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THE contest between the New York walking-delegates and the Employers' Association is the most vigorous one that the city has ever witnessed. The employers seem to be in earnest, and it is probable that, before peace is made, the cardinal principle of the unions, that none but union men shall be employed, will have to be abandoned, probably forever. It is estimated that, through the determination of the brick and lumber dealers to resist the "unionizing" of their establishments, nearly two hundred thousand building workmen are now idle in New York and Brooklyn, and are losing in wages nearly five million dollars a week. Of course, it is impossible to collect from other unions "strike pay" to such an extent as this, and even the "strike funds" of the unions themselves cannot last many weeks; so that, for the first time in many years, the union men will pay the cost of fighting out of their own pockets. Meanwhile, the architectural iron-workers, whose men struck a few days ago, have issued a joint circular, announcing that such of their men as desire to come back to work will be received until June 1, but that after that date their places will be filled by others. The Board of Walking-delegates is said to propose to "present a united front" to the employers, but a "united front" does not, under the present circumstances, take the place of a comfortable home and three meals a day; and it is safe to say that it will not long remain united, although frantic efforts will, of course, be made by the leaders to keep it so.

IT seems not impossible that the permanent abolition of the compulsory employment of union men in the building trades, which is likely to be the outcome of the present struggle, may be followed by a discrimination against union men. One large factory, whose men recently listened to the blandishments of an agitator, and formed a union, is likely to be permanently closed in consequence, its owners saying that, having operated the factory for some years without profit, for the sake of keeping their men employed, they are not disposed to keep it in operation for the benefit of treacherous enemies; and, in view of the way in which the unions have exercised the power which combination and political influence gave them, it is not surprising that the employers, if they see a prospect of emancipation before them, will be disposed to make sure of their victory by destroying the means of resistance. The newspapers have a good deal to say about the impropriety of discriminating against union men, and the right of every man to join such associations as he pleases, but the right of a man to join any association that he likes does not imply that his employer should be compelled to keep him if he joins an association which the employer believes to be disposed to injure his business. Forty years ago it would have been injudicious, to say the least, for the Union generals to make confidants of men who wore the Confederate uniform; and, until a union card means something better than systematic shirking, arrogance and unfaithfulness, employers have a perfect right to exclude those who hold it from their establishments.

AN illustration of the way in which union methods interfere with legitimate business, and waste the money of the community, is to be found in the account of the strike at the Hecla Ironworks. This is one of the largest concerns in the country, employing about four thousand men. Its manager has been for many years noted as a sincere and energetic friend of workingmen, and, in addition to carrying on the business with the enlightened judgment which is the best reliance of the men employed, he has for several years maintained a system by which the men shared in its profits. Not long ago the Company had to carry out a small contract, for the erection of a little shelter, of iron and glass, over a door. It is one of the absurd rules of the unions that in such a case the standards must be set up by the members of the Structural Ironworkers' Union, and the ornamental iron must be put on by members of the Architectural Ironworkers' Union. The contractors, with their usual foresight, knowing these rules, had plenty of men of both sorts on hand, and the canopy was put up very rapidly, but in strict accordance with the union rules. The next day a walking-delegate appeared. He was surprised to see the work done, and concluded that, in order to get it completed so quickly, one set of men must have done the whole. He did not even condescend to make inquiries of his own men, who were still engaged on other portions of the building, and could have told him what had been done, but simply blew a whistle, the signal for a general strike, and all the men left the building accordingly. It is hardly necessary to say that so mighty a personage as a walking-delegate would not degrade himself by making any explanations to an employer, and it was two weeks before the officials of the Hecla Company could discover what the strike was ordered for. They then requested an interview with the walking-delegate, and told him how the work had been done. He probably knew all about it long before, for he admitted that he had made a mistake. Then the Hecla officials meekly asked him if he would not permit his men to go back to work. In response he swore that not a man should go back until all the men whom he had ordered to strike, without any reason whatever, had been paid full wages for the time that they had been idle. This amounted to the substantial sum of six thousand dollars, and the Hecla Company declined to pay it. The strike was therefore continued, and the Hecla Company finally compromised by paying over twenty-five hundred dollars. This, with various similar occurrences, at last convinced the Hecla officials that, as they said, a man could not be a partner in a concern and a striker against it at the same time, and they gave notice of the abrogation of the profit-sharing plan, following this, after a few more experiences, by closing their works altogether. When they reopen them, the prospect is that it will be with non-union men.

THE associations of employers to resist the insolent tyranny of trade-unions are meeting with rather unexpected success. In Denver, only a few days were needed to bring about the complete defeat of the union tyrants and the signing of an agreement, conceding the cardinal point, the free and unopposed employment of non-union men. In New York, the nervousness of the union leaders has already begun to show itself by various manœuvres. It is usual for these gentlemen to fly at once, in their troubles, to the politicians, with whom they take care to be in "harmony," but the plea on which they now appeal for aid is so curious in its impudence that it deserves recording. According to them, they have discovered that the association of employers has been formed for the purpose of "stultifying competition." Probably what they mean is that it is for stifling competition, but a trifle of grammar does not stand in their way. Under the New York laws, a combination among bidders for public work, for the purpose of preventing legitimate competition, and raising the cost of the work, is illegal, and the labor magnates hope, apparently, to make somebody think that Mr. Eidlitz, Mr. Getty, Mr. Prince and the other influential members of the new association are engaged in such tricks. The peculiar part of the matter is, however, that for many years the union magnates have been engaged in combinations for "stultifying competition," and raising the cost of work, both public and private, and have used, in pursuit of this object, every kind of treachery and

violence that they could think of; so that their appeal to the politicians to suppress an alleged attempt of the Employers' Association to do the same thing is little short of ridiculous.

THE newspapers inform us that Cornell University has established an alternative course in architecture, leading to the degree of Bachelor of Architecture, from which physics, chemistry, geology and botany, and the higher mathematics, are excluded; the change being made in pursuance of the belief of the Trustees that some students will receive greater benefit from devoting the time thus saved to practice in design than in application to uncongenial science. While there is something to be said in favor of this view, it is very easy to give it too much weight. All the half-educated and irresponsible draughtsmen who swarm in architects' offices hold this theory, and point to the Paris School of Fine-Arts, in which, as they imagine, none of the disagreeable sciences are taught, as an example to support it. As a matter of fact, certain forms of mathematics, as, for instance, descriptive geometry, are taught very thoroughly to all young architects in France, and the "*architecte diplômé*," who corresponds to our university graduate in architecture, is an accomplished man of science, as well as an artist; but it is true that physics and geology do not form a part of the ordinary Beaux-Arts curriculum, and the profession in France has many occasions for repenting the fact. In this country, where novel problems in construction present themselves every day, a knowledge of physics, chemistry and other natural sciences is of immense value to the practising architect, and serves, more than anything else, to distinguish him from the mere draughtsman, whose professional success is, in general, fatally circumscribed for want of it. We should be the last to deprecate the study of design by architects, but skill and individuality in design can be, and usually are, gained by actual practice, after the university training is over, while it is hopeless, after the university period is closed, for a young man to try to supply defects in his scientific education. Moreover, the lives of nearly all great architects show us that a mathematical training was a part of their artistic, as well as their scientific education. The mental processes involved in arriving at the solution of an architectural problem, whether in design or construction, are singularly similar to those involved in the higher mathematics, and the power of concentrating the attention, or mental training, as it is called, which is acknowledged to be the chief advantage gained by the study of mathematics, is, of all qualities, the most valuable to the practising architect. Ever since schools of architecture were established in this country, there has been a constant pressure upon them for the admission, not to their privileges, for the most important of these is the opportunity which they offer for hard work, but to the professional standing which they give, of students without the energy or mental capacity requisite for going through with the regular curriculum. In most cases, this demand has been met by the establishment of two-year special courses, which have been carefully separated from those leading to a degree. As now guarded in most of the great schools, these special courses have been very useful to individuals, and probably, on the whole, to the profession; but anything like an extension of the usual special course, and the elevation of it to a preparation for a degree, should, as it seems to us, be entered upon, in this country, with great caution.

