glass in romaneseque ornament. The possibilities of glass working in a decorative way, both by painting and mosaic treatment, are well developed in this window. The exhibit will be in the northeast corner of gallery of "Manufactures and Liberal Arts Building."

PHOTOGRAPHURE PLATES.

(Issued only to subscribers to the Photographure edition.)

Row of houses at Chicago, Burnham & Root, architects.
M. E. Church, Evanston, Illinois, Burnham & Root, architects.

Residence of George A. Fuller, Chicago, Charles S. Frost, architect.

Residence of James W. Ellsworth, Chicago, Daniel H. Burnham, architect.

Residence of S. Leonard Boyce, Chicago, Francis M. Whitehouse, architect.

Reid Hall, The Academy, Lake Forest University, Pond & Pond, architects, Chicago.

Residence of Henry E. C. Daniels, Evanston, Illinois, Pond & Pond, architects, Chicago.

Grand Central Passenger Station of the Wisconsin Central Lines, Chicago, S. S. Beman, architect.

MOSAICS.

WEHLE & CAMP, architects, have established themselves at 250 Fifth street, Louisville, Kentucky. Mr. T. O. Wehle was for many years a leading practitioner in that city, but through failing health was obliged to resign his practice and travel. He has spent several years in the West and the past two years in Chicago, where in the employ of one of the larger firms he has gained additional experience. Mr. E. M. Camp has passed through ten years of experience in Chicago and is one of the best equipped among Chicago practitioners, and the firm will thus give to Louisville a valuable addition in all lines of architectural practice, their abilities recommending them especially to all kinds of large and important structure work.

EUROPEAN ARCHITECTURE.—Messrs. Olin C. Smith and Allyn A. Packard, of Chicago, have undertaken the publication of a monthly collection of photographs of European architecture, which work has already reached its seventh number. There are ten plates, 9½ by 12, in each number, beautifully printed on bond paper, which is firm and very thin, so that a large number of plates will require but little shelf room. The selection of subjects is made with unusual skill, and shows a practical familiarity with the working requirements of modern architects. The plates before us are largely of Italian decorative detail of the best quality, and would be no less useful to sculptors and decorators than to architects. The footnotes are brief, interesting and useful, particularly in giving the date of execution of the work, when known, and its designer's name. The subscription price is \$10 per annum, in advance.

SYNOPSIS OF BUILDING NEWS.

Architects are invited to furnish for publication in this department monthly or occasional reports of their new work before the letting of contracts. Reports of buildings costing less than \$5,000 are not published.

Chicago, Ill.—Architect Julius H. Huber: For William Drieske, on Clybourn avenue and the river, a series of coal sheds with machinery; cost about \$25,000. For J. L. Cochran, at Edgewater, eleven two-story basement and attic residences; to be of frame construction, with stone basements, hardwood finish, the modern sanitary improvements, laundry tubs, heating, etc. For Charles Steinbrecher, a two-story store and flat building; to be of pressed brick and stone front. For Herman Silverman, on Thirtieth and Dearborn streets, remodeling house into store and flat building; will raise building and put one story underneath; sanitary plumbing, mantels, etc. For A. L. Lawshe, at Converse, Indiana, a two-story basement and attic residence; to be of frame with stone foundation, have sanitary improvements, cypress finish, etc.

Architect J. N. Tilton: Preparing plans for Episcopal church; size 100 by 50 feet; to be erected at Woodlawn avenue and Sixty-fifth street. Also two-story and basement parish house; size 90 by 26 feet; to be of pressed brick and stone trimmings, have interior finish in cypress, stained glass windows, heating apparatus, etc.

Architect J. C. Brompton: For J. L. Cochran, at Edgewater, three two-story basement and attic residences; to be of frame, with stone basements, have hardwood finish, the best of modern improvements, furnaces, etc. Also for M. Willis, on Sheffield avenue, near Addison street, a three-story apartment house; to be of pressed brick and stone front, have hardwood finish, mantels, the best of sanitary plumbing, laundry tubs, heating, etc.; cost \$20,000. Also making drawings for a suburban railway station, to be erected on the West Side.

Architects Hallstrom & Peterson: For Oscar B. Conklin, on Paulina street, near Belleplaine avenue, a two-story frame residence; to have a stone basement, sanitary plumbing, mantels, furnace, etc. For Lizzie H. Walker, at the same location as above, a two-story frame residence; size 22 by 63 feet; to have stone basement, etc.

Architect Henry Sierks: For John Orb, at the corner of Rice and Robey streets, a three-story flat building; size 50 by 75 feet; to be of pressed brick and stone on two fronts, have the sanitary plumbing, hardwood finish, mantels, etc.

Architect Charles S. Frost: For D. A. Kohn, on Michigan avenue, south of Thirty-third street, two three-story and basement residences; size 50 by 50 feet; to be of pressed brick and stone fronts, have hardwood interior finish and mantels, electric light, heating, etc.; cost \$30,000.

Architect John T. W. Jennings made plans for a three-story and attic summer hotel; size 84 by 36 feet; to be erected at Clear Lake, Iowa.

Architects Flanders & Zimmerman made plans for finishing rooms Masonic building, to be occupied by the Masonic fraternity. In all there will be eleven rooms, the principal one being the consistory, which will be provided with balconies and be 160 feet long by 40 wide; a drill hall with stage, size 46 by 97; blue lodge room, 41 by 56; lodge room, 44 by 30; two parlors, 26 by 29; commodory, with balconies, 40 by 55, and red cross room, 42 by 36, dressing rooms, etc. Also made plans for a two-story basement and attic residence; to be of frame with stone basement, have hardwood finish, mantels, etc.; cost \$10,000; to be erected on Vincennes avenue and Forty-seventh street for A. I. Hartshorn.

Architects Dixon & Brookes: Preparing drawings for three-story and attic Masonic temple, to be erected on Forest avenue south of Thirty-first street, for Home lodge; it will be of Bedford stone, terra cotta and mottled pressed brick; have steam heating, electric light, marble, tile and mosaic work, etc.

Architects Ostling Brothers: For Lawrence Brothers, near Humboldt park, a three-story flat building, 21 by 56 feet in size; to be of pressed brick and stone front, have all the sanitary improvements, and cost about \$10,000. For T. P. Carpenter, on North Ashland avenue, a two-story and basement flat building, 27 by 65 feet in size; to have a buff Bedford stone front; cost \$10,000.

Architect Thomas Wing: For G. Phegley, at 1398 Jackson street, a two-story flat building, 24 by 56 feet in size; to have a front of Bedford stone; cost \$8,000.

Architects Newman & Demoney: For G. Carley, Fifty-fifth street and Indiana avenue, a two-story residence, to have a front of pressed brick and stone, all improvements, and cost \$8,000. Also for Encampment Company, a one-story hotel, 79 by 153 feet in size; to be constructed of frame; also office, 50 by 30 feet in size.

Architect H. B. Wheelock: For Hotel Endeavor Company, at Seventy-fifth street and Lake avenue, a three-story addition, to consist of five or six buildings, 40 by 70 feet each; to be of frame. For E. E. Barnard, at Evanston, a two-story frame residence, in the Colonial style of architecture; to have hardwood finish and all improvements, and cost \$10,000.

Architect Thomas Appleton: For B. A. Kipp & Co., at Milwaukee, a three-story factory, 100 by 150 feet in size, and a five-story and basement, 100 by 150 feet; also power house, 50 by 50, etc.; to be of common brick, mill construction; cost \$60,000. Also made drawings for the electric light and pumping station for the South Side Road on Sixty-first street, to consist of engine-room, 52 by 52 feet in size; boiler house, 39 by 35; dynamo and pump room, 52 by 52, etc. Also made drawings for glass manufacturing plant, to be erected at Alexandria, Indiana, for the United Glass Company, to consist of a one-story building 350 by 130 feet in size, very high story; a building, 185 by 70, with L 70 by 85; a batch house, 140 by 60; storehouse, 350 by 40; machineshop and boiler shop, 100 by 80; clay house, 140 by 60, etc.; to be constructed of corrugated iron and frame, with truss roof.

Architect W. R. Clayton: For Phillip May, on Nineteenth and Dearborn streets, a three-story store and flat building, 21 by 67 feet in size; to be of stone front, have all the sanitary improvements, and cost \$10,000. For John Haskins, at Sixty-third and Wright streets, a three-story flat building, 28 by 66 feet in size; to cost \$10,000. Stone front, sanitary improvements, electric light, mantels, laundry tubs, etc.

Architect C. M. Almquist: For T. C. Octagon, on Twenty-eighth street near Cottage Grove avenue, a three-story and basement flat building; to be of pressed brick and stone front, have all the sanitary improvements; cost \$8,000. For C. H. Anderson, on Maplewood avenue between North avenue and Division street, a three-story flat building of pressed brick with stone trimmings, to have bathrooms, closets, mantels, and cost \$6,300. For same owner at same location, a three-story flat building, two flats in length, size 22 by 80 feet, to have a front of pressed brick with stone trimmings; cost \$10,000. For Thomas Hansen, at Lawdale road and Kedzie avenue, three two-story frame houses, 22 by 50 feet in size; to have brick basements, bathrooms, closets, mantels, gas fixtures; cost about \$10,000. For the same owner, at same location, two three-story store and flat buildings, 25 by 82 feet each; to be of frame with brick foundation, have bathrooms, closets, mantels, gas fixtures, and cost \$10,000.

Architect J. W. Ackerman: For J. J. Healey, at Hartland, Illinois, a dairy farm, 130 by 66 feet in size; to be of frame construction with stone piers. Also barn for seventy cows and stalls for twelve horses.

Architect Ira C. Saxe: For Poorbaugh & Fuller, three two-story frame flats, to be erected at Oakwoods. For M. Walker, on Commercial avenue south of Cosgrove street, Ravenswood, two two-story flat buildings, to be of frame with brick basements, have all improvements, and cost \$7,000. For W. Lloyd, on Commercial avenue south of Cosgrove street, four two-story houses, 26 by 46 feet in size; to be of frame with brick basements, have all the sanitary improvements, gas fixtures, mantels, furnaces, laundry tubs, etc. They will be in the Colonial style of architecture, and have eight rooms, bathroom, and reception hall.

Architect Arthur G. Morey: For M. Owen, on Sheridan drive, a handsome two-story basement and attic residence, 25 by 60 feet in size; to be of stone front and pressed brick sides, have hardwood finish, hot-water heating, electric

light and the best of sanitary improvements. For N. M. Goodale, at No. 509 Racine avenue, a three-story flat building, size 50 by 65 feet; to have a front of pressed brick with stone trimmings, sanitary plumbing, mantels, etc. Also made drawings for Baptist church, to be erected at Washington, D. C.; it will be 100 by 100 feet in size, have stone on two sides, handsome stained glass windows, electric light, ventilation plant, heating apparatus, etc.

Architect E. F. Bargman: For M. Kurz, corner of Blackhawk and Town streets, a three-story and basement flat building, 30 by 50 feet in size; to be of pressed brick and stone front and side, have the sanitary plumbing and cost about \$10,000.

Architect Oliver W. Marble: For S. W. Homer, at River Forest, a two-story basement and attic residence, 35 by 65 feet in size; to be of frame with stone basement, have hardwood interior finish and mantels, hot-water heating, the best of sanitary improvements, electric light, laundry tubs, etc.

Architects Crowen & Richards: For Wiggins, Starbuck & Co., at Williamsburg, a three-story building, 44 by 30 feet in size; to be of stone first story and pressed brick above; it will contain town hall, bank, safety deposit vaults and Odd Fellows' lodge rooms. Also made plans for remodeling residence on Lake avenue, near Fortieth street, for James Starbuck; hot-water heating, electric light, new interior finish in cherry quarter-sawn antique oak, etc.

Architect J. E. Scheller: For Mrs. M. E. Mifford, at Evergreen Park, a two-story frame residence; to have stone basement and all sanitary improvements. For L. D. Quail, at Twin Lakes, Wisconsin, a two-story, neatly designed frame summer residence. For D. J. Davis, at Lake avenue and Fifty-fifth street, a two-story concert hall, 80 by 50 feet in size; to be of brick, and cost \$8,000.

Architect R. W. Dahlgren: For John E. Nelson, on Paulina street, north of Leland avenue, Ravenswood, a two-story flat building, 24 by 56 feet in size; to have all the modern plumbing, mantels, furnaces, etc. Also a two-story flat building, 44 by 62 feet in size, to be erected on Paulina street, south of Lawrence avenue, Ravenswood; to be of buff pressed brick with buff Bedford stone trimmings, have hardwood finish and mantels, electric light, bells, speaking tubes, laundry tubs, furnaces, etc.

Architects Patton & Fisher are preparing drawings for the Academy of Sciences, to be erected in Lincoln park; it will be a handsome structure, 60 by 122 feet in size, three-story and basement; the basement and first story to be of stone and above this will be of light-colored pressed brick with terra cotta trimmings; the interior will be elaborately finished in marble, mosaic and tile work, have electric light, steam heating and all the conveniences; it will be absolutely fireproof, and cost upwards of \$100,000.

Architect F. B. Townsend: For Chapman Brothers, a four-story annex to the Hotel Vendome on Oglesby and Sheridan avenues; it will be 160 by 90 feet in size; of pressed brick and stone front, have steam heating, electric light, the best of sanitary improvements, hardwood interior finish and mantels, laundry tubs, etc., and cost about \$50,000. Also made plans for twenty two-story frame flat buildings, 22 by 42 feet each, to be erected at West Pullman, for James Smith; they will have brick basements, bathrooms, closets, mantels, furnaces, etc.

Architect W. J. Van Keuren: For J. D. Caldwell, at Ridgeland, a two-story basement and attic frame residence, 25 by 46 feet in size; to have stone basement, all the sanitary improvements, electric light, furnace, laundry tubs, etc.

Architects Stiles & Stone: For M. E. Herbert, a one-story factory, 50 by 125 feet in size; to be of common brick, with slate roof; it will be erected on Shields avenue near Pittsburgh & Fort Wayne tracks. Also, for A. T. Hinckley, on Lake avenue near Fifty-fourth street, a four-story store and apartment house; size 84 by 77 feet; to be of cutstone front, have hardwood finish, electric light, steam heating, the best of sanitary improvements, and cost \$35,000.

Architects Brainerd & Packard: For Chicago & Eastern Illinois Railway Company, at Chicago Heights, a station 160 feet long by 35 wide; to be constructed of buff pressed brick and stone. For Putnam county, a two-story addition to courthouse, at Hennepin, Illinois; to be of common brick, tuck pointed; all fireproof construction.

Architect R. T. Newberry: For M. Weber, on Dearborn and Twenty-fourth streets, a four-story and basement apartment house, 25 by 80 feet in size; to be of pressed brick and stone front, have all the sanitary improvements, mantels, etc. For George C. Stirling, at Battle Creek, Michigan, a two-story residence, 25 by 50 feet in size; to be of frame with stone basement, have all the improvements, electric light, etc.

Architects Lamson & Newman: For G. G. Gavitt, on the southeast corner of Whipple and Jackson streets, two two-story flat buildings, 50 by 70 feet each, to be of stone fronts, have all the sanitary conveniences, hardwood finish and mantels, electric light; cost about \$20,000.