MR. JEROME D. GREENE, secretary to President Eliot, of Harvard University, makes a novel suggestion for the new City-hall, which a great many people assume is soon to be built in Boston. The Public Garden site, so often proposed, is not likely to be adopted, on account of the general opposition to the sacrifice of the Garden; but Mr. Greene observes, very sensibly, that the artistic advantage of having the new building in the axis of Commonwealth Avenue could just as well be secured, and at a very insignificant sacrifice, by setting the City-hall in the middle of Charles Street, between the Public Garden and the Common, and carrying a roadway around it on two sides, taken partly from the Public Garden, and partly from the Common. This site would have the economical advantage of costing nothing, since all the land is already public property; and it would take for the new roadways only a little of the least attractive portions, both of the Common and the Public Garden; while it would give the building a very large area of open land around it, at the same time that, while closing the vista through Commonwealth Avenue, it would have in front of it the entire area of the present Public

Garden. As the traffic on Charles Street is not very important, its deflection at the building is a matter of little moment, and it would be hard to find in Boston a site more beautiful and dignified than this might be made.

THE St. Louis Manufacturers' Association sends through us an invitation to the manufacturers among our patrons to avail themselves, while in St. Louis during or before the Exposition of next year, of the facilities which the Association affords for making their stay in the city pleasant and profitable. St. Louis is now one of the most important manufacturing cities in the United States, and many of our readers and advertisers will, undoubtedly, be glad to avail themselves of the invitation. The offices of the Association are in the Merchants' Exchange Building, corner of Third and Pine streets; and any inquiries may be addressed to the Secretary at that place.

THE editor of *La Construction Moderne* has evidently been reading Herodotus, and has applied his mathematical mind to some of the things that he has read, with interesting results. Speaking of the city of Babylon, Herodotus gives the dimensions, inside the walls, which show that it was a little more than six times the size of Paris. Although the houses in Babylon were, as a rule, only three or four stories high, it is probable that the streets, the aggregate length of which, within the walls, was nearly two thousand miles, were narrow, as streets in Oriental cities always are, to this day, so that the city may have contained as large a population, in proportion to its area, as Paris, only one-third of which is covered with buildings. As the population of Paris is something more than three million, this would give for Babylon a population of eighteen millions. It is difficult to believe that it could have been so great as this; but, in any case, it must have been an enormous city. Besides the walls, three hundred feet high, which surrounded the town, two smaller walls were built, parallel to the river which traversed the city, and at a little distance from the bank. At the intersection of each of the transverse streets with these interior walls was a bronze gate; so that, according to the story of Herodotus, there must have been two hundred small bronze gates in these walls, in addition to one hundred large ones in the outer walls. The city, by means of these walls, really constituted two walled cities, one on each side of the river. It became desirable, during the reign of Queen Nitocris, to connect the two by a bridge, and Herodotus gives an account of the building operations, saying that the Queen's engineers began by digging an artificial basin, thirteen miles square, into which they turned the current of the river temporarily, while they built in its dry bed piers and abutments, upon which movable wooden platforms were subsequently laid; and he says that, to prevent thieves from crossing the river, these platforms were removed at night.

AS this story has been regarded as an absurd invention, M. Planat makes a little calculation, to see whether it is inherently improbable. There is no way of ascertaining the size of the Euphrates in the time of Nitocris; but M. Planat assumes it to have carried the same average amount of water through Babylon that the Seine does now through Paris. As Cyrus was able, with the labor of his soldiers, to divert the current of the Euphrates, the comparison with the Seine is probably more than fair. On this hypothesis the Euphrates would have flowed at the rate of about five hundred cubic yards a second. Supposing the artificial basin of Queen Nitocris to have been thirty feet deep, which is not unreasonable for a work of such magnitude, its capacity would be sufficient to accommodate the entire flow of the Euphrates for ninety-two days, a period amply sufficient for the erection of the piers for the new bridge. It appears that the Queen's engineers, after the bridge piers were built, and the river was turned back into its ordinary channel, utilized the basin as an overflow reservoir, to receive the surplus water in times of inundation. It will be observed that, according to M. Planat's theory, the Babylonian engineers were people of very considerable intelligence. The task of measuring the flow of the river, and of excavating a basin, in such a position that the water would flow into it by gravitation, just large enough to receive all the water for a time sufficiently long to enable the piers to be built, and situated conveniently for subsequent use as a flood reservoir, would not be a very simple one for a modern engineer, and the problem of disposing of four thousand million cubic yards of excavated material would not make it any easier.

NOTES ON IRON AND STEEL CONSTRUCTION.¹—XVII.

THE subject of the graphical analysis of stresses in roof-trusses will be concluded with such special solutions as involve trusses where the members are subjected to bending-stress, and trusses which institute horizontal reactions at the abutments.

In Figure 118 at (a) and (b) are shown the usual type of roof-trusses which require special solution from the fact that in each instance the main supporting member of the truss is subjected to great

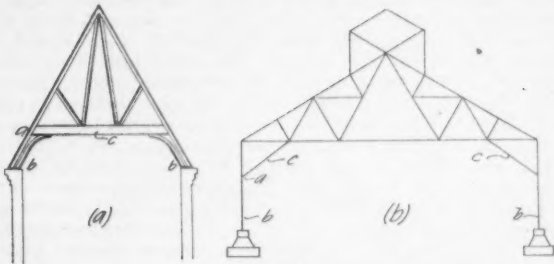


Fig. 118.

bending-stresses at the points *aa*. The skeleton diagram in the illustration at (b) shows the adaptation of a Fink truss for the support of a roof over a mill or train-shed. Columns *bb* are supported upon heavy piers, and the horizontal effect of the wind is resisted by the knee-braces marked *cc*. At (a) is shown a type of roof-truss frequently used for the support of the roof-covering of office-buildings where a Gothic treatment is desired. As ordinarily constructed, a tie-member would be introduced extending from *b* to *b*, but it is frequently desired to provide an assembly room or hall at the top of such buildings, when a high and vaulted-ceiling effect is desired. To accomplish the purpose the tie-member of the truss is raised and occupies the position shown by the member at *c*. The legs of the A-shaped truss thus formed become a combined steel column and girder subjected to direct compressive stress, and great bending at the point *a*, as previously described. In the analysis of trusses of this character it is manifestly impossible to introduce in the stress-diagram lines which will represent the bending-stresses, so that assumed forces must be introduced involving the same effect upon the frame in general; that is, as far as direct stresses are concerned, as would be instituted in the structure when the members are proportioned to withstand the bending-stress. In order to illustrate the principle of eliminating the bending-stress so that the frame can be analyzed by the usual graphical method, the attention is called to Figure 119. This represents a simple A-truss supporting the vertical load of 10,000 pounds, which is represented in the frame diagram by *bc*. From the fact that this load is centrally located, and that the truss is symmetrical about the centre line, the two reactions *R*₁ and *R*₂ are equal. Ordinarily these three forces would represent all of the external forces acting upon the truss, and the stress-diagram could immediately be drawn, but if the attempt were made, it would be found that the diagram could not be made to close. The reactions *R*₁ and *R*₂ are readily seen to produce bending about the point *c* and *c*₁, so this point is taken as the centre of moments. The moment about the point *c* is equal to the amount of the reaction *R*₁ multiplied by its leverage, or $5,000 \times 5 = 25,000$ foot-pounds. The rafter-member may now be regarded as of one piece throughout, from apex to heel, hinged at the point *c*, and acted upon with a moment about *c* produced by *R*₁. It is evident from the figure that this condition produces rotation about the upper end of the rafter-member in the direction of the arrow. It is also clear that a horizontal force, as *AB*, would resist this tendency of revolution; the

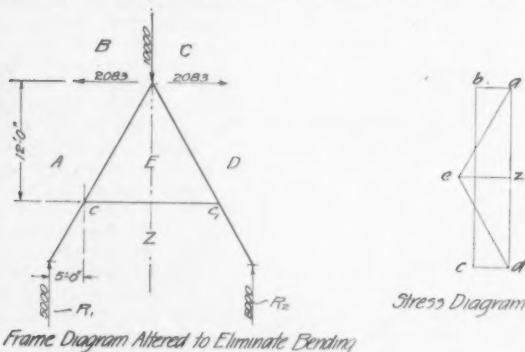


Fig. 119.

leverage of this force about the point *c* is 12 feet, hence, since the moment of *R*₁ about *c* is 25,000 foot-pounds, the amount of the force *AB* is equal to $25,000 \div 12 = 2,083$ pounds. There are, likewise, by the same reasoning, similar forces acting on the right-hand side of the truss, so that the frame can be considered as acted upon by the five external forces, and by inspection it is quite evident that

there is no motion vertically from the fact that all of the vertical forces balance, and that neither is there motion horizontally because all horizontal forces are equalized. The stress-diagram may be commenced by laying off the load-line *bc* equal in amount by scale to 10,000 pounds; *ab* is made equal to the force *AB*, and exists as designated in the frame diagram from *a* to *b*, or from right to left; *cd* is likewise drawn in the stress-diagram, and when the points *a* and *d* have thus been found, the reactions *R*₁ and *R*₂ are designated in the stress-diagram by the location of the point *z*, and these reactions extend from *z* to *a* and from *d* to *z*; the polygon of external forces will then be from *a* to *b*, from *b* to *c*, from *c* to *d*, from *d* to *z*, and from *z* back to *a*, the starting-point. To analyze the joint at the apex of the truss, draw from *a* an indefinite line parallel with *ae*, and from *d* a line parallel with *de*; either point of intersection will give the point *e*, and it is quite evident that, by connecting *e* and *z* already obtained, the line representing the stress in the member *ez* will be found in the diagram. In this manner is completed the stress-diagram. It is interesting to note the effect produced by assuming that the members *AZ* and *DZ* are incapable of resisting the bending-stress, and that a horizontal thrust is thrown upon the abutments. In Figure 120 is shown the frame diagram of the same truss, with the horizontal thrusts applied at the feet of the legs. The amount of these thrusts is equal to the moments about *c* and *c*₁, or $25,000 \div 8.5 = 2,941$. With the introduction of these two forces, which are designated in the frame diagram by *AB* and *DC*, the stress diagram may be drawn as shown, and it will be observed that in this diagram the points *e* and *z* coincide, so that the member *EZ* in the frame diagram is useless, for all of the horizontal component of the direct stress in the rafter-members is taken up by the thrusts at the feet of the leg. In Figure 121 is shown a somewhat similar frame supported upon steel columns, and provided with the knee-braces *kz* and *pz* to resist the lateral motion. The truss in this frame diagram is designated as loaded with wind-loads at each panel joint; they are *de*, *ef* and *fg*. The reactions may readily be figured by taking

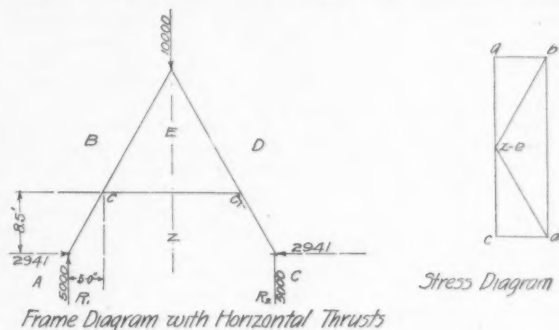


Fig. 120.

the moments about the point *c*₂. The calculations for these reactions are as follows:—

Moment of load *DE* = $1,000 \times 18 = 18,000$ foot-pounds.
Moment of load *EF* = $2,000 \times 9 = 18,000$ foot-pounds.
Sum of positive moments = 36,000 foot-pounds.

The lever-arm of the negative forces, or *R*₁, equals 27.5 feet, so that the amount of *R*₁ = $36,000 \div 27.5 = 1,306$; the sum of the loads is equal to 4,000 pounds; in consequence the reaction *R*₂ = $4,000 - 1,306 = 2,694$ pounds; but the reactions *R*₁ and *R*₂ produce great bending-moments in the columns at *c* and *c*₁, and it is advisable in determining these bending-moments to find the horizontal component of each of the reactions, the components of *R*₁ and *R*₂ being respectively equal to 675 pounds and 1,350 pounds, for they are the amounts determined by scaling the horizontal line in the triangle of forces at the foot of each column. The load *ab* acts about the point *c* with a lever-arm equal to 12.5 feet, and its moment, in consequence, about this point is 8,437 foot-pounds. It is quite evident that if the column is regarded as one continuous member hinged at the point *c*, *ab* will tend to revolve the upper end of the column in the direction shown by the arrow, so that an imaginary force, *cd*, must be applied at this point; the amount of this force *cd* is equal to the moment of *ab* about *c* divided by the leverage of force *cd*, which is 6 feet, and since the moment of *ab* about the point *c* equals 8,437 foot-pounds, the amount of *cd* will equal $8,437 \div 6 = 1,406$. By inspection of the frame diagram it will also be observed that the forces *AB* and *CD* tend to produce horizontal transitory motion and that they must be resisted by equal and opposing forces, and that this force must be applied at *CB*; the force *CB* is, in consequence, equal to the sum of *AB* and *CD*, or 2,081; the horizontal component of the reaction *R*₂ amounts to 1,350 pounds; its moment about the point *c*₁ is equal to 16,875; the leverage-arm of *gh* is the same as the leverage of *cd*, or 6 feet, so that the amount of the force *gh* is equal to $16,875 \div 6 = 2,812$; the counteracting force *hi* is equal to $1,350 + 2,812 = 4,162$; with the introduction of these horizontal forces all of the external forces upon the frame have been determined, and the stress-diagram may be drawn.

In drawing the stress-diagram, as is usual with all graphical solutions, the polygon of external forces must first be decided upon, *ab*

¹ Continued from No. 1427, page 37.

must be drawn in the stress-diagram to scale from a direction extending from left to right, as shown by the force AB in the frame diagram; bc is then laid off, a portion of it being coincident with ab in a direction parallel with the force BC in the frame diagram and extending, as designated by that force, from right to left, the point c being thus located; the point d is found to coincide with the

point a , for, as known from the frame diagram, the sum of the lengths of the lines cd and ab must equal cb ; d being thus located, the panel-loads de , ef and fg can be marked off in the direction shown; gh is now described in a direction from left to right, and hi being measured off to give the stress by scale equal to the force HI locates the point i ; j falls on the point g , as a fell on the point d in the upper portion of the diagram. The polygon of external forces about the truss will then read, commencing at the left-hand column foot,

from a to b , from b to c , from c to d , from d to e , from e to f , from f to g , from g to h , from h to i , from i to j , from j to z and from z returning along the line representing the reaction R_1 to the point a . Commencing at the joint at the frame diagram $CKZB$, draw vertically the line ck parallel with the member so marked in the frame diagram, and from z extend a line parallel with kz , their intersection locating the point k . The line el is now drawn in the stress-diagram and the point l obtained by drawing from k the line kl parallel with the member marked LK in the frame diagram. The joint $EFML$ offers no difficulty of solution, and the polygon of forces about this joint extends from e to f , from f to m , from m to l . The next joint to solve, $L MN Z K$, is solved by drawing from the point m in the stress-diagram a parallel line with the member MN ; this, from a peculiarity of the frame, falls at the point z , so that n coincides with this point, and there is no stress in the member NZ .

By inspection of the frame diagram this is readily explained from the fact that the line of action of R_2 coincides with the line of action of the member ON , so that the left-hand portion of the truss may be considered as supported upon a cantilever, as shown section-lined, by the strut no . By further solution of the diagram the point p is found to coincide with h , and o with j and g ; there is, in consequence, no stress in the member go , and neither is there direct stress in the member hp . It will also be observed that the amount of stress in the member ON is equal to the amount of the reaction R_2 , and is represented in the stress-diagram by on or jz . It may at first seem peculiar that no stress exists in the member PH , but the section-lined space must be regarded as bounded by a strut pz , held against moment at c_1 , and a tie-member, as OP , firmly secured at c_2 .