Architect George W. Maher: For W. W. Jackson, at Seventy-first street and South Chicago avenue, a three-story frame hotel, 116 by 60 feet in size; to have modern conveniences, and cost \$15,000.

Architects Treat & Foltz: Made plans for remodeling the Columbus Club, on Monroe street opposite Palmer House; they will raise up building fifteen feet and put under one story; there will be a bank on the main floor, and safety deposit vaults in the basement; to be finished in marble, mosaic and tile work, have steel beams and columns and be strictly fireproof.

Architect W. K. Johnston: For George Coffin, at Oak Park, a two-story frame residence, 34 by 48 feet in size; to be of stone basement, have hardwood finish and mantels, electric light, all the modern sanitary conveniences, laundry tubs, electric bells, speaking tubes, cement basement floors, etc. For J. T. Hayden, at Oak Park, a two-story frame residence, 34 by 48 feet in size; to have a stone basement, hardwood interior and mantels, brick veneer for the first story, all the sanitary plumbing, electric light, heating apparatus; cost \$7,000. For Mrs. Smyth, at Austin, a two-story frame residence, 28 by 40 feet in size; to be of brick basement and frame; have all the improvements and electric light. For G. W. Stradtman, at Morgan Park, a two-story frame residence; to have stone basement, electric light, all sanitary improvements, mantels, etc.

Architect W. R. Clayton: For Mrs. Caverley, at Hill street near Wells, a four-story flat building; size 25 by 90 feet; to have a front of stone, the interior hardwood finish, all the sanitary plumbing, mantels, furnace, etc. For James Findley, at Wabash avenue near Fifth street, a two-story flat building, 22 by 64 feet in size; to have a front of pressed brick with stone trimmings, all the sanitary conveniences, mantels, furnace, etc.

Architect Louis Martens: For Mrs. E. Smith, at Kankakee, Illinois, a two-story frame residence; size 30 by 60 feet; to have stone basement, hardwood finish, mantels, sanitary plumbing, furnace, etc. For H. A. Foster, a two-story flat building, 130 by 60 feet in size; to have a pressed brick and stone front, and all improvements. For Olson and Baker, on Emerald avenue near Root street, a three-story apartment house, 50 by 87 feet in size; to have a front of pressed brick and stone, the best of modern improvements, and cost \$20,000. For Jacob Vogler, at Madison avenue near Sixty-fifth street, a two-story flat building; to be of frame and have all the improvements.

Architect Lars Backvall: For Mr. Charles Andersson, on Kenwood place, three-story and basement brick building, with Bedford stone front, in French Gothic style; size 25 by 80 feet; to have hardwood finish, marble wainscoting in vestibule and bathrooms; laundries and separate water closet for kitchen departments in every flat; hot water, steam heating, gas and electric lighting and the best sanitary improvements; will cost \$15,000. For Mr. C. Bargen, on Western avenue, two-story and basement flat building, of brick and Bedford stone front; size 22 by 50 feet; modern improvements; cost \$5,000. For Mr. Andrew Hanc, on Austin avenue, in Austin, frame residence, two stories and basement, with hardwood and pine finish, mantels and modern improvements. For the Alpine Heights Furniture Company, Alpine Heights, factory building of frame and veneered brickwork, four stories and basement; size 241 by 81 feet; engine house of brick, 74 by 45 feet in size; dry kiln, frame, 64 by 54 feet in size, with a capacity of 120,000 cubic feet; water cistern of stone and cemented 10 feet deep, 60 by 30 feet in size; large chimney 85 feet high, with machinery, track and improvements.

Cincinnati, Ohio.—Reported by Lawrence Mendenhall: I have been trying to find out, now that the blue birds and robins are with us again, what the real prospects for trade are. My efforts have not been entirely successful, for the reason that a decided diversity of opinion exists. The architects have their boards reasonably well filled and seem hopeful, although much of the large work is for outside towns, which are bestirring themselves. Ohio, Indiana and Kentucky are the busy states. On the other hand, many of the contractors are inclined to take a pessimistic view, saying that they cannot tell what

the summer will bring forth. Several new architectural firms have sprung into existence during the last month. Dittoe & Wisenall is the name of a firm of young architects. Both gentlemen were among the most prominent draftsmen of this city, and if talent and good business tact count for anything there is no doubt but that they will soon rank among the successful architects. They have located in the Neave building. Blitz & Allen is the style of the new firm of architects who have quarters in the Penn building, Cincinnati, Ohio. Mr. Blitz is a French architect, formerly of Chicago. Mr. Allen has been for several years superintending buildings in Philadelphia in connection with large contractors. Both are young men and full of vim and push and with the latest ideas in their line, and we wish for them good business. Another new firm is that of Sweeney & Robinson, both live, energetic young men. Mr. Sweeney is from Philadelphia, and is an architect of experience. Mr. Robinson is also an architect who has several fine buildings to his credit. Another architect who will no doubt capture many plums is Mr. Paul C. Pope, Pike building, Cincinnati.

Architects Crapney & Brown report as follows: For Portsmouth, Ohio, an opera house and hotel; materials, pressed brick, tin roof, plate and stained glass, architectural iron, steam heat, elevator, scenery, grates, mantels, blinds, chairs, etc.; cost \$30,000. Baptist Congregation, Dayton, Kentucky, a church edifice; materials, stock brick, slate roof, hardwood pews, gas, etc.; cost \$10,000. Presbyterian Congregation, at Henderson, Kentucky, a church edifice; materials: stone, slate roof, furnace, hardwood pews, stained glass, frescoing, etc.; cost \$50,000. Remodeling the First Presbyterian Church, of Walnut Hills, Cincinnati, Ohio, at a cost of about \$4,000, adding rooms, etc.

Architects S. Hannaford & Sons report as follows: For the George H. Dean and Kite Brothers' Company, Cincinnati, a store building; materials: pressed brick, tin roof, elevator, steam heat, etc.; cost not given. For the German Methodist Episcopal Congregation (care architects), a church edifice; materials: pressed brick, slate roof, hardwood pews, stained glass, furnace, etc.; cost not given.

Architect James W. McLaughlin has prepared plans for Mr. R. M. Shoemaker, Cincinnati, for a residence; materials: pressed brick, stone, slate roof, hardwood, furnace, grates, mantels, stained glass, decorating, etc.; cost \$20,000.

Architect Gustave W. Drach is busy on plans for Mr. E. Hart (care architect), for a residence; materials: pressed brick, slate roof, hardwood, furnace, grates, mantels, stained glass, etc.; cost \$15,000. He has also drawn plans for Mr. William A. Goodman, president Lafayette Bank; also for Dr. Robert Sattler.

Architects Des Jardin & Haywood have drawn plans for a residence for Mrs. A. Segal (I. Faller & Sons), Cincinnati; materials: pressed brick, slate roof, furnace, hardwood, grates, mantels, stained glass, etc.; cost \$10,000. Also plans for a residence for George W. Laws, Esq., Clefion, Cincinnati, Ohio; materials: frame and shingle, shingle roof, hardwood, furnace, mantels, grates, gas, plumbing, etc.; cost \$10,000.

Architect W. W. Franklin has drawn plans for a store and flat building for Mr. Charles Domhoff (M. Addy & Co.), Cincinnati; materials: pressed brick, stone trim; heating not settled; iron work, grates, mantels, tin roof, gas, plumbing, etc.; cost \$20,000.

Architect J. G. Steinkamp has drawn plans for J. H. Lippelman for a store and flat building; materials: pressed brick, stone trim, tin roof, pine finish, gas, plumbing, etc.; cost \$8,000.

Architect L. Picket reports: For Hanke Brothers, a large warehouse, 50 by 250 feet; three stories; materials: pressed brick, stone, tin roof, iron, steam heat, elevator, etc.; cost \$30,000.

Architect Emil G. Reuckert has prepared plans for Charles B. Fishburn, Cincinnati; materials: pressed brick, slate roof, hardwood, hot-air heat, grates, mantels, stained glass, gas, plumbing, etc.; cost \$10,000. Messrs. Sweeney & Robinson have prepared plans for a fine schoolhouse at Bond Hill, Ohio; materials: stock brick, tin roof, furnace or stoves, blackboards, etc.; cost \$15,000. They also have prepared plans for a \$5,000 frame dwelling for Mr. Lockhorn to be built at Hyde Park. Also plans for frame dwellings for Adolph Falk, at Delhi; Mr. Gutzwiller, Taylor street, Fairmount, and A. W. Corn, Bullitsville, Kentucky.

Architect Paul C. Pope has prepared plans for the Sander Packing Company for the addition of two stories to the two-story portion of their Oehler street establishment, this making it of uniform height with the rest of their buildings. The same architect has also the plans for a frame cottage for C. D. Battelle, of the Ohio Roofing Company, to be built at Pleasant Ridge.

Architects Blitz & Allen report: they have on the boards, in connection with other work, plans for Methodist church, to be erected in North Carolina; building to be 140 by 150 feet, one-story and basement, auditorium, 60 by 110 feet, seating 800; Sunday school room seating 400; parlors, class rooms and pastor's study. The building is to be of Roman Akron pressed brick with red granite trimmings and terra cotta, the tower over main entrance to be 178 feet high; style of building is Roman and Norman. They desire estimates on bevel and stained glass, slate roofing, pews, clock and bell. The method of heating and ventilation is to be of the Peck-Smead system. The building is expected to cost \$40,000.

Cleveland, Ohio.—Architect J. W. Russell reports a brick and wood foundry building for the Gatland Foundry Company; to cost \$10,000.

Architect Godfrey Fugman: For Cleveland Crematory Company, a stone crematory building, 55 by 68 feet in size, to be built on Euclid avenue near Lake View Cemetery; cost \$18,000. For I. Brudno, a three-story stone and pressed brick business block, 25 by 100 feet; cost \$10,000. For the Saengerfest Company, an iron, steel and frame Saengerfest building, 200 by 200 feet in size, clear span without posts; cost \$35,000; building at the corner of Willson and Scovill avenues.

Architects Coburn & Barnum report a frame house and stable for Joshua Gregg, for which ground has been broken; to cost \$20,000; house is to be 45 by 70 feet in size; frame finished attic, slate roof, hardwood interior finish, mantels and all modern improvements. For George W. Howe, a brick and terra cotta residence, 52 by 104 feet in size; cost \$25,000, all modern improvements, hardwood interior.

Architects Lehman & Schmitt: For King & Uhl, a three-story brick and stone office and store building, 66 by 130 feet in size; cost \$25,000; steam heat; to be built on Euclid avenue. For F. Hirscheimer, a \$15,000 brick residence, all modern improvements, hot-water heat; a country residence for Julius Feiss, on Lake avenue; frame, 60 by 125 feet in size; cost \$40,000; all modern improvements, including steam heat and electricity. For same party, a gardener's cottage and stable, costing \$5,500; both frame buildings, respectively 26 by 40 and 30 by 45 feet in size.

Architects Sprackling & Lougee report that the building committee of the Cleveland Grays Armory have purchased their plans and elevations for the proposed armory, and will use them in part in the building. For Lewis Miller, a frame residence, 26 by 48 feet in size, hardwood interior, hot-water heat, mantels; cost \$4,500.

Denver, Colo.—Architect F. C. Kidder: For George Bailey, three two-story brick houses; size 27 by 43 feet; cost \$21,000.

Architects Varian & Sterner: For George Campbell, a two-story brick dwelling; size 25 by 44 feet; cost \$5,900.

Architect William Quayle: For W. P. Murphy, a two-story brick store building; size 75 by 75 feet; cost \$11,000.

Architects F. E. Edbrooke & Co.: For Kent Stretchfield, a three-story business block; brick and stone; size 50 by 120 feet; cost \$15,800.

Architect R. S. Roeschlaub: For No. 1 School District, a one-story school building; brick and stone; size 59 by 135 feet; cost \$5,350.

Architect P. C. Eberley: For Vorwärts Turn-Verein, a one-story brick assembly hall; size 66 by 88 feet; to cost \$6,000.

Architect W. P. Fesh: For Emma Cox, a two-story brick residence; size 25 by 36 feet; to cost \$5,000.

Architects J. S. Brian & Co.: For Charles R. Pratt, a two-story brick residence; size 23 by 53 feet; cost \$5,960. For W. G. Riddick, a two-story brick residence; size 32 by 37 feet; cost \$8,950; contractors Mount Lumber Company. For M. Wunder, a two-story brick dwelling; size 31 by 38 feet; to cost \$6,900.

Architects' names not reported for the following: For L. C. Haynes, two three-story dwellings; brick and stone; size 22 by 73 feet; cost \$13,000. For P. J. Brennan, a two-story brick house; size 23 by 44 feet; to cost \$5,900. For

George Filbeck, a two-story brick house; size 31 by 48 feet; cost \$5,960. For Martin Melhorn, two two-story dwellings; brick and stone; size 32 by 40 feet; cost \$20,000. For J. B. Peterson, a two-story brick dwelling; size 40 by 43 feet; cost \$12,000.

Detroit, Mich.—Architects M. L. Smith & Son: For the Home Savings' Bank, a eight-story brick and stone building, on corner of Michigan avenue and Griswold street; size 46 by 80 feet; to cost \$250,000. For the First Commercial and Savings' Bank Association, Wyandotte, Michigan, a three-story brick and stone office building; to cost \$20,000.

Architects A. C. Varney & Co.: For the Detroit Machine Screw Works, a three-story brick manufactory building; size 200 by 100 feet; cost \$25,000. For John Hawley, a four-story apartment building, corner of John R. and Columbia streets; size 100 by 45 feet; cost \$30,000.

Architect H. J. Kill: For the Morton Baking Company, a three-story brick bakery; size 60 by 60 feet; cost \$13,000.

Architects Spier & Rohus: For the Detroit Chamber of Commerce, to be built on corner of Griswold and State streets, twelve stories high, fireproof construction; size 85 by 100 feet; cost \$400,000.

Architect R. E. Raseman: For T. H. A. Backus, a two and one-half story brick residence; to cost \$10,000. For J. C. McGregor, remodeling brick residence; cost \$10,000. For J. Pencein, a two-story brick store and flat building on Michigan and Sixth streets; to cost \$10,000.

Architect J. E. Mills: For Joseph T. Hasty, a two-story brick residence; cost \$8,000. For William H. McFall, a two-story double frame residence; cost \$7,000.

Architects Mason & Rice: For Charles E. Bloomfield, Jackson, Michigan, have prepared plans for a public library; to cost \$30,000.

Architect Ed. C. Van Leyen: For Mrs. Mary Fifield, a two-story frame store and flat building, on Grand R. avenue; to cost \$5,000. For A. N. and V. F. Morris, four three-story brick houses on Milwaukee avenue, between Woodward avenue and Cass street; cost \$18,000. For A. J. Van Leyen, a two-story brick store and flat building; to cost \$5,000.

Architects Jacques Rantoul & Co., of Boston: For the Union Trust Company, a ten-story office building, to be built on corner Griswold and Congress streets; to cost \$400,000.

Kansas City, Mo.—Architect L. G. Middaugh: For the city of Independence, a modern school building, brick, two stories high, and containing eight rooms; to cost \$13,000. For J. J. McPeters, a two-story residence, at Elma and Prospect avenues, of pressed brick and brownstone, copper cornice; to cost \$12,000. For Dr. John Bryant, a three-story brick business house, 39 by 115 feet in size, on Main street, Independence; to cost \$15,000.

Architects Gunn & Curtis: For the Soldiers' Home at Leavenworth, a brick hospital building, 180 by 32 feet in size, two stories high; to cost \$12,000. For the Progress Club, a three-story club house, of brick and terra cotta; to cost \$30,000. A committee of the club is now engaged in selecting a site, the choice being between two properties. Building will at once begin when choice is made.

Architect James Bannon is closing up his business and proposes to spend a year in Europe.

Architect G. M. D. Knox: For Mrs. Mary Adkins, a modern three-story business house, 50 by 111 feet in size, on the east side of Walnut between Eleventh and Twelfth streets; to cost \$25,000. For Thomas Gillespie, a two and one-half story brick residence, on the east side of Troost avenue near Twenty-eighth street; to cost \$10,000. For John J. Green, block of flats on Brooklyn avenue just north of Independence avenue; three stories, of brick and cut stone; to cost \$30,000.

Architect Walter C. Root: For the Realty Investment Company, a dwelling on Wabash avenue near Independence; two stories, basement and attic, of brick; to cost \$7,000. For Frank Simpson, a dwelling on Olive street near Independence avenue, of brick; two stories, attic and basement; to cost \$5,000.

The firms of Gunn & Curtis and Van Brunt & Howe have been invited by the authorities of the Kansas State University to furnish plans in competition with other architects for a new library building for the university.

Architects Knox & Guinotte: For Thomas Green, three-story flat houses at Eleventh and Wyandotte streets, 44 by 75 feet, of pressed brick, with stone trimmings; to cost \$15,000. For the John Deere Plow Company, a five-story brick warehouse, 60 by 110 feet, at Thirteenth and Hickory streets; to cost \$40,000. For Langston Bacon and D. O. Smart, brick business block, 39 by 115 feet, three stories, on Main street, between Tenth and Eleventh; to cost \$15,000. For D. O. Smart, on the site of the burned Jaccard building on Walnut street, five-story business block, with pressed brick front; to cost \$45,000. For A. J. Gillespie, pressed brick residence at Twenty-eighth street and Troost avenue; to cost \$15,000.

Architects Hackney & Smith: For Huke & Sexton, four brick residences at Twenty-fifth street and Troost avenue; to cost \$8,000 each. For P. H. Hovey, brick residence on Lydia avenue between Thirty-second and Thirty-third streets; to cost \$6,000. For L. T. Brown, brick residence at Linwood and Lydia avenues; to cost \$6,000. For Mrs. F. R. Massey, at Springfield, Missouri, a brick residence; to cost \$5,000.

Milwaukee, Wis.—Architect W. A. Holbrook: For Rice & Friedman, a three-story store and flat building, 100 by 180 feet in size; stone and brick; cost \$50,000. For Reilly Brothers, a four-story flat building, 60 by 60 feet in size; brick, with terra cotta trimmings and all modern improvements; cost \$30,000.

Architect H. Russell: For C. D. Larkin, a four-story store building, brick and stone; to cost \$25,000.

Pittsburgh, Pa.—Architect F. J. Osterling: For the Pittsburgh First Methodist Episcopal Church, a two-story stone church building, 200 by 200 feet in size, on the corner of Aiken avenue and Howe street; to cost \$25,000.

Architect W. S. Fraser: For the Sixth U. P. Church, a one-story church building of rough stone; to cost \$175,000.

St. Louis, Mo.—Architects A. Weiden & Son: For J. C. Somerville, a two-story brick and stone residence, size 46 by 53 feet; to cost \$18,000.

Architect F. Thoms: For Mrs. E. W. Horstman, a two-story store and flat building, size 43 by 50 feet; to cost \$10,000.

Architect M. T. O. Allard: For R. B. Grant, three two-story dwellings, size 26 by 58 feet, stone and brick; to cost \$15,000.

H. E. Rost will build a four-story store and office building, brick and stone; to cost \$40,000.

Contractors Borthé & Roberman: For Mrs. Brinkwarth, four three-story stone flats, on corner Cass avenue and Hogan street; to cost \$39,000.

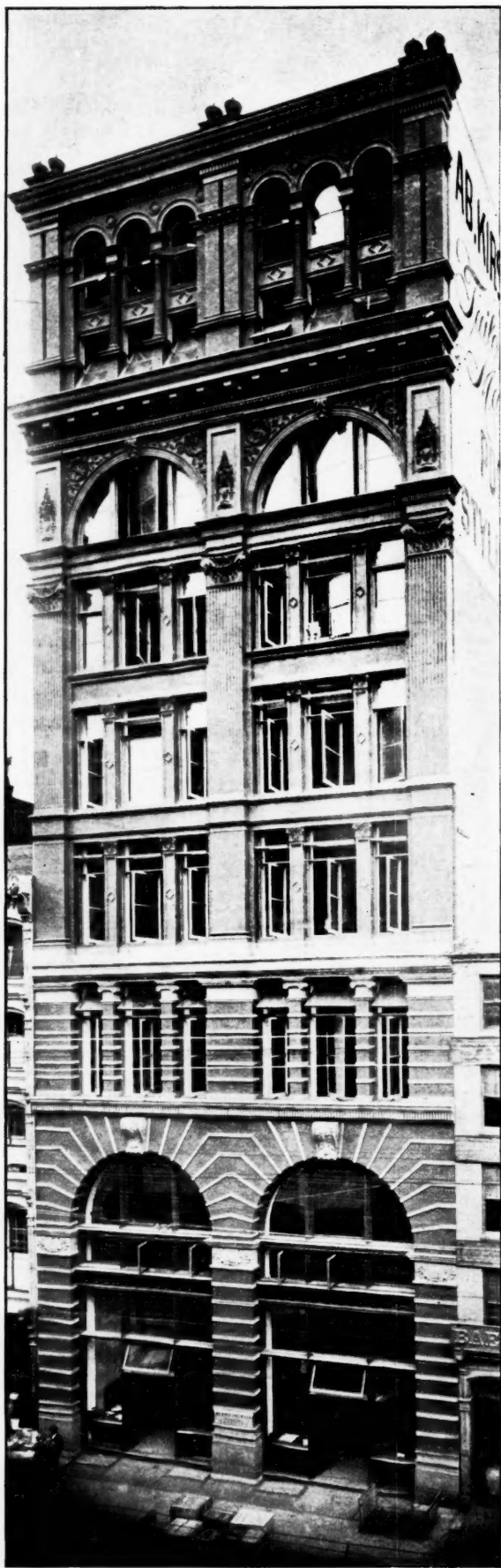
St. Paul, Minn.—Architect J. Walter Stevens reports plans for a five-story brick and stone building for the Konantz Saddlery Company, 50 by 100 feet, near the corner of Sixth and Wacouta streets; to cost \$40,000. Also for an eight-story brownstone business block on Fourth street, between Cedar and Minnesota streets, to be made ready for occupancy when two stories are built.

Architect A. F. Gauger reports plans for a four-story brick and stone business building on Wabasha street, near Eighth street, 25 by 150 feet; to cost \$25,000. Plans are also drawn for a two-story brick block on the corner of St. Peter and Exchange streets; to cost \$10,000; Phillip Potts is the owner.

Architect Herman Koetz has completed plans for a three-story brownstone apartment house on Summit avenue, between St. Peter and Rice streets; to cost \$35,000; to be built by Judge C. E. Otis. Also for a six-story brownstone apartment house, 60 by 180 feet, on Summit avenue, near Sixth street, for Ross Clarke; to have all modern improvements, and to cost \$150,000. Also two brownstone dwelling houses for Joseph Lockey, on Summit avenue, near St. Albans street; to cost \$25,000, and to have hardwood finish, plate glass and all modern improvements. Also a \$24,000 stone and brick church at Hastings, Minnesota, for the St. Boniface Society, and an eight-room school building for St. Michael's parish, Stillwater, Minnesota; to be of brick and stone, and to cost \$20,000.

Architect Cass Gilbert is preparing plans for a brownstone residence to be erected by W. H. Lightner, on Summit avenue, opposite Farrington.

Architects Reed & Stem have just completed plans for a temporary auditorium building, 150 by 150 feet, on Eighth and Ninth streets, between Cedar and Minnesota streets; it will be of frame, with façades covered with staff; it is to be erected for the St. Paul Auditorium Company.

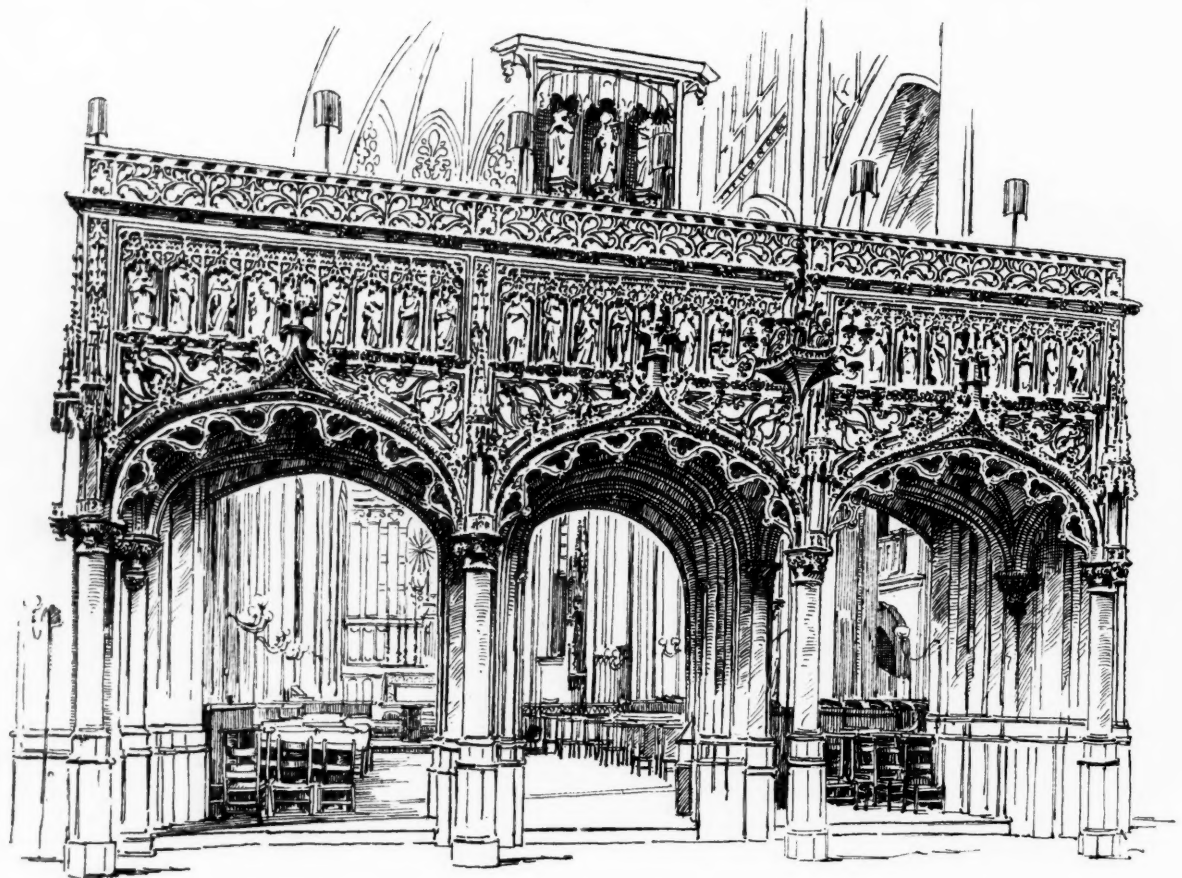


KIRSCHBAUM BUILDING, PHILADELPHIA.

FRANK R. WATSON, ARCHITECT.

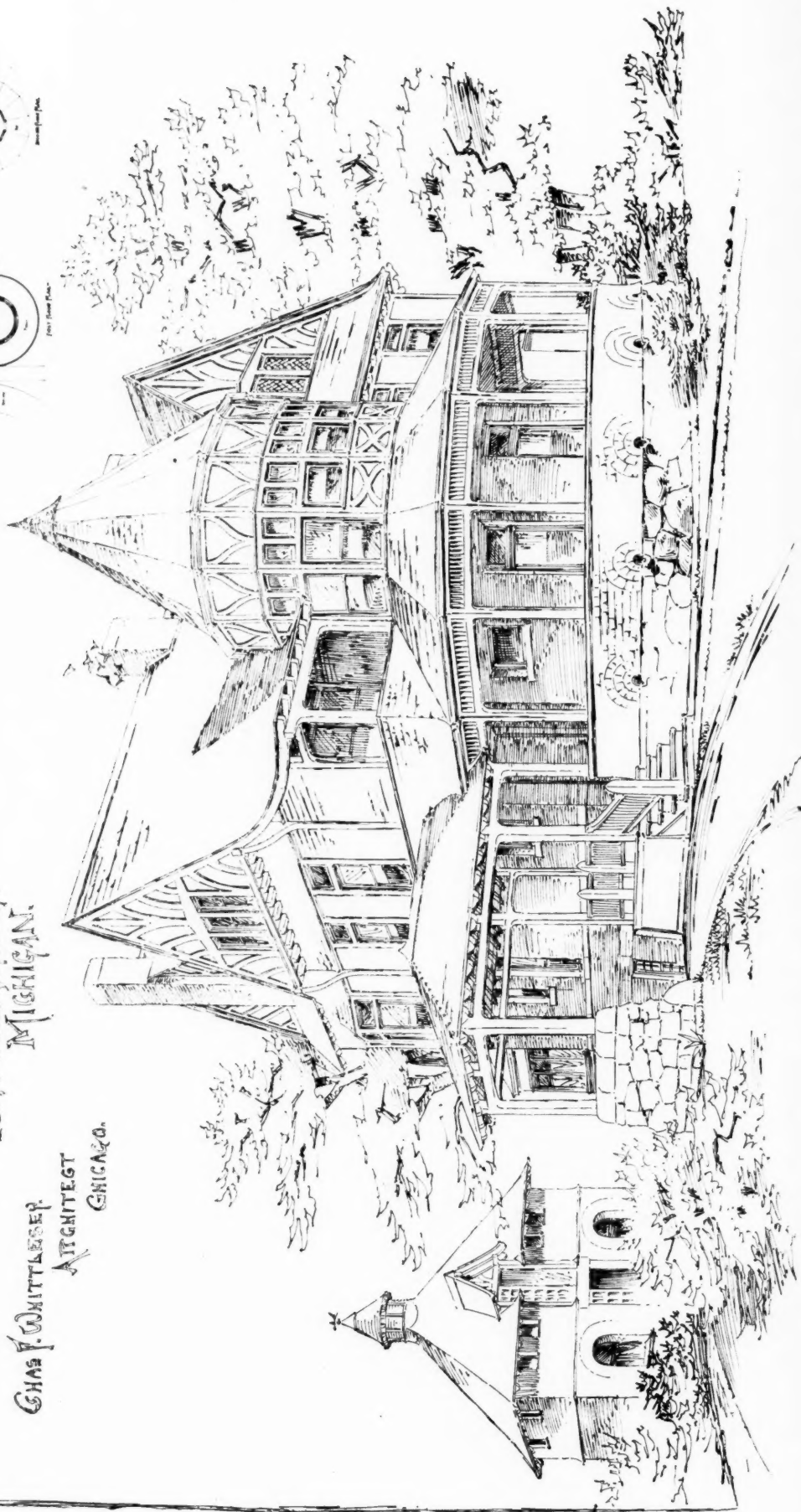
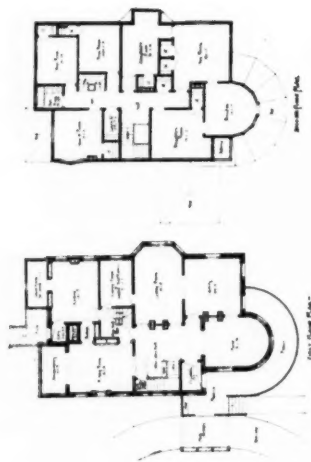