The problem shown in Figure 122 is one of the most complicated graphical solutions of stresses to be encountered. The frame diagram shows the structural framework for a mill-building or trainshed. The vertical-load diagram for this frame offers no difficulty, from the fact that, when symmetrical theoretically, the knee-braces designated by oz and $7z$ are not subjected to any stress. With the wind acting upon one side of the frame, the columns represented by the members AZ and ZN are subjected to great bending-stress at the points c_1 and c_2 . These bending-stresses are to be equalized by the method

described in connection with Figure 121; but the problem is much more complex on account of the numerous members in the frame, and from the fact that the wind acts horizontally upon the vertical surfaces as well as obliquely upon the slope of the roof. The wind-stresses acting upon the frame are represented by the similar horizontal forces AB and BC , and the horizontal forces acting upon

the side of the monitor which are designated by GH and IJ . The oblique forces upon the frame are considered as rigidly fixed to adequate foundations, in which case the reaction at the foot of each column due to the oblique forces coincides with the direction of these forces, but the horizontal forces acting upon the side of the building and the side of the monitor tend to overturn the structure about the point c_2 , in effect to lift the leg of

the column at the point c_2 . The reactions created by these horizontal forces are vertical and equal at the foot of each column. The vertical reaction at the foot of the right-hand column exerts its force upward, tending to create additional compression in the leeward column, while the vertical reaction at the left-hand column is downward, tending to create tension in the windward column. The first feature of the solution consists in the determination of the reactions coincident with the direction of the oblique forces, and the vertical reactions at the foot of each column. These reactions are shown in the frame diagram by the light oblique lines, and are marked at the left-hand foot of the truss R_1 and R_2 , while at the right-hand foot of the truss they are designated by R_3 and R_4 . In figuring these reactions the moments of all the forces upon the truss will be considered about the point c_2 as the centre of moments. The moments of the oblique forces are as follows:—

Moment of CD	$= 1,000 \times 15$	$= 15,000$ foot-pounds.
Moment of DE	$= 2,000 \times 24.5$	$= 49,000$ foot-pounds.
Moment of EG	$= 2,000 \times 36$	$= 72,000$ foot-pounds.
Moment of HI	$= 1,000 \times 47.5$	$= 47,500$ foot-pounds.
Moment of JK	$= 1,000 \times 53.5$	$= 53,500$ foot-pounds.
Moment of KL	$= 1,000 \times 65$	$= 65,000$ foot-pounds.

Sum of moments of oblique forces $= 302,000$ foot-pounds.

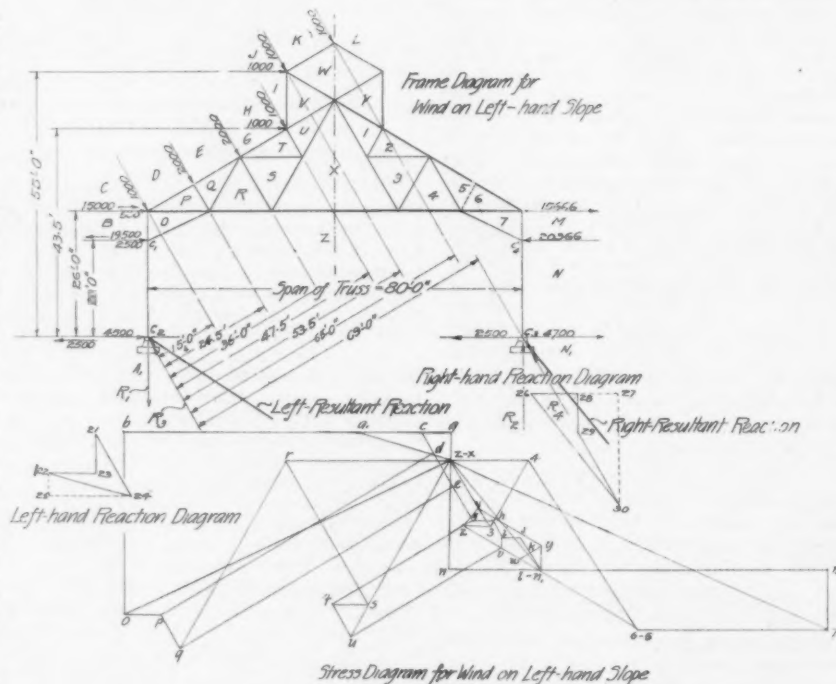


Fig. 122.

Moment of AB	$= 2,500 \times 20$	$= 50,000$ foot-pounds.
Moment of BC	$= 500 \times 26$	$= 13,000$ foot-pounds.
Moment of GH	$= 1,000 \times 43.5$	$= 43,500$ foot-pounds.
Moment of IJ	$= 1,000 \times 55$	$= 55,000$ foot-pounds.
The sum of the moments due to the horizontal forces $= 161,500$ foot-pounds.		

The lever-arm of the reaction R_1 at the right-hand column foot is 69 feet, so that the amount of this reaction is equal to $302,000 \div 69 = 4,380$ pounds; the sum of the oblique forces acting upon the truss is 8,000 pounds, and in consequence the left-hand oblique reaction, or R_2 , is equal to 8,000 — 4,380 pounds, or 3,620 pounds. The moment of the horizontal wind-forces may be expressed in the following tabulation:—

The leverage of the vertical reaction R_2 is equal to the span of the truss, or 80 feet, so that the amount of this reaction is found by dividing 161,500 pounds by 80 feet, which gives approximately 2,018 pounds. The tension in the windward column must be equal to this force, from the fact that all of the vertical components acting upon the truss must equalize each other, so that R_1 is likewise 2,018 pounds. Three reacting forces have now been determined for the foot of each column; they are, oblique forces coinciding in direction with the action of the wind-loads upon the sloping portion of the roof; the horizontal effect due to the wind acting upon the vertical portions of the structure; and a vertical force which is created by the horizontal forces acting upon the vertical surfaces, tending to overturn the frame. These three forces being determined at the foot of each truss, it is advisable before attempting the stress-diagram, to first draw the reaction diagrams as shown in the figure. The right-hand reaction diagram is described by laying off the stress 30-29, equal to 4,380 pounds; then by drawing the vertical line 29-28 equal to the vertical reaction, or 2,018 pounds; the horizontal force 28-26 is now drawn equal in amount to 2,500 pounds, which is one-half of the sum of the wind-pressures at the several panel points acting upon the vertical portions of the frame. By connecting the points 26 and 30 the resultant reaction at the left-hand foot of the truss is determined. In a similar manner the left-hand diagram is described, and

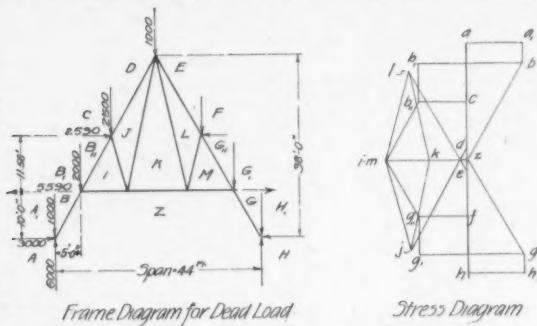


Fig. 123.

the final resultant, represented by the line 22-24, determined. When both of these resultant reactions have been found in this manner they may be analyzed into their components; the horizontal and vertical components of the right-hand reaction are represented respectively by the lines 26-27 and 27-30, while the components of the left-hand resultant reaction are designated by the vertical lines 22-25 and 25-24. Considering the right-hand reaction diagram, assume that the foot of the right-hand column is acted upon by only the horizontal force 26-27 and the vertical force 37-30; it is evident that the vertical force can create nothing but direct stress in the leeward column; but that great bending-moment is instituted by the horizontal component 26-27. The amount of the horizontal component is found by measurement to equal 4,700 pounds; the moment of this force about the point c_2 divided by the distance between the line of action of the force NM and ML will give the amount of the force ML , which is 15,666 pounds; the amount of the force MN is equal to the sum of the forces ML and NN_1 , or 20,366 pounds. These forces, when introduced into the frame diagram, eliminate the bending-moment upon the leeward column, and yet do not destroy either the equilibrium of the structure or the equilibrium of the several joints. These forces having been determined, the external forces about the joints upon the leeward column are $L M$, $M N$, $N N_1$, and $N_1 Z$, or the resultant reaction. Considering the left-hand end of the truss, the horizontal component of the resultant oblique reaction represented in the left-hand reaction diagram by the line 22-24 is equal to 4,500 pounds; from this horizontal component the force of 15,000 pounds at the joint CB is determined by taking moments about the point c_1 ; there the force at the joint AB , of 19,500 pounds, is equal to the sum of 15,000 and 4,500. By observing the frame diagram it will be noticed that the panel-load of 500 pounds at the joint BC coincides in its direction with the force of 15,000 pounds, so that the force BC is truly represented by 16,000 pounds. By inspection of the joint at AB it will likewise be observed that the panel-load of 2,500 pounds acts in opposition to the force AB , so that the actual amount of this force is 17,000 pounds; attention will likewise be called to the fact that the two horizontal forces at the foot of each truss, amounting to 2,500 pounds, have already been considered in the reaction diagram, so that they may not be considered in drawing the stress-diagram. Before commencing the stress-diagram it is nec-

essary to lay off the load-line, which represents the external forces about the truss. The load-line is drawn to scale from a_1 to a , equal to 4,500 pounds; from a to b , equal to 17,000 pounds; from b to c , equal to 15,500 pounds; from c to d , equal to 1,000 pounds; from d to e , equal to 2,000 pounds; from e to g , equal to 2,000 pounds; from g to h horizontally, equal to 1,000 pounds; obliquely from h to i , and again from i to j , each of these forces being made to equal 1,000 pounds; the

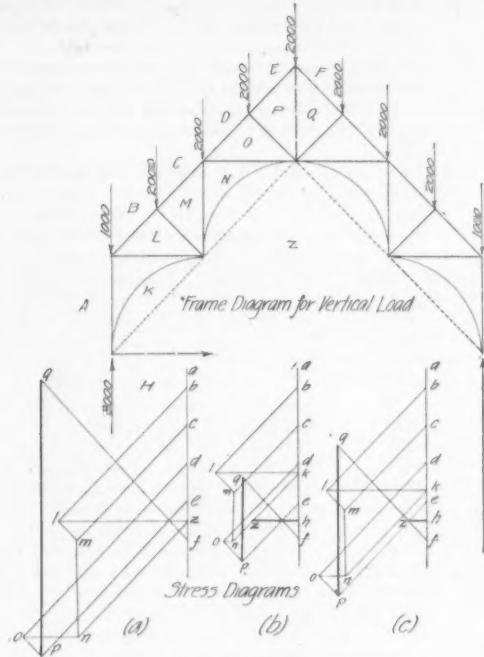


Fig. 125.

ten oblique forces jk and kl then follow; from l , lm is laid off equal to 15,666 pounds; then nn is made equal to 20,366; nn_1 is designated in the stress-diagram to scale by laying off an amount equal to 4,700 pounds; the oblique reaction, shown heavy, is now drawn parallel with 26-30 in the reaction diagram, and made equal in length to this line if the reaction diagrams and the stress-diagrams are laid off to the same scale. The point of commencement, or a_1 , is reached by drawing from z a line parallel with 22-24 in the left-hand reaction diagram; this completes the load-line, and no difficulty will be encountered in analyzing the stresses throughout the members of the truss. The analysis of stresses, from the fact that the truss is of the Fink type, will be halted at the joints EG or $RS \times Z$, but this difficulty is overcome by commencing about the upper joints, as KLW , and working the successive joints until one of the three unknown forces about the joints has been determined.

In Figure 123 is shown the analysis of stresses existing in an A-shaped frame from the vertical loads. The vertical loads, vertical reactions of 6,000 pounds at each end of the truss, and these reactions revolving about the connection of the leg with the frame, produce a moment equal to $6,000 \times 5$, or 30,000 foot-pounds. The horizontal force necessary to equal this bending stress is $A A_1$, which, since it acts from a lever-arm of 10 feet, is equal in amount to $30,000 \div 10$, or 3,000 pounds. Since the member B_1 may be regarded as a continuation of the leg of the truss, the force $B_1 C$ is calculated by dividing 30,000 foot-pounds by its lever-arm, or 1,156; the quotient will be, in consequence, equal to 2,590 pounds. To prevent the two forces $A A_1$ and $B_1 C$ from moving the truss horizontally, the force $B B_1$ must be assumed equal to the sum of 3,000 and 2,590, or 5,590. Besides the vertical loads these three forces just calculated will exist on each side of the truss, and the stress-diagram may be drawn after the load-line has been laid out. The load-line in this instance extends from a to a_1 , from a_1 to b , horizontally from b to b_1 , vertically from b_1 to b_{11} , again horizontally from b_{11} to c , from c to d vertically, in the same direction from d to e , continuing from e to f when the horizontal line $f'g$ is drawn to represent that force in the frame diagram. The next force is represented by the vertical line g_{11} , then horizontally from g_1 to g , from g to h_1 , from h_1 horizontally to h and from h representing the reaction r_{11} by $h z$ and from z back to a , the starting-point.

The wind-stress diagram for an A-truss is shown in Figure 124,

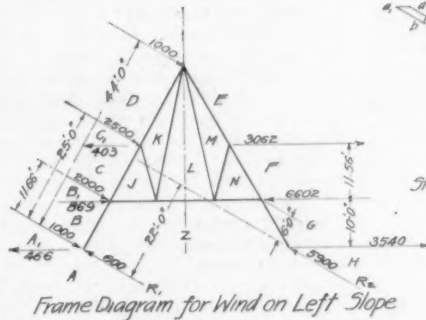


Fig. 124.

and when moments are taken about the right-hand foot of the truss the oblique reactions R_1 and R_{11} are found to equal respectively 600 and 5,900. These oblique reactions may be resolved into their horizontal components, which are represented at each end of the truss by $A A_1$ and by $G H$, their amounts being respectively equal to 466 and 3,540. These two forces produce bending about the connection of the leg with the truss, and the forces necessary to create equilibrium at the several joints and of the entire frame may be calculated as described for the several previous cases. The stress-diagram for this truss is readily drawn, as shown in the figure, when the necessary calculations have been made and the load-line laid out. It will be observed from this stress-diagram that all of the members are subjected to stress under the action of the oblique wind-pressures, and a combination of the stresses obtained in this diagram and the vertical-load diagram will give the maximum stresses in the several members of the truss.

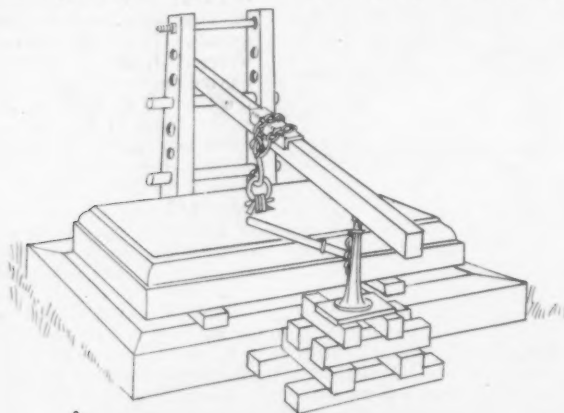
In Figure 125 is shown the frame diagram for a type of truss which is frequently used in church construction. This truss, while often constructed of timber, may readily be constructed of steel, though the steel members are frequently covered with wood to imitate massive timber construction. This type of truss, which is known as the "hammer beam" truss, is pleasing in appearance, and readily lends itself to architectural treatment. The truss is most economically designed when the abutments will withstand a considerable thrust. In drawing the stress-diagrams, the first diagram shown at (a) was drawn when the condition was assumed that there were no horizontal thrusts provided by the walls or abutments; all of the tendency for the truss to spread is prevented by the vertical member $P Q$, which divides the parallelogram at the apex panel of the truss into two triangles, and tying the opposite corners in such a manner as to prevent them spreading. A comparison of this stress-diagram with the stress-diagram at B , which is drawn to the same scale, shows the manner in which the stresses throughout the truss are materially decreased when a thrust such as $h z$ is introduced at the abutments. It will be noticed that the introduction of these two horizontal forces, which may be provided by heavier walls or buttresses, reduces the stress in the member $P Q$ several times. If a thrust as great as $C H$ cannot be provided by the abutments, a somewhat smaller thrust will make a material decrease in the stresses existing throughout the frame, as shown in the stress-diagram at c . It is far better, in a truss of this character, to provide some horizontal thrust, even though economy of design is not a consideration, from the fact that unless the truss is very carefully built there will be some slight give in the connections, which by distorting the truss will throw additional stress on some of the members. A peculiarity of the frame diagram exists in the fact that several of the members are curved, such as $N Z$. Where a curved member exists in a frame the practice is to introduce the chord of the member as shown by the dotted line, and to analyze the frame accordingly. By providing a tie between the joints $L M N Z$ and the same joint upon the opposite side of the truss, the same effect will be obtained in the stress-diagrams as though horizontal thrusts were provided at the abutments, that is, when the truss is subjected to vertical load. The stress-diagrams for this truss are readily drawn, from the information given in connection with the previous and more difficult problems, and from the information given throughout no difficulty should be encountered in determining the stresses in any roof-frame. In the next and final article the subject of practical design of roof-trusses in steel will be considered.