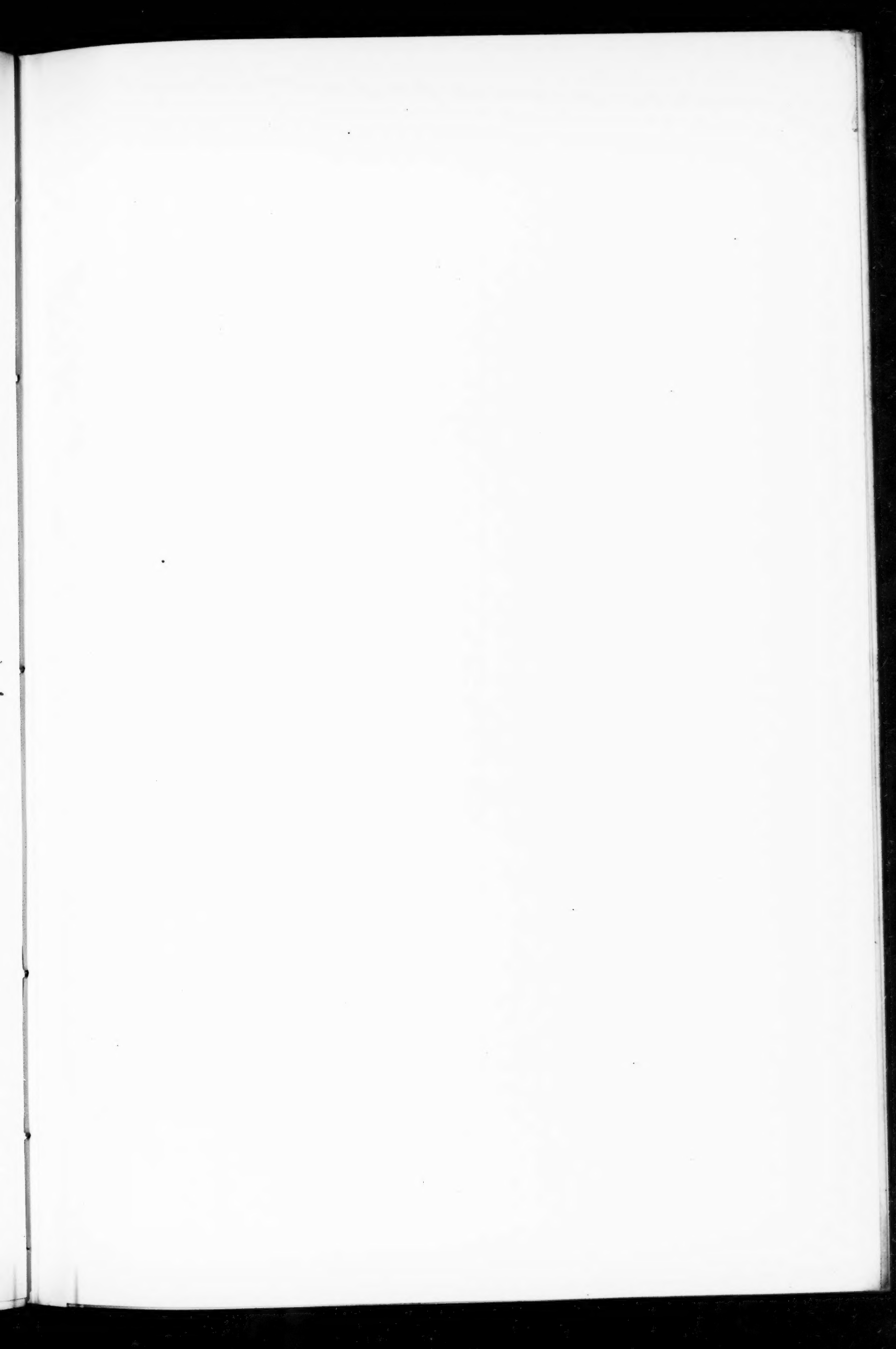
CATHEDRAL of the SACRED HEART
AND
Episcopal Residence
DULUTH, MINN.
G.A. TENBUSCH ARCHITECT.

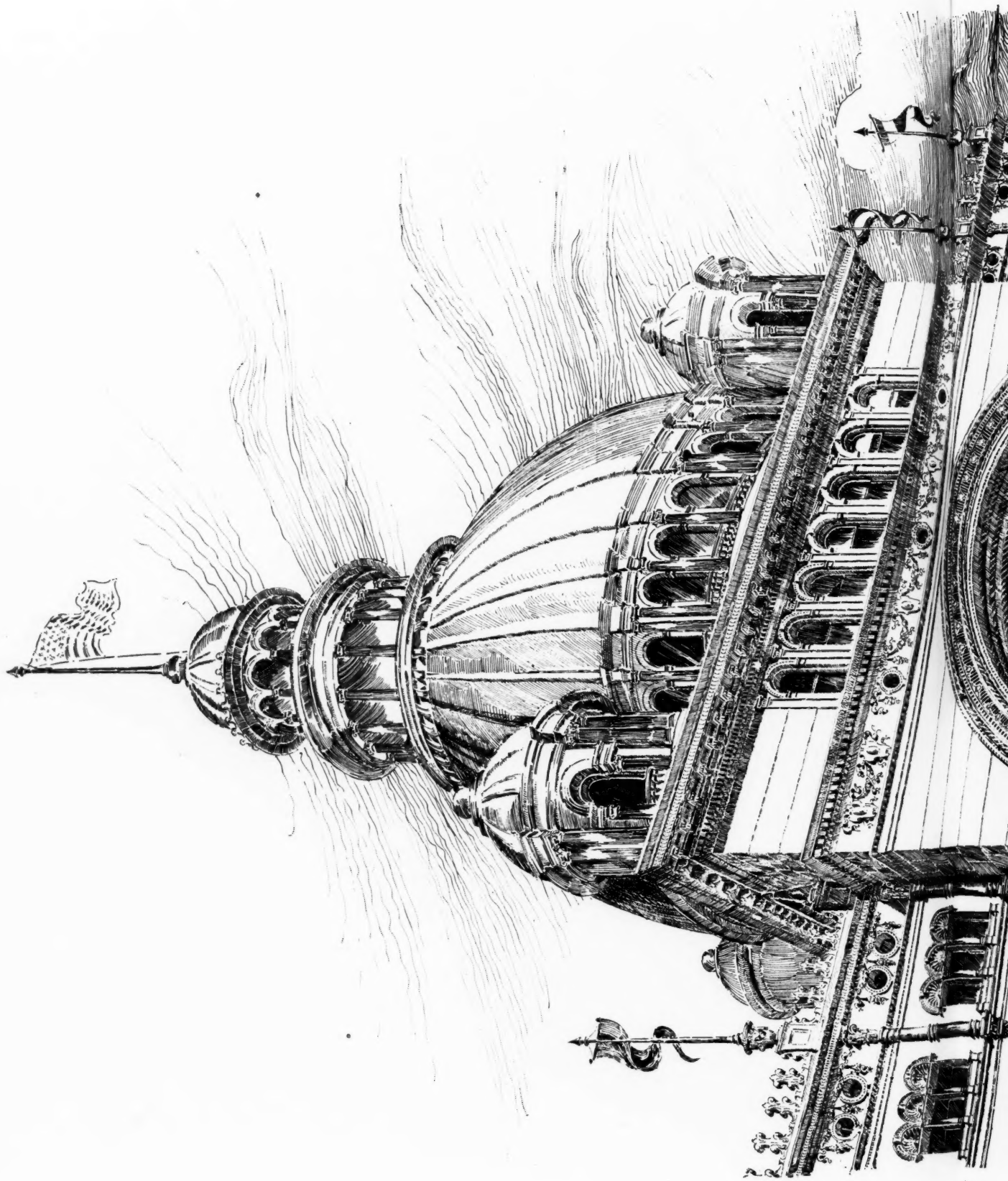


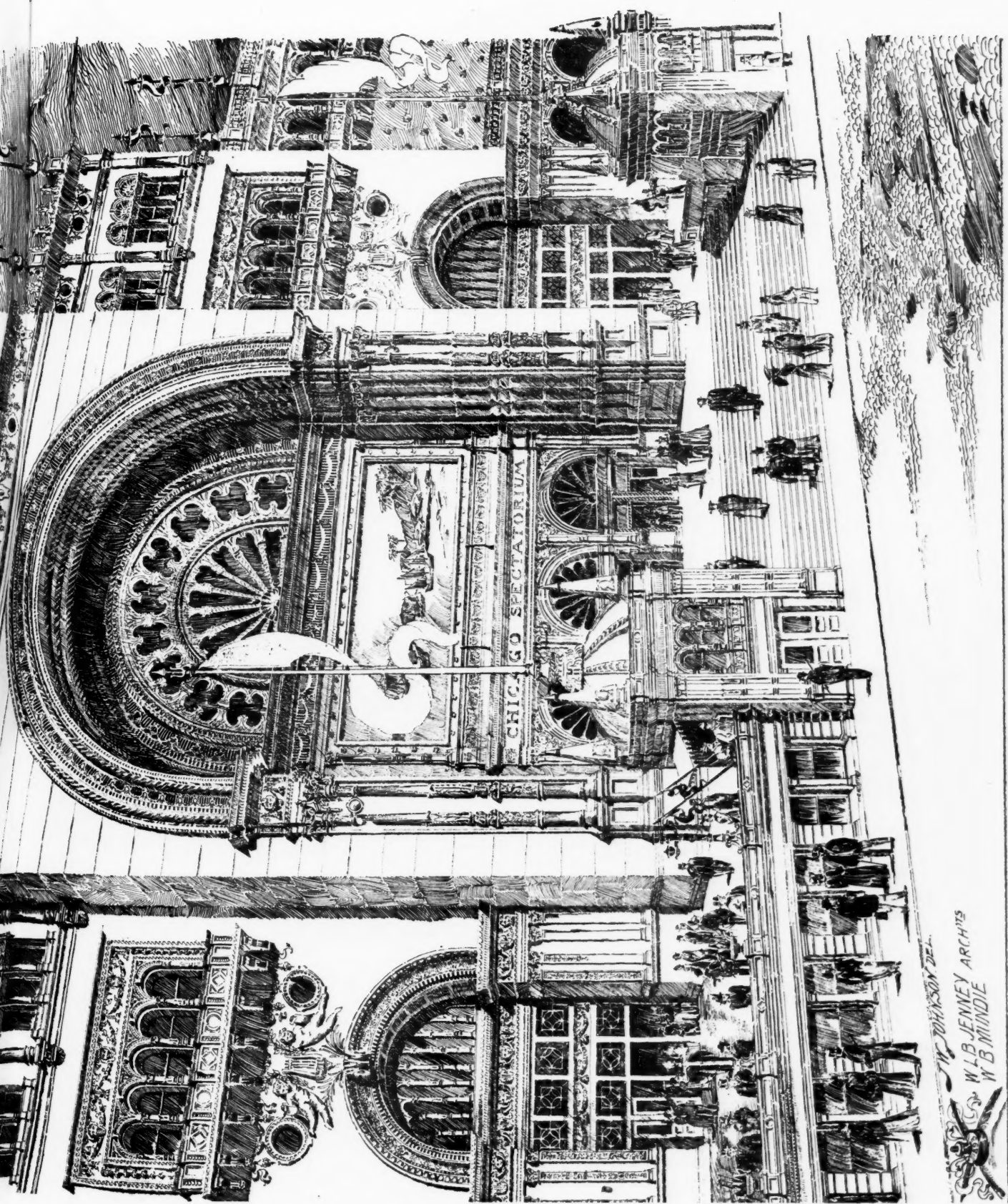
HOUSE FOR MR. A. BURTIS —
BUFFALO - N. Y.
E. A. Keri Archt. Buffalo - N. Y.

RESIDENCE, FOR
B. T. SKINNER ESQ.
BATTLE CREEK,
MICHIGAN.
CHAS. F. WHITTAKER
ARCHTITECT
CHICAGO.