M. M. SLOAN.

[To be continued.]

SETTING HEAVY MONUMENTS WITHOUT THE USE OF A DERRICK.

WITH the growth and development of the monumental business there is an increasing demand for heavy work, and it is oftentimes a problem to know exactly how to be equipped to handle it without going to the expense of very costly appliances. A simple



but very effective apparatus for setting monuments without the use of a derrick can be constructed with very little expense in the following manner: the articles required for its construction being two

upright timbers, measuring $10' \times 8'' \times 8''$, a beam $8' \times 8'' \times 8''$, two high-power stone jacks with square lifting heads, one lewis iron, a strong derrick-chain with a large hook to fasten into the lewis iron and a small hook on the other end of the chain to hook into or around the links at any point; a heavy bolting-iron with stationary washers inside, exactly 18 inches apart and long enough to extend through the timbers and bolt on the outside; some solid-steel bars 2 inches in diameter to pass through holes $2\frac{1}{2}$ inches in diameter and which are bored in the upright timbers at intervals of about 8 inches; an iron plate about $\frac{1}{2}$ inch thick and 18 inches long to protect the beam from the cutting of the chain and to distribute the strain. Add to these plenty of good blocks, and you will be ready to tackle any size monument within the limits of transportation. In setting up this appliance the two timbers are set 18 inches apart and the bolting-bar firmly fixed through the top holes. If any great height has to be obtained, and one jack has run out its full length, the blocking must be so arranged that the other jack can be set in place and run out, one jack supporting the other in both raising and lowering; of course one jack and blocking can be used, but it will be found more economical to employ two. The 18-inch space between the upright beams will admit of any shifting of the chain-beam, to obtain centre and to bring the blocks into mitre. If the uprights are not of sufficient height to set a cap they can be raised on blocks and supported by guy-lines fixed to the top, and in setting any block where a lewis iron cannot be used a rope may be made to swing under the mouldings in exactly the same way as when using an ordinary derrick. By the shifting of the chain-beam either way as the occasion demands, one can, if the chain is hooked tight, draw a block in any direction required, and by this method of setting all blocks can be rolled into position with the full crating on, as the bottom of the crate can be easily pulled out by a slight raise.

The accompanying illustration will sufficiently show its practicality and the method of using it.

Another simple and easily adjustable appliance is the Meredith sub-base setter, a patent for which has been applied for by the inventors. With this implement a polished base of almost any size and weight can be set with perfect ease and security, either by hand or with bars or jack. The appliance has given complete satisfaction to all who have used it, no matter how tedious or massive the monument to be set, there being absolutely no difficulty in setting a stone weighing half a ton by hand, and where larger and heavier monuments are to be set it can be easily and expeditiously accomplished with the setter, manipulated by a jack. — *The Stone Trades Journal*.

THE ROMAN FORUM.

A CORRESPONDENT of the *Scotsman*, when describing the Historical Congress at Rome, says: "Naturally, the recent excavations in and about the Forum have proved highly attractive, and Commendatore Boni has been indefatigable in displaying the results of his work to small parties and great, while he has explained it to the Congress at large by the aid of lantern projections. The lantern demonstrations in the large hall of the Collegio Romano, the seat of the Congress, have indeed been one of the features of the week, and the display of slides relating to the Italian excavations at Phaestos, in Crete, by Signor Pernier, was of special interest to British members as showing that Mr. Arthur Evans's Knossos is only one of many sites in the island that are contributing to restore to us the outlines of a long-lost civilization."

"The importance of these recent discoveries in the Forum Romanum is threefold. In the first place there has been a complete removal of the mediæval and modern buildings, notably the Church of St. Maria Liberatrice, which intervened between the Forum and the corner of the Palatine Hill overlooking it. The road, till recently in public use, that ran under the Arch of Titus is now closed, and the whole area about the arch and beyond it nearly to the Colosseum has been given up to 'scavi' which are extending from this side up the slope of the Palatine. Only the church and convent of S. Francesca Romana are allowed to survive, and the old cloister of the latter is being now fitted up as a Forum museum. Palatine and Forum form now a single field for exploration and, in consequence, the difficult topographical questions which concern the means of access at different periods from the one to the other have at last some chance of being settled. In the second place, the extensive clearances that have been made on the north side of the Forum proper beyond the Arch of Septimius Severus and eastwards to the Temple of Antoninus and Faustina have rendered easier the comparison of levels, with the result that some structures formerly ascribed to the regal period have been proved by their levels to be much later in date. Notably is this the case with our old friend the Cloaca Maxima, which is now relegated to the Imperial epoch. The original conduit of the time of the kings must have run at a much lower level."

"The third and most important result is the establishment of a new principle in the excavations of ancient Rome. Hitherto it has been the custom to clear away the accumulations of modern and mediæval times to such a depth as admitted of the complete display of the first stratum of antique masonry that was laid bare. This stratum might often consist of structures of the later Empire that had taken the place of earlier and more interesting fabrics of Hadrianic, Augustan or Republican times. The new principle, on which the more recent excavations have been carried out, establishes it as the duty of future explorers to examine all these underlying strata till the virgin soil

is reached, so that the earliest Roman, or perhaps pre-Roman, remains on each site will be made as clear as the more extensive relics on higher levels, to which alone attention has hitherto been paid. In this way is created a situation which corresponds in some degree to that existing in England at the epoch of church restoration in the last century. Early work in most of our old churches had been overlaid in the course of time by later, and to restore the old a good deal of what was more recent was sacrificed. This more recent work, however, though late-medieval or perhaps Jacobean, was part of the history of the church, and its summary obliteration gave rise to not a few well-supported protests. In the case of Rome it will no doubt be difficult to preserve the upper strata while investigation proceeds at the lower levels, but Signor Boni is fully alive to the danger here hinted at, and is sparing no pains to avoid any injury to works of secondary interest in the course of the more searching explorations of lower strata now demanded. The means adopted may be seen in the case of the so-called 'Lapis Niger,' or black marble slabs let into the pavement of the Comitium and supposed by the Romans of the later Empire to mark the place of burial of the founder of Rome. These black marble slabs, discovered a few years ago, have been supported below by concrete and iron, and are sustained exactly *in situ*, while excavations carried out beneath them have disclosed to view an interesting and apparently very archaic group of monuments connected with this supposed Heroön of Romulus. These relics, which include the broken stèle with the early inscription, have not yet been officially described and illustrated, but they certainly bring us into contact through a chain of tradition with the associations of the Rome of the kings. A more definite connection has, however, been established between the Forum as we know it and the earliest Rome by the discovery, close to the Temple of Faustina, of a group of primitive burial-places of a kind already known from excavations in other localities, some of which almost certainly go back to the epoch of the traditional founding of the city. In one of the graves, opened at the visit of the Congress, there is still lying a skeleton that most probably belonged to a member of one of the small separate communities out of which afterwards grew the city Rome. This discovery carries back the history of the Forum and its neighborhood farther than it has yet been traced, and much attention is naturally being paid to it.

"The extreme interest of these Forum excavations, and the prospect opened of new and fruitful work in the revelation of an older Rome that is still underground when we have reached the ordinary late Imperial levels, show that the recent opening of the British School at Rome has come just at the psychological moment, and establish in its favor a claim for practical support on all interested in historical studies. The School, located in a portion of the Palazzo Odescalchi, gave a reception which has been one of the pleasantest social events of the week. The official functions have included a dinner at the Quirinal to a selected number of delegates, and receptions by the Minister of Public Instruction on Sunday afternoon in the Palatine, and by the Syndic of Rome, Prince Colonna, in the Museum of the Capitol. The last two functions were necessarily crowded and miscellaneous."



[Contributors of drawings are requested to send also plans and a full and adequate description of the buildings, including a statement of cost.]