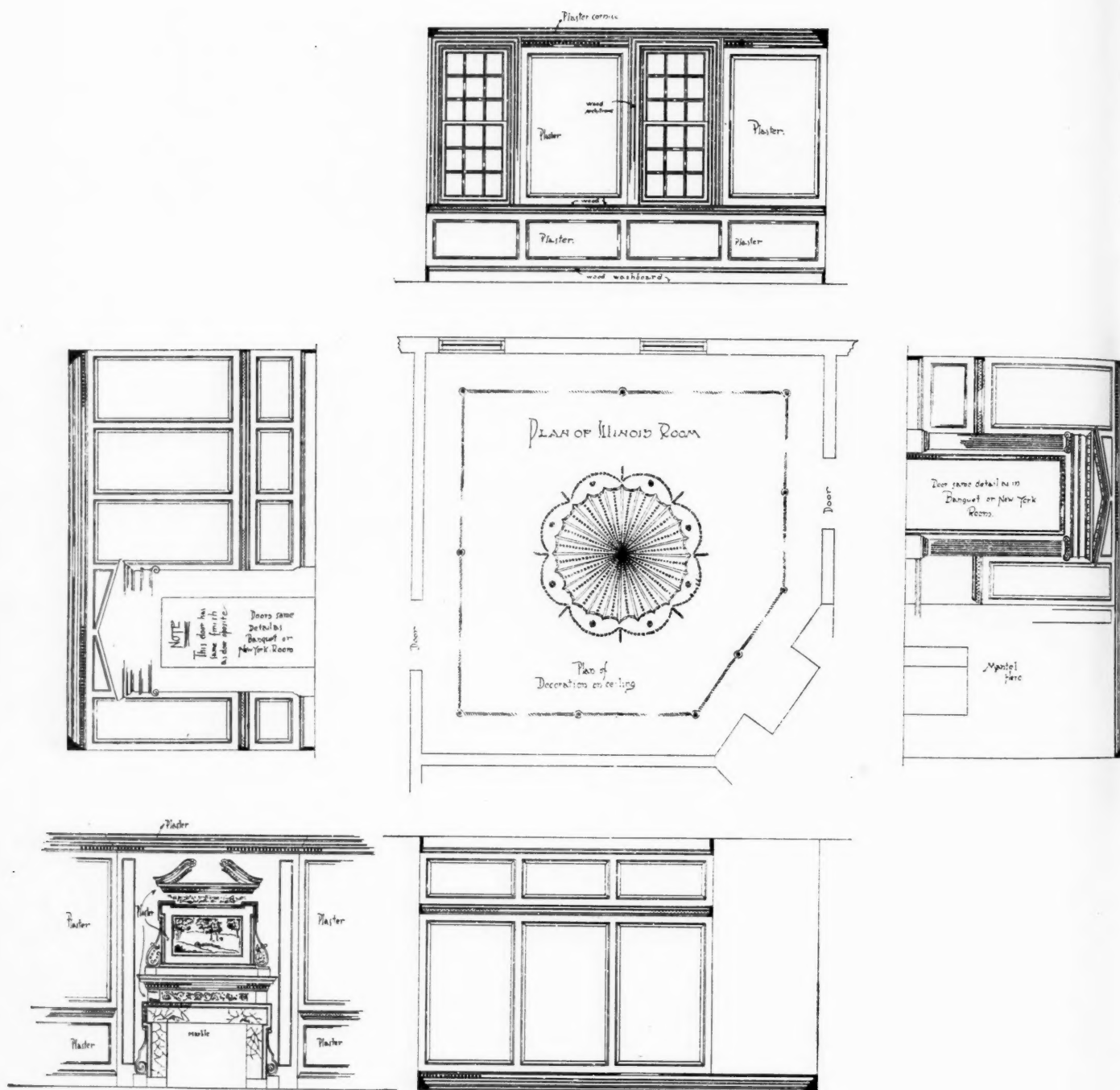






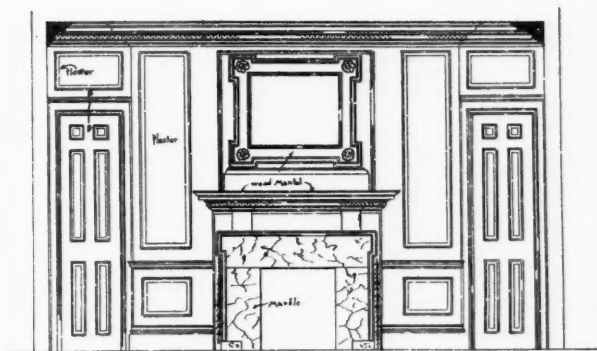
THE CHICAGO SPECTATORIUM, FIFTY-SIXTH STREET AND THE LAKE, CENTRAL PAVILION AND GRAND ENTRANCE.

W. L. B. JENNEY AND W. B. MUNDIE, ARCHITECTS.

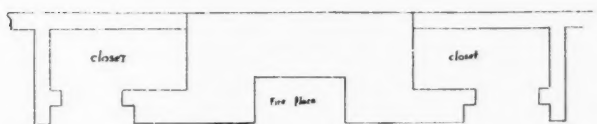


DETAILS OF THE HOME OF WASHINGTON

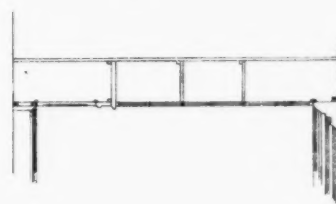
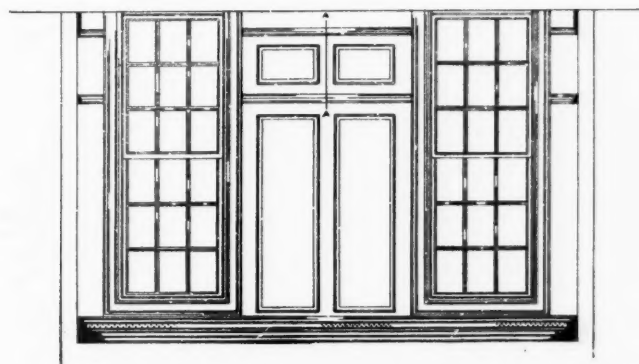
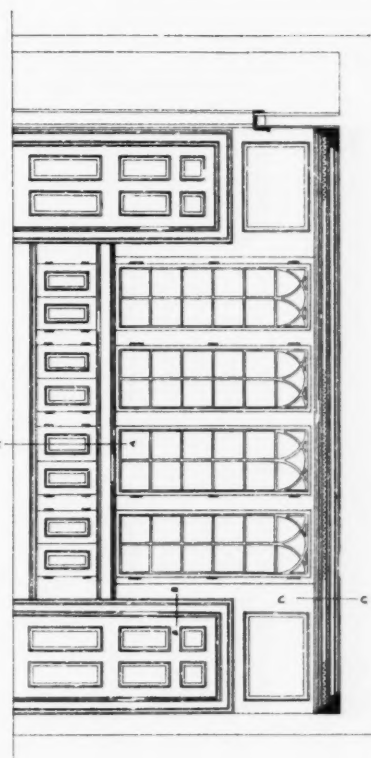
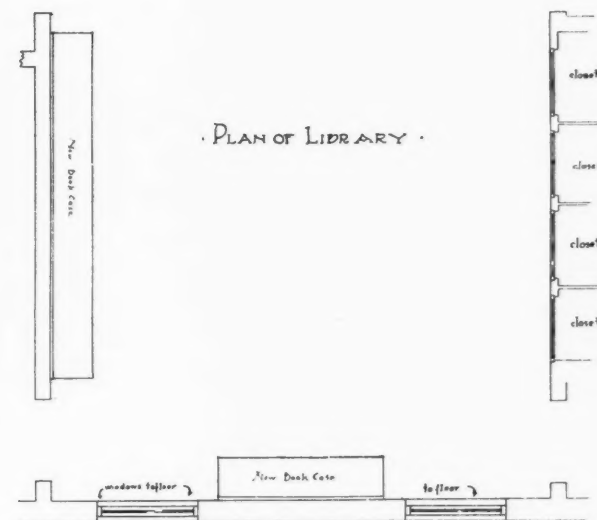
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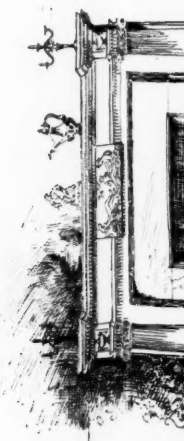
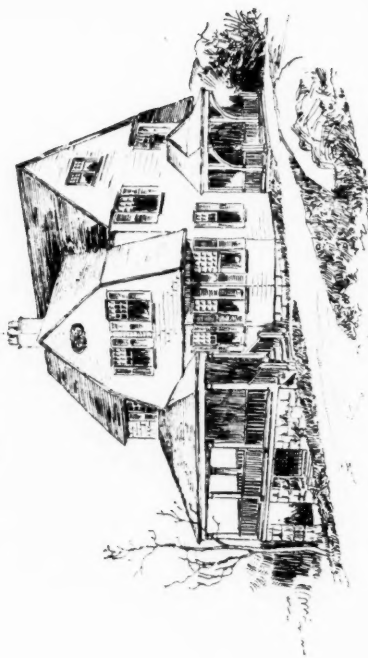
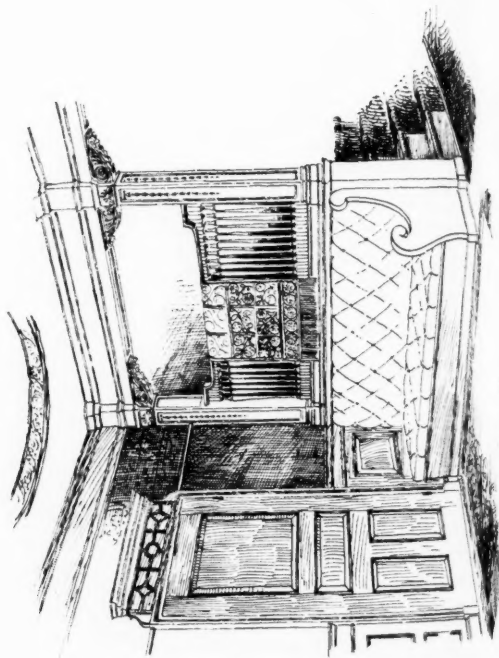
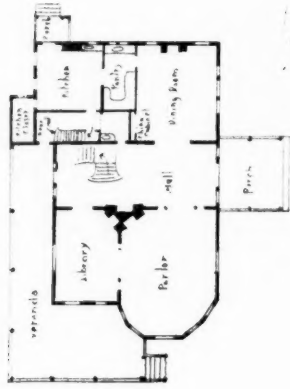
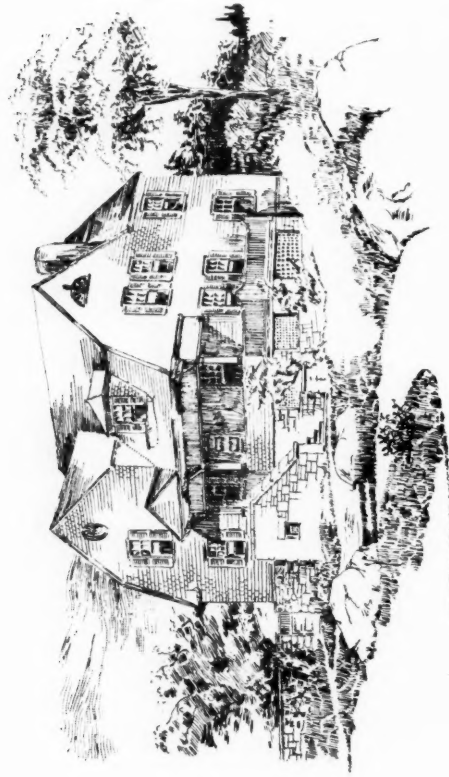


• PLAN OF LIBRARY •

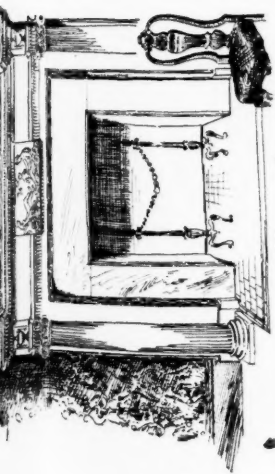


WASHINGTON, MOUNT VERNON, VIRGINIA.

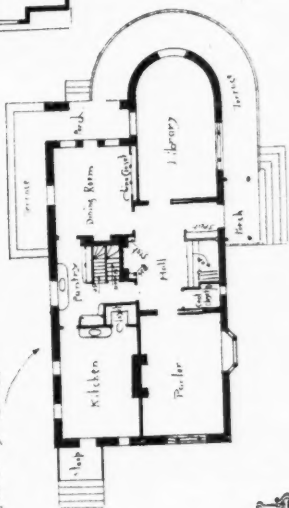
From measured drawings by EDGERTON S. ROGERS, Architect, Richmond, Virginia.



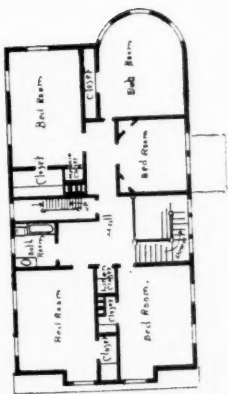
E.G.W. Dietrich Architect 10 Broadway
New York N.Y.



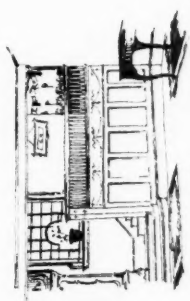
Portico Model



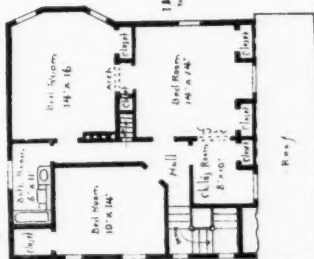
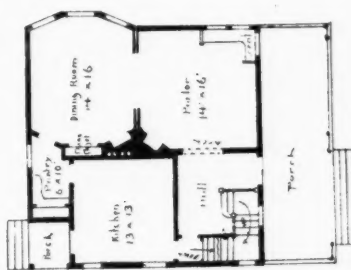
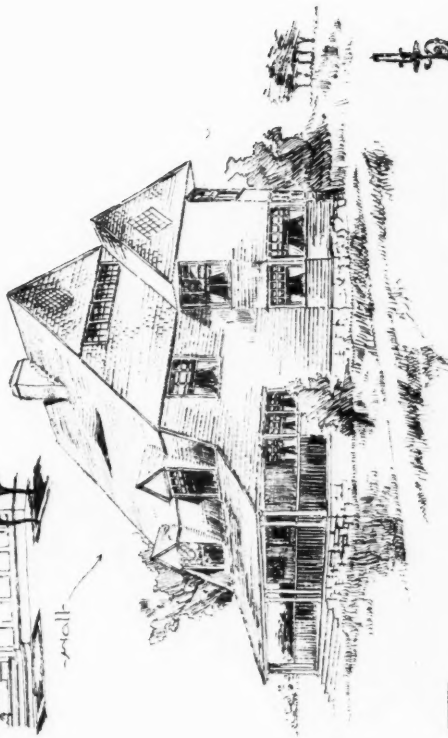
Small Cast Bracket



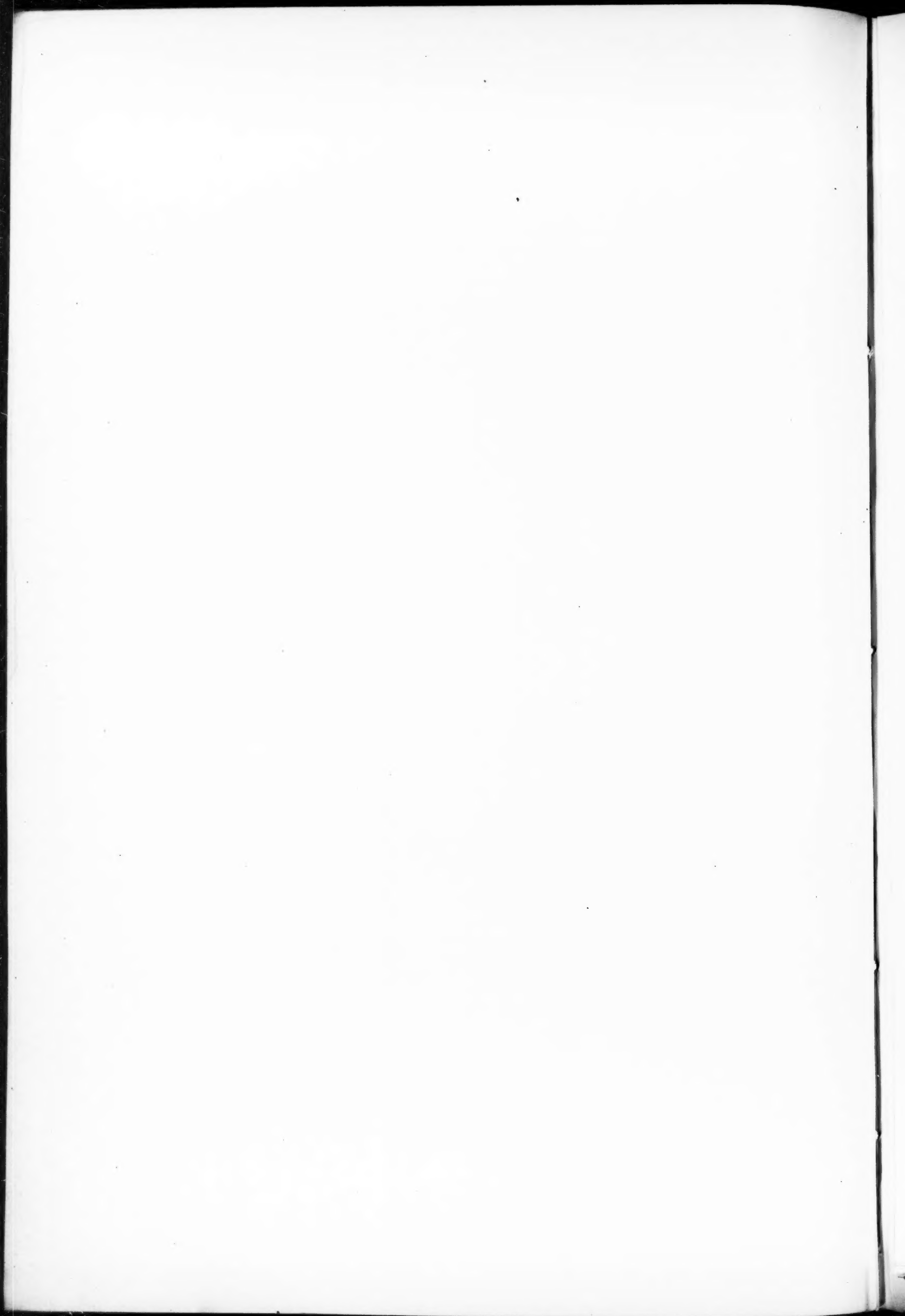
Hall



Small



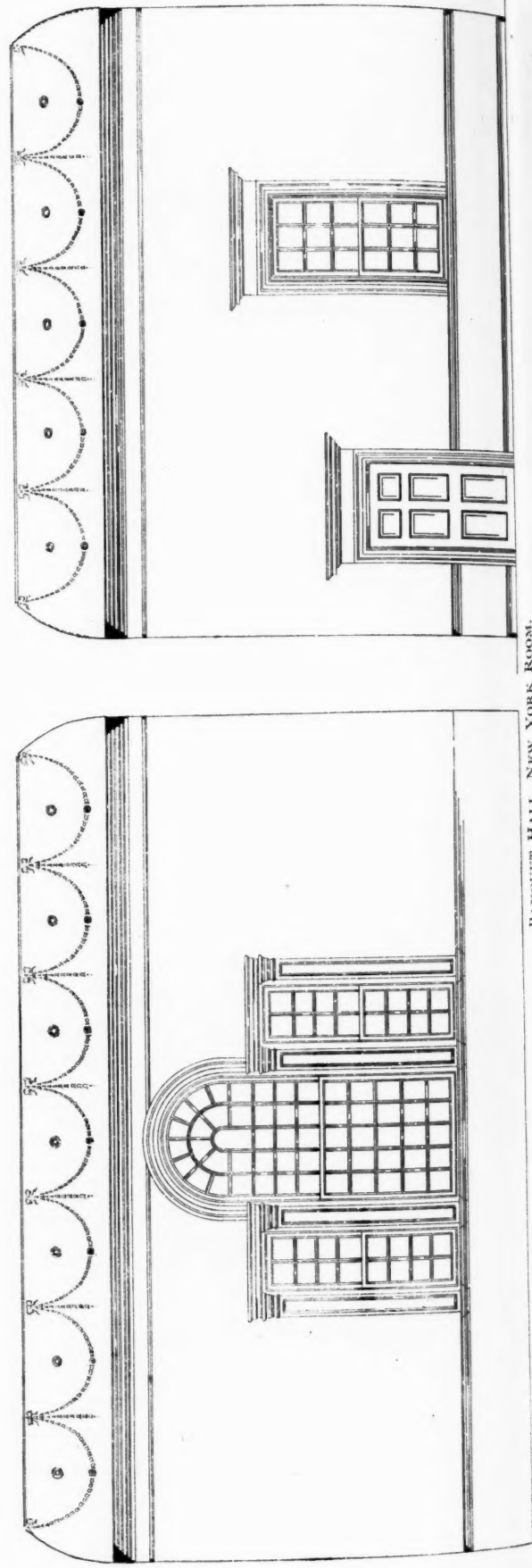
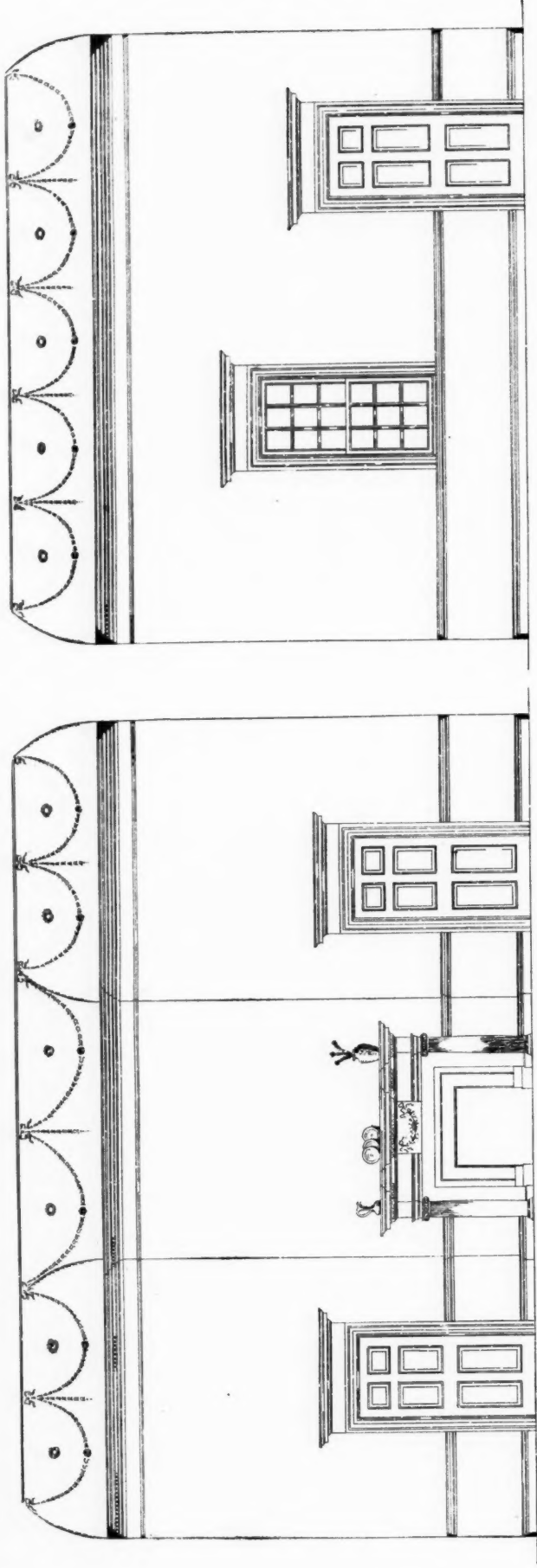
Bed Room & Bath Room to Attic



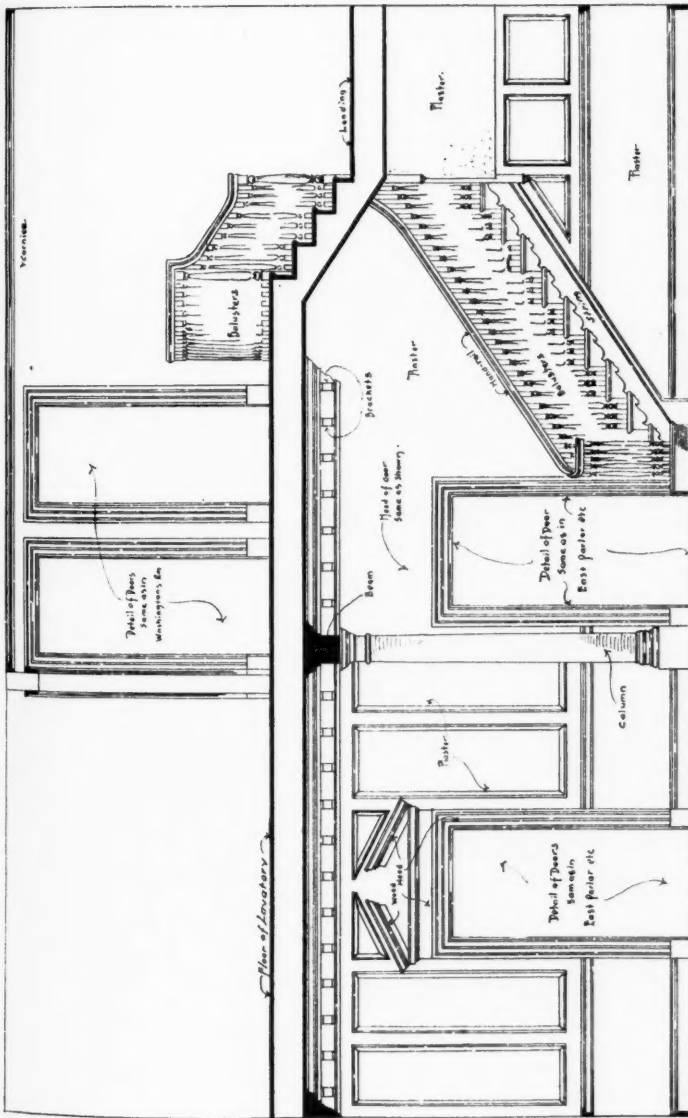


ROW OF RESIDENCES, CHICAGO.
BURNHAM & ROOT, ARCHITECTS.

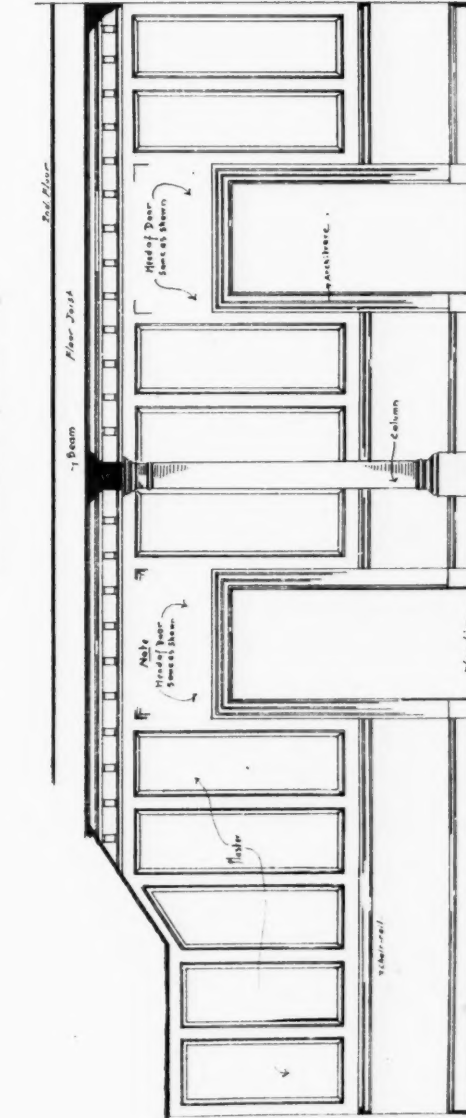
INLAND ARCHITECT PRESS.



BANQUET HALL, NEW YORK ROOM.



Side Elevation of Stairway



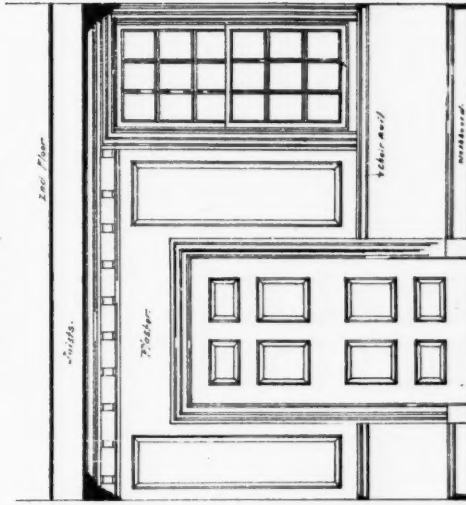
Side Elevation.

MAIN HALL.

DETAILS OF THE HOME OF WASHINGTON, MOUNT VERNON, VIRGINIA.

Reproduced for Virginia State Building, at World's Columbian Exposition, Chicago. From measured drawings by EDGERTON S. ROGERS, Architect, Richmond, Virginia.

Front View of Stairs.



Elevation towards Front Door.

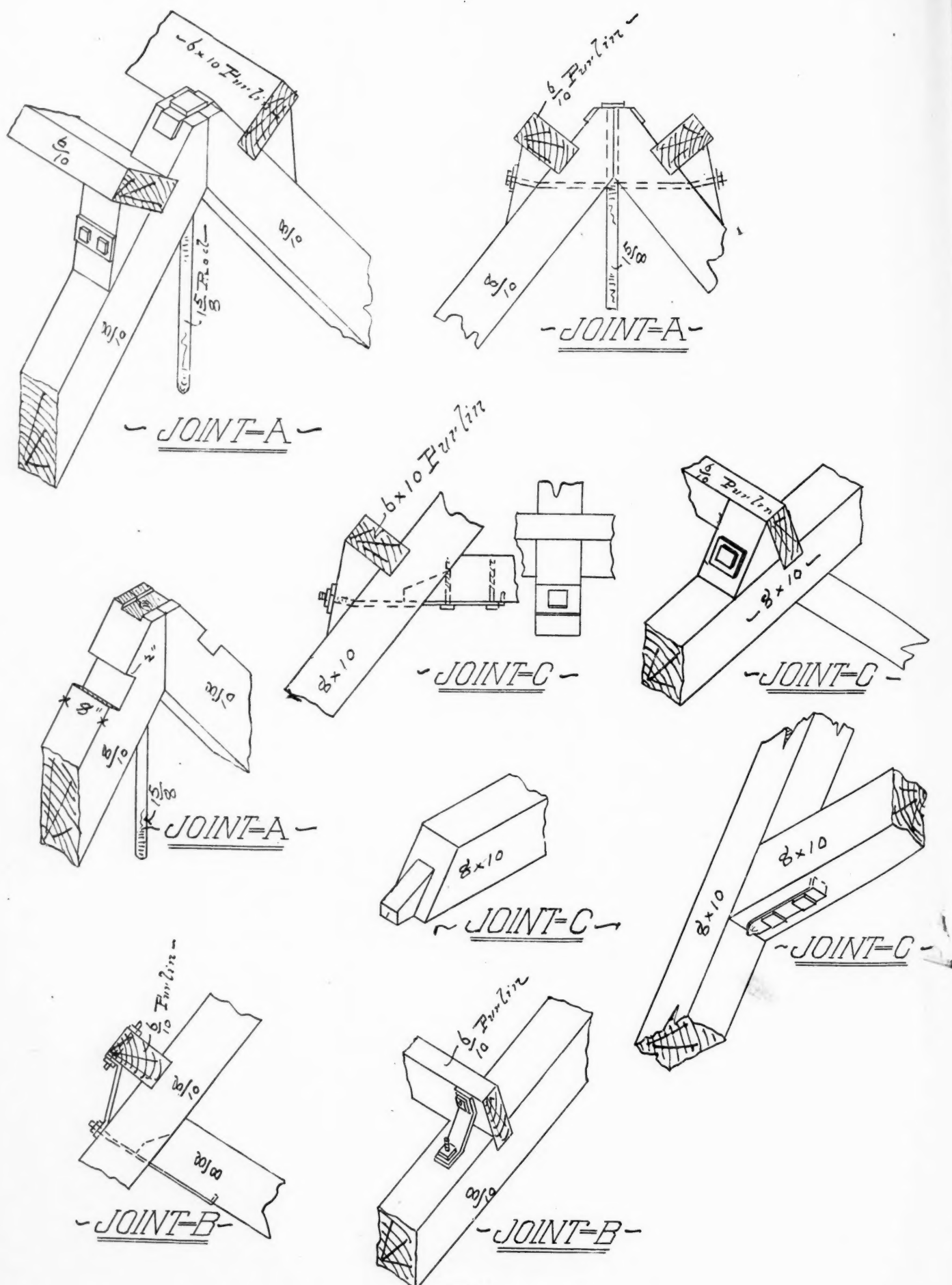


FIG. 68.