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AN EXTERIOR COATING FOR DESIGNING STONEMWORK.

NEW YORK, N. Y., May 25, 1903.

TO THE EDITORS OF THE AMERICAN ARCHITECT:—

Dear Sirs,—I would like very much to know through your journal if a coating of Portland-cement and sand could be made to stand the elements without peeling if applied to the exterior of a New Jersey brownstone church situated near New York. The stonework is laid up in broken ashlar, tooled margin 1 inch, and centre part picked or pointed so the surface does not vary much over one-quarter inch.

The walls have been up probably seventy-five years, and a number of stones have to be replaced every few years, as they disintegrate and crumble badly. If the cement will not be likely to stand, is there any coating that would arrest this decay? Thanking you in advance, I am very truly yours,

F. F. WARD.

[A COATING of Portland-cement and sand, in equal parts, would stand very well on a surface of New Jersey brownstone, and would protect it very efficiently from the weather. It would, of course, be necessary to pick off all loose stone before applying the cement coating, and the stonework must be freed, by scraping or otherwise, from the greasy coating that often forms over old stone, and must be thoroughly soaked with water before applying the cement. If this precaution is neglected, the porous stone will absorb the moisture from the cement, and it will soon come off.]

It may be observed that the Portland-cement coating will not add to the beauty of the building, to say the least, and there seems to be no way of making it presentable. A less efficient process for arresting decay, which, however, will not materially change the appearance of the stone, and may answer tolerably well, is to saturate it with a weak solution of silicate of soda. For this purpose the stonework should be as dry as possible, that the solution may be thoroughly absorbed. Silicate of soda, when purchased by the barrel, is a cheap substance, being used in many industries. The solution should be made as strong as the stone will absorb, without producing a varnish-like gloss on the surface. Stones vary in absorbing power, and the proper strength can only be determined by experiment. The ancient process was to follow the silicate of soda by a wash of fluoate of lime, but this adds very much to the expense, and is of uncertain utility. As in the case of a Portland-cement coating, all loose stone should be carefully picked off; and it would be advantageous, probably, to change the cornice of the church, so as to get more projection to the roof, and throw the water off better, the great majority of cases of disintegration of stonework being due to the soaking of rainwater from the upper part of the wall down through its substance. — EDS. AMERICAN ARCHITECT.]



THE ROMANCE OF A PICTURE.—There has just come to light in Bristol an interesting romance of a picture. For some years there has been hanging in the Bristol Young Men's Christian Association a picture entitled "The Holy Family." The owner lent it for a long time, and once proposed that the Association should buy it. He did not wish to drive a hard bargain. The picture was obviously a good one; it was 4½ x 6'. Would the Committee like to buy it for £10? "If you would," he said, "I am so much in sympathy with your excellent work that I am willing to contribute £5 myself toward the purchase money." But the Committee felt that they had more important demands for their £5 notes, and they replied accordingly. By-and-by the owner died, and the executors began to realize his estate. The picture was looked up and the work was ordered to be packed and sent to London for sale. Judge the satisfaction of the executors when they received an offer of £7,000 for it, and were advised not to sell under £10,000. Experts have identified the picture as from the brush of Pietro da Cortona, the great Italian painter of the early seventeenth century. — *London Chronicle*.

ACTORS AND FASHIONS IN ARCHITECTURE.—American millionaires are building their country-seats after the fashion of Old World castles. Architects give the credit of the fad to the turrets and donjon keeps of popular actresses. The unwritten law of the stage almost seems to be that a successful season in America must be followed by the purchase somewhere of a Schloss. Patti set the precedent by establishing herself at Craig-y-Nos, Jean de Reszké retreated to the depths of Poland, to his beautiful estate of Borovna. Bernhardt took to an island in the Mediterranean, and Calvé ensconced herself in the South of France, on a rock that recalls Gibraltar. Alluring word-pictures of these castle homes prove tempting to the millionaire, whose greatest ambition is to eclipse neighboring Mr. Moneybags in the erection of a palace. But

only occasionally does American wealth get the better of American common-sense, and bring to pass such haunting absurdities, emphasized by incongruous surroundings in grounds and gateways. When the American imitation of the British castle is fashioned tactfully after ancestral homes, and when good taste is displayed throughout, the result is more pleasing. Imposing and massive stone entrance-ways sentinel these suburban keeps, and not only the doorways, but the domed and turretted conservatories, and all the various details of the huge mansion, correspond in architecture with the striking entrance-way to the extensive grounds. — *The Cosmopolitan*.

CHICAGO CANAL AND THE LAKE LEVELS. — During all the discussion which preceded the digging of the Chicago drainage-canal, the chief argument of the opponents of the scheme was that so great a body of water taken out of Lake Michigan would seriously affect the levels of the Lakes, which were none too high, and would hamper commerce greatly. The canal has now been open for three years. According to the calculations made by some engineers retained by Canada the level of the lakes should now be 9 inches lower than it was in January, 1900; but the survey of the Government engineers for April shows that the level is 12 inches above what it was in 1896 and nearly 5 inches above what it was five years ago. This goes to prove that the canal has had no effect on the lake-levels, which fluctuate now as they have ever since the first observations were made in 1854. — *Boston Transcript*.

THIRTY-THOUSAND-DOLLAR LEGACY FOR ART. — The will of Thomas W. Wood, artist, of New York, leaves the bulk of his property, estimated at \$30,000, to the Wood Art Gallery, Montpelier, Vt., founded by him. — *Exchange*.

"THE HEAVENLY ROOSTER." — In the *New York Times* Mary Knight writes: "In view of the coming celebration of the birthday of the city of New York, it is interesting to inquire what is the oldest thing in it. I have always heard that the weather-vane on the white church at the corner of Fifth Avenue and Twenty-ninth Street, playfully known as the Church of the 'Heavenly Rooster,' claims the honor, which is disputed by the bell that hangs in the belfry on the corner of Fifth Avenue and Forty-seventh Street. Both came from Holland and were presented to the churches with appropriate ceremonies, accounts of which are doubtless still preserved in the archives that probably would give the dates that could prove the respective ages of both relics."

FOREST-FIRE PREVENTION. — The lessening of the damages occasioned by forest fires from which New York, in common with most of the other States, has suffered severely, is the object of a new branch of investigation undertaken by the Bureau of Forestry under the direction of Gifford Pinchot. Last year within two weeks over \$12,000,000 worth of timber and other property was destroyed by forest fires in Oregon and Washington. This enormous loss occurred on a restricted area and represented only a small part of the annual loss from this source. Every timbered region of the United States suffers year after year from fire. The annual loss is estimated from \$25,000,000 to \$50,000,000. Forest fires have been regarded as almost inevitable, and few systematic attempts have been made to prevent or control them except in the States of New York, Pennsylvania and Minnesota, which have efficient systems of fire-protection. The Bureau of Forestry has last year undertaken a thorough study of the forest-fire problem in several different regions. It has placed men in forest districts to study fires while in the process of burning. Instead of waiting until the fires are over and relying for information on local reports, as has been done heretofore, the fires are now being observed by the bureau's agents and full data will be obtained as to how they were caused, how fast they burn, what conditions favor or hinder them, and just what damage they do to the soil and to tree growth. Each agent of the bureau has been assigned to a district and is investigating all fires that occur within his territory. For example, one man studies a lumber tract, another a farming district, a third a turpentine orchard, etc. In connection with this detailed study, the agents will observe the methods of fire-protection practised by railroads and other owners of timber-lands. The fire-warden systems of the States which have forest-fire laws, and the patrol system in use on the Federal forest reserves, will also be observed closely. By such methods the Bureau of Forestry hopes to replace with carefully gathered facts the vague general notions that now exist about forest fires. When the problem is solved for any particular region the Bureau will be ready to recommend methods of fire-prevention and control for the private land-owner, and to suggest forest-fire legislation for the various States. The investigation is now in progress in Northern Florida and Southern Alabama and Georgia under the direction of Ernest A. Sterling. H. J. Tompkins, with a small corps of assistants, has begun the work in Minnesota, Wisconsin and Michigan. Later in the season a study of forest fires will be made on the Pacific Coast. — *N. Y. Tribune*.