DIAGRAMS ILLUSTRATING "DIRECT METHODS IN ARCHITECTURAL PERSPECTIVE"

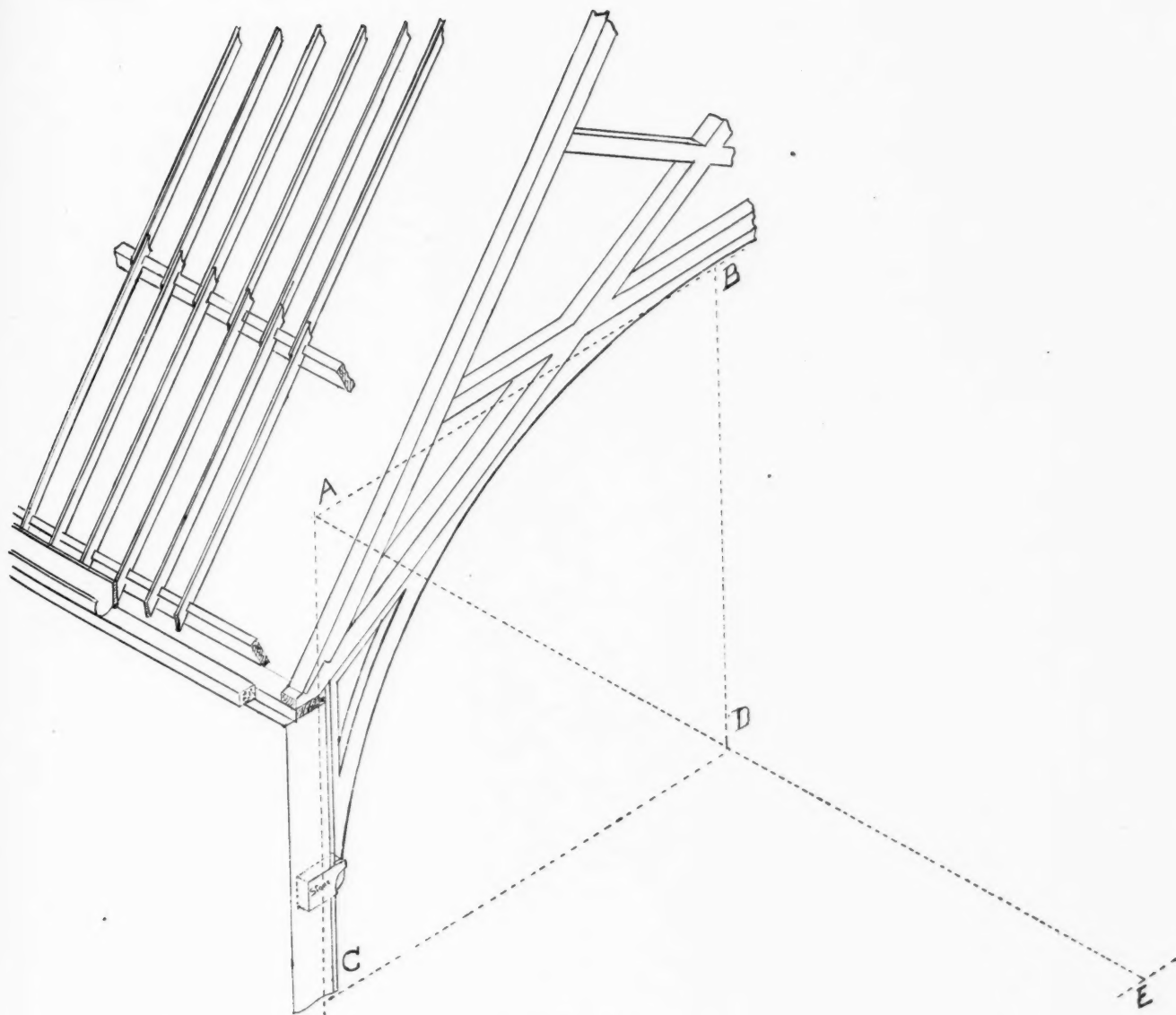


FIG. 73.

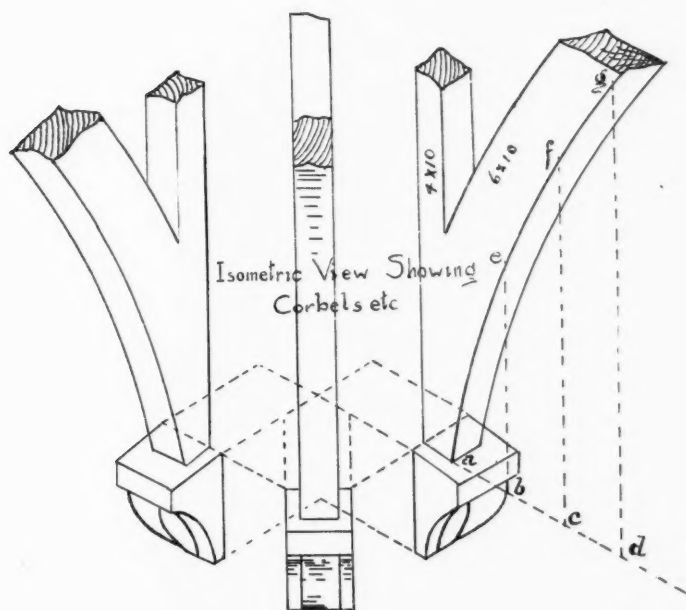


FIG. 76.

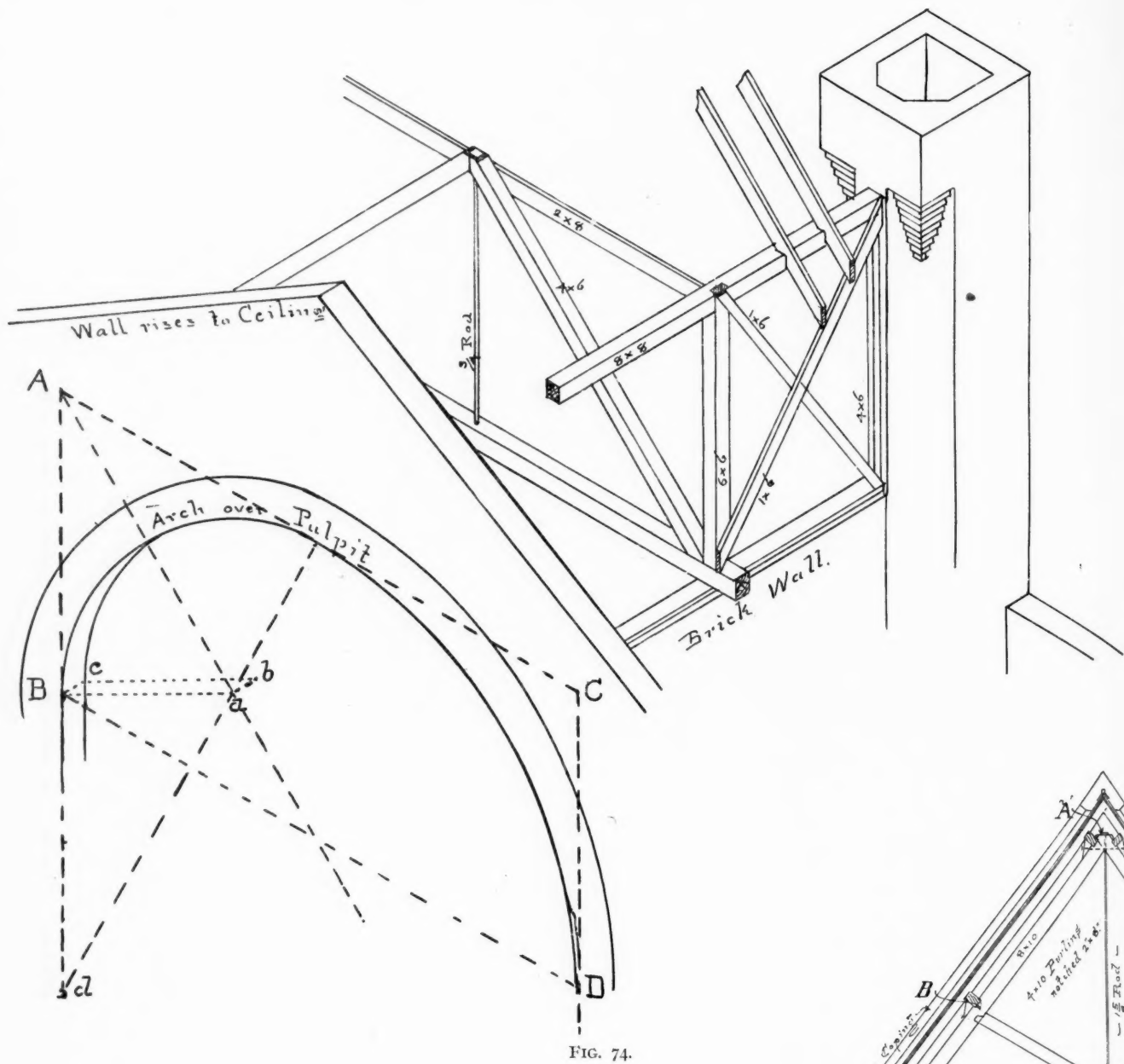


FIG. 74.

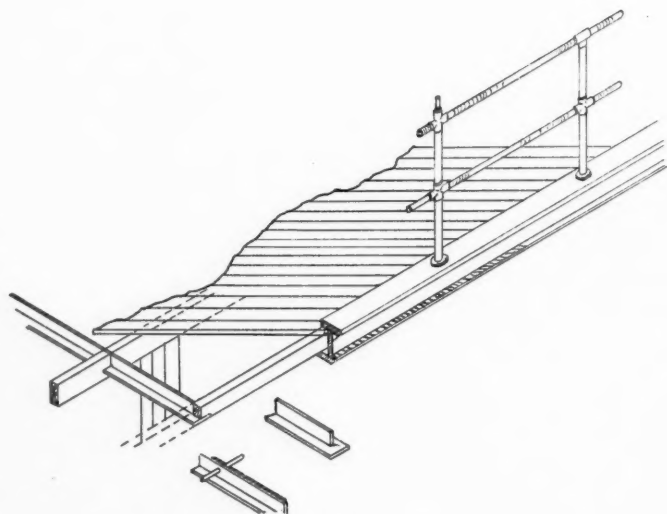


FIG. 70.

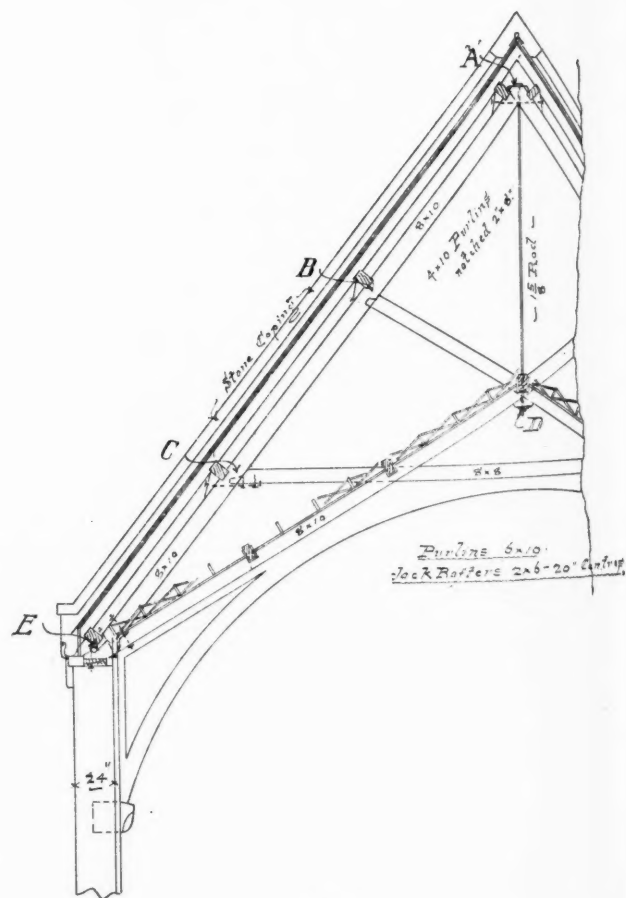


FIG. 69.

DIAGRAMS ILLUSTRATING "DIRECT METHODS IN ARCHITECTURAL PERS

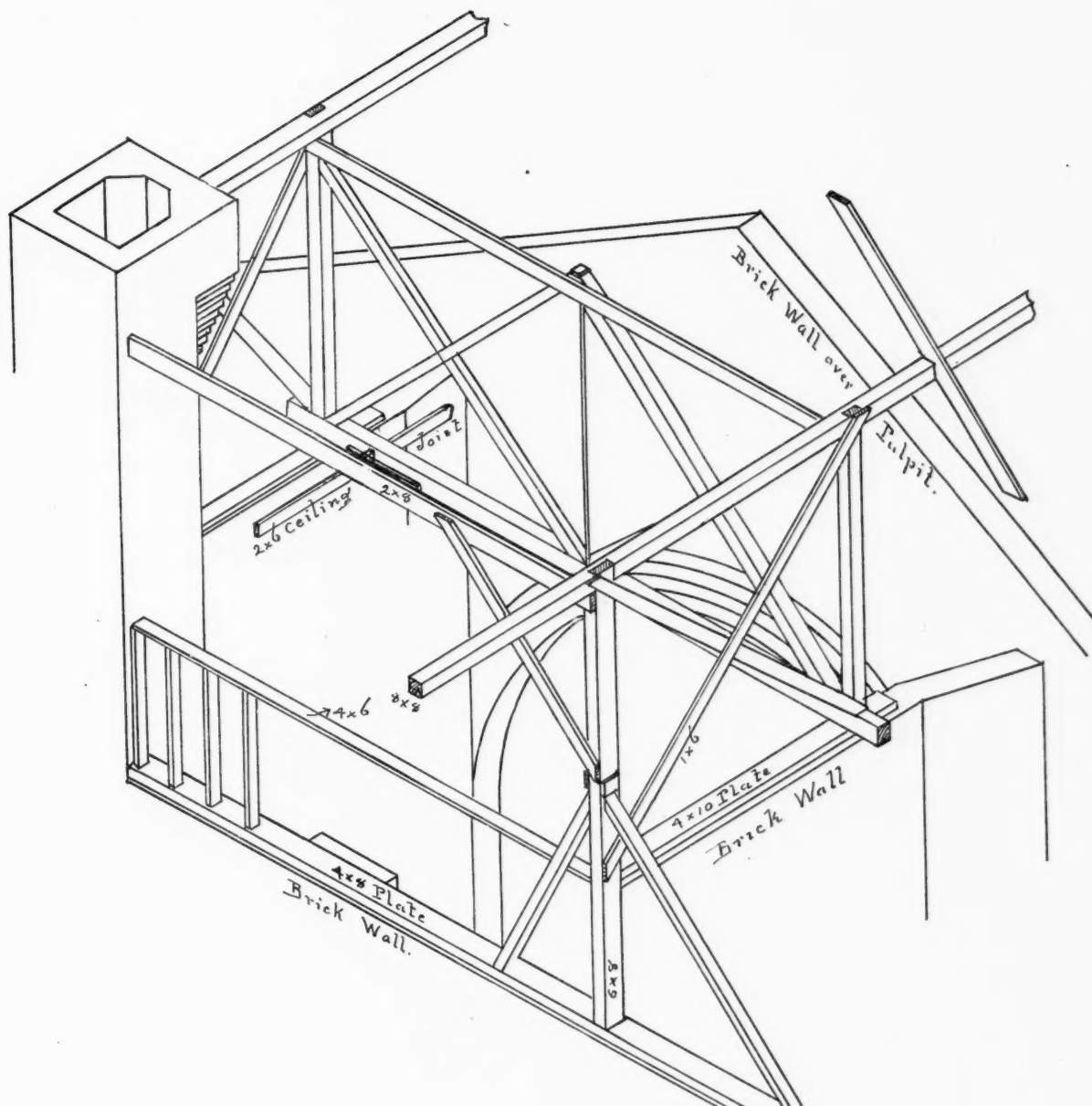


FIG. 75.

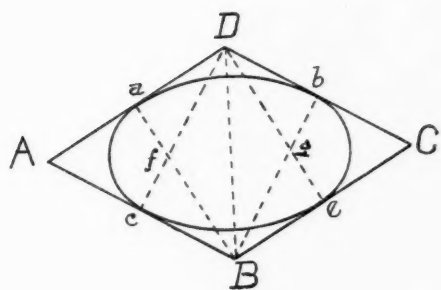


FIG. 71.

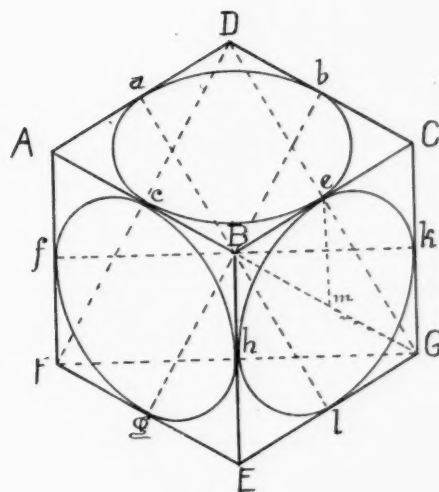
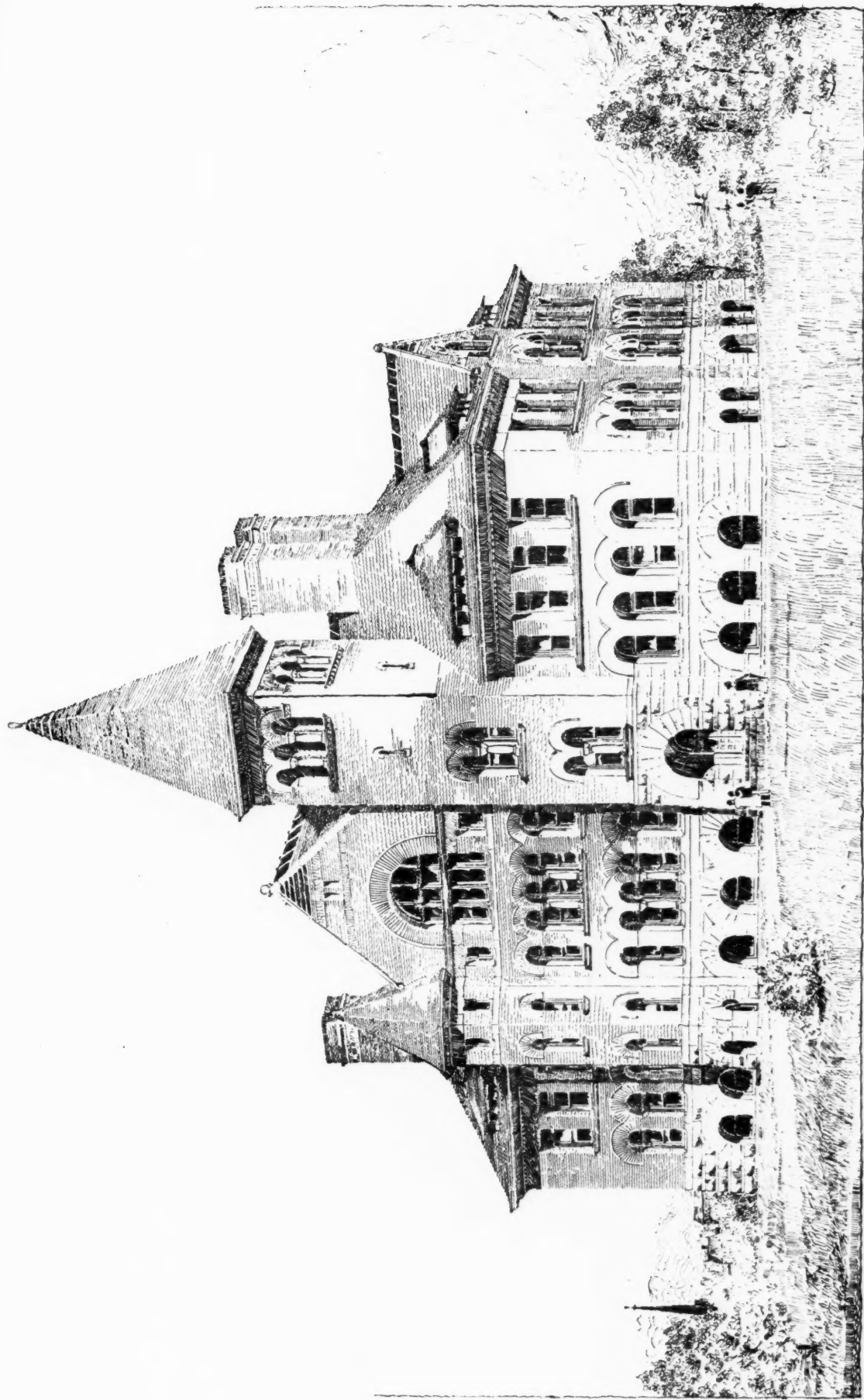
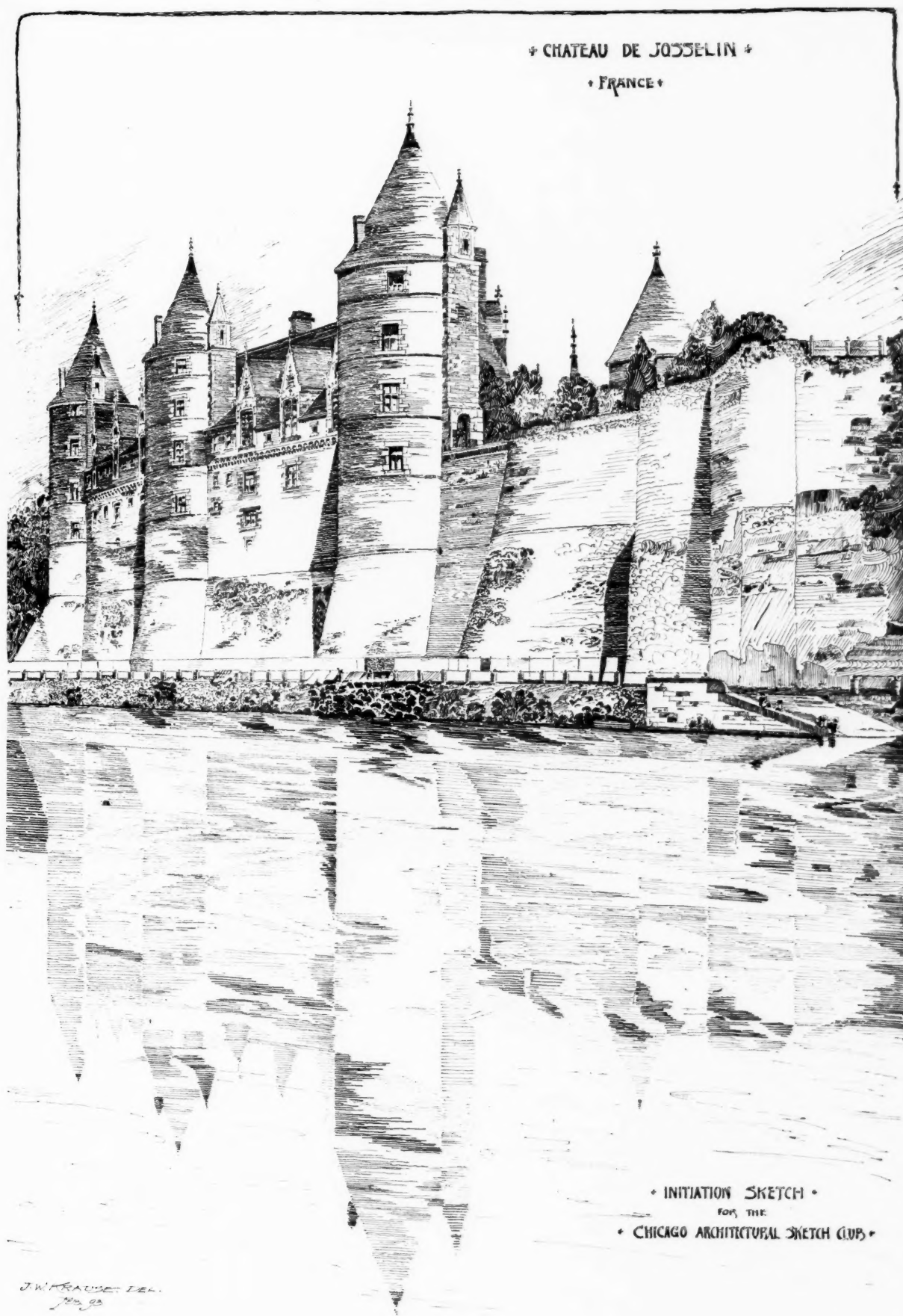


FIG. 72.



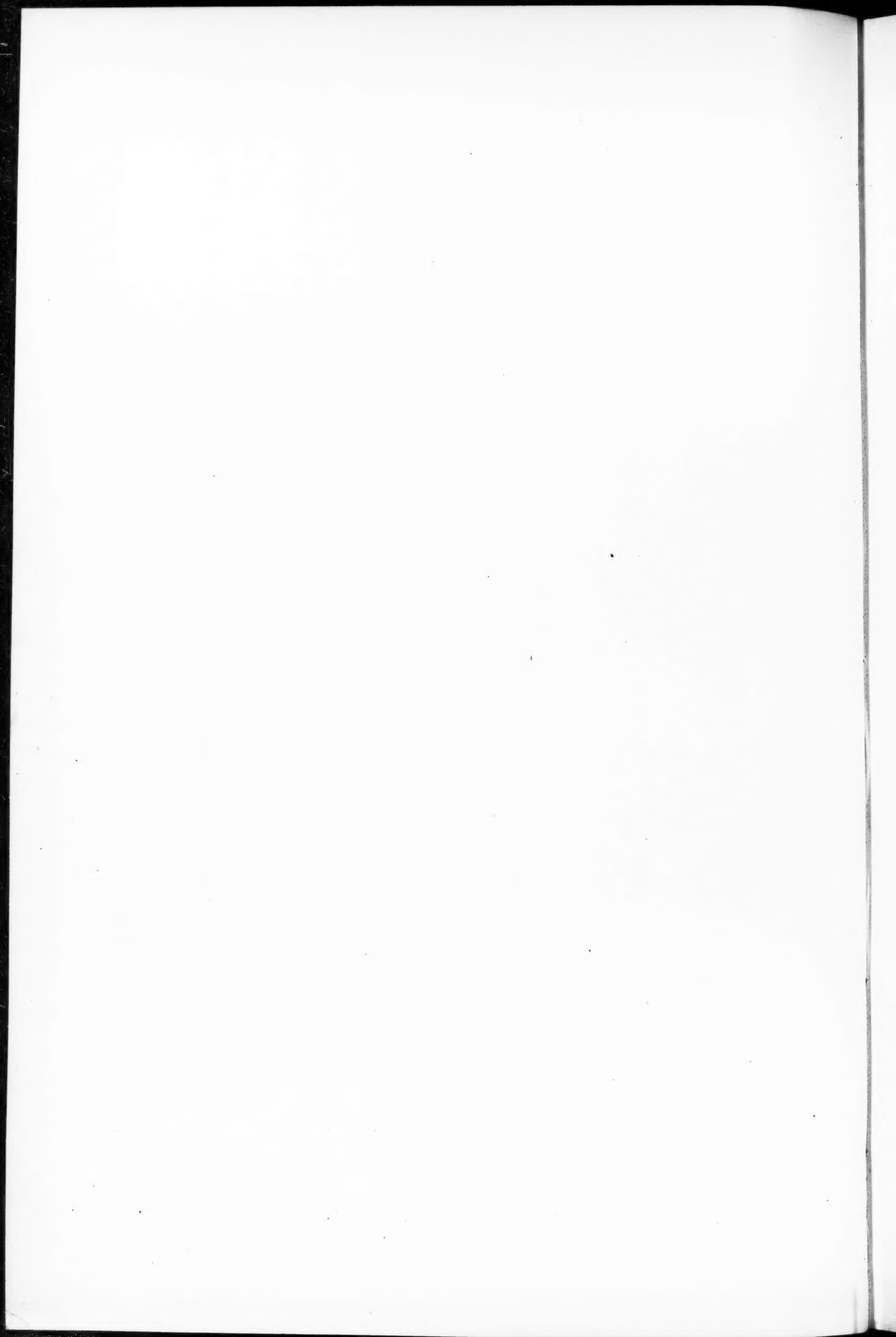
HIGH SCHOOL AT MUSKEGON MICHIGAN. * * PATTON AND FISHER. ARCHITECTS. CHICAGO. *





THE GESU, MILWAUKEE, WISCONSIN.

H. C. KOCH & CO., ARCHITECTS.





DECORATIVE GLASS WINDOW—A ROMAN CHARIOT RACE.

The exhibit of GEORGE E. ANDROVETTE & CO., Chicago, at the World's Columbian Exposition.