THE PICTURESQUE TREES OF ITALY. — When the heart seeks broad oaks or cathedral firs, it is the North that calls, and, if in Italy, the feet of a Northerner stray into some unlooked-for *selva oscura*, he finds himself presently thinking of home. For, in spite of great exceptions, forests of pine, or fir, or chestnut, the characteristic trees of Italy, are detached, sharply outlined, impressive from loneliness and contrast. In groves, in groups, in avenues, in files, in couples and singly, they cut the sky, and it is the general treelessness of the landscape that gives to the infrequent trees their peculiar beauty. They are so defined and individual that one remembers the cypresses of a Tuscan city exactly as one remembers its *campanili*, and it would be as easy to forget the dome of St. Peter's as to forget the single palm-tree of St.

Bonaventura. I have seen it from the Pincian Hill on a gray winter day, pale against a paler sky, yet distinct in outline as the convent itself. It looked lonely as a seventeenth-century ghost, keeping uneasy watch between the advance of archaeological excavation and of modern building. I shall always remember a May morning years ago, when, on the journey from Florence to Rome by way of Arezzo, I made discovery that the attenuated trees of Perugia are real, not fancied. It was my first lesson in the faithfulness of the Umbrian and Tuscan landscape-painting. — From "*The Lover of Trees in Italy*," by Sophie Jewett, in the *June Scribner's*.

TWO UNTHOUGHT-OF FIRE-RISKS. — Many fire-insurance policies forbid the filling of receptacles with kerosene, gasoline, or other inflammable liquids in places where an artificial light is burning. That is all very right. The rule, however, should be extended to incandescent lamps, also, as they are just as likely as not to cause the same effect to be induced under similar conditions. One instance out of others may be quoted. Some time ago an employé in a sash-and-blind factory was varnishing some blinds in a room lighted by lamps of that sort. The work had been going on some time, and the air was fairly well laden with fumes from the varnish. In moving the blinds about, one of the workmen happened to strike and break one of the little bulbs, and in a second the room was filled with flames, the two men barely escaping with their lives. The factory was destroyed, with loss of about \$50,000. Of course the incandescent film in the lamp was exposed only the fractional part of a second after the glass was broken; but it was evidently long enough to make serious trouble. This seems to prove that inflammable vapors and incandescent lamps make a dangerous combination. Another risk, which applies to other places besides Philadelphia, may be adverted to as one which has caused fire-engineering experts some anxiety. It is the installation of gas pumping-engines in the new pumping-station at Philadelphia. These engines are for use only in emergencies, and it is feared that the sudden turning on of full gas pressure may cause a serious explosion, not alone wrecking the station, but destroying a portion of the feed-water mains as well. Gas-engines, especially when not continuously used, are easily damaged, and are, therefore, a source of danger. — *Fire and Water Engineering*.

NEW YORK CITY-HALL'S ARCHITECT. — Mrs. Frances Gale Spowers and Mrs. Collingwood, of Montclair, N. J., great granddaughters of John McComb, the architect of the City-hall, loaned an oil-painting of their great-grandparent to be hung up during the past week in the corridor over the memorial tablets. These memorial tablets were placed in position on the roof of the City-hall in February, 1803, and were only recently discovered there. They were removed Saturday, and placed on the wall of the west corridor. They have been so weather-beaten that the inscriptions on them are very faint. The names on the tablets are John Lemaire, Sculptor; John McComb, Jr., Architect; Abraham Lanchester, Stone-cutter; Nathan Sternback and Arthur Smith, Master Masons; Joseph Newton, Master Carpenter; John Hopson, Clerk; Aldermen Moras, Fish, Douglass, Waldron and Lawrence, Building Committee. The picture will hang over these tablets. — *Exchange*.

MODERN CLIFF-DWELLERS OF FRANCE. — We have often heard of the cliff-dwellers and are accustomed to think of them as a prehistoric race, the remains of whose few scattered dwellings are a matter of curiosity to tourists and a prize to antiquarians. Few people know that, at the present day, there are whole communities in France whose only habitations are hollowed in the rocky hillsides and whose entire business life is carried on in caves. We had seen in Normandy isolated instances of people living in habitations half house and half cave. But they were in far-away towns and villages, and only the very poorest class of people lived in them. Our first real cave city came as a great surprise, for we have just left Tours, one of the most highly civilized cities in France. We were riding on the road to Vouvray when suddenly, at a turn near Rochecorbon, this first town of cliff-dwellers burst upon us. High above us towered a huge mass of overhanging rock, strata upon strata, bearing upon its summit a most peculiar tower, supposed to have been a watch-tower in ages gone by. Its foundations hung over the rock upon which they were built, and it seemed as though it would crash down at any moment upon the village beneath. Scattered over the face of the cliff, doors and windows, narrow stairways and little belvideres could be seen, habitation upon habitation, in most picturesque disorder. Walls along the high-road hid the immediate foreground, and we looked in vain for an opening by which we could have a nearer view of this strange community. At last we found an open gate, and, peeping through, were greeted by a dear little old woman, whose wrinkled, smiling face was surmounted by a snowy white cap. Her doorway was a bower of flowers, hollyhocks, asters, nasturtiums and deep June roses. By its side was an old well and a little out-house for her wood and gardening tools. Her cheery "*bon jour*" was an invitation to enter, and we gladly accepted her cordiality. We followed her across the little yard and were soon seated in her one and only room. — From "*The Cliff-dwellers*," by E. C. Peizotto, in the *June Scribner's*.

PRISON SHIP MARTYRS' MONUMENT. — The cash the Prison Ship Martyrs' Association Fund now has on hand, as reported by the treasurer, Edward Johnson, is \$20,622. There is a subscription also from the Empire State Society of the Sons of the American Revolution of \$1,000, which will leave only \$3,378 to be obtained to enable the Society to receive the several appropriations of \$100,000 from the Federal, city and State Governments. Active efforts are being made to get the sum needed, and it is expected that this will be done in time to begin operations in the fall. — *Exchange*.

THE AMERICAN ARCHITECT AND BUILDING NEWS

ADVERTISERS' TRADE SUPPLEMENT

No. 253

SATURDAY, JUNE 6, 1903

VOLUME LXXX
No. 1432

HOWARD CLOCKS.

AMONG recent orders filled by the E. Howard Clock Company, of Boston and New York, are the following: Watchman clock-systems installed for the American Axminster Industry, Auburn, N. Y., and for the Stillwater Mfg. Company, Stillwater, Minn.; a large tower-clock with bell for the court-house at St. Francisville, La., and a tower-clock with 8-foot dials for the Congregational Church at Holliston, Mass.; also two special bronze clocks for the interior of the New York Stock Exchange, and a fine post-clock for the Lorimer-Wright Company, Providence, R. I.

In this connection it may be of interest to our readers to know that during the many years' active business life of this Company it has manufactured and set in operation over thirty-five hundred tower-clocks, in all parts of the world, on public and business buildings, churches and school-houses. We find among a list of seventeen hundred references given in the Company's booklet on tower-clocks references to installations made in South America, Sicily, Mexico, Japan, India, Greece, China, Canada, and in almost every State of the Union.

In the City-hall, Toronto, Can., there is an E. Howard clock that has been running for fifty years, and is to-day, apparently, as fine a time-keeper as ever. This is only one of the many instances which could be cited to show the long life of a properly constructed clock such as this Company produces.

The Broadway tower of the magnificent New York Life Building, with its enormous four-dial clock, is one of the sights of the metropolis. The clock in this tower, one of the E. Howard Company's make, runs hands for four dials, each 12 feet in diameter, and strikes the hours on a bell weighing 6,500 pounds, while to operate the clock movement and the striking mechanism weights of 3,000 pounds are required. The clock is wound once a week by means of an electric motor. At the Elm-street end of the building is another tower-clock which controls by means of an electrical contact about one hundred secondary clocks distributed throughout the building. This clock runs hands on one dial 12 feet in diameter. These clocks were installed in 1896 by this Company, and experts generally agree that it is as perfect a

time-keeping system as can be found in any building in the world.

Certainly the E. Howard Company has earned an enviable record for the perfection of its work, and the claim made by its management that they "make a clock superior to any made in this country and equal to any made in the world" seems founded on fact.

This Company is at all times pleased to consult with architects and builders concerning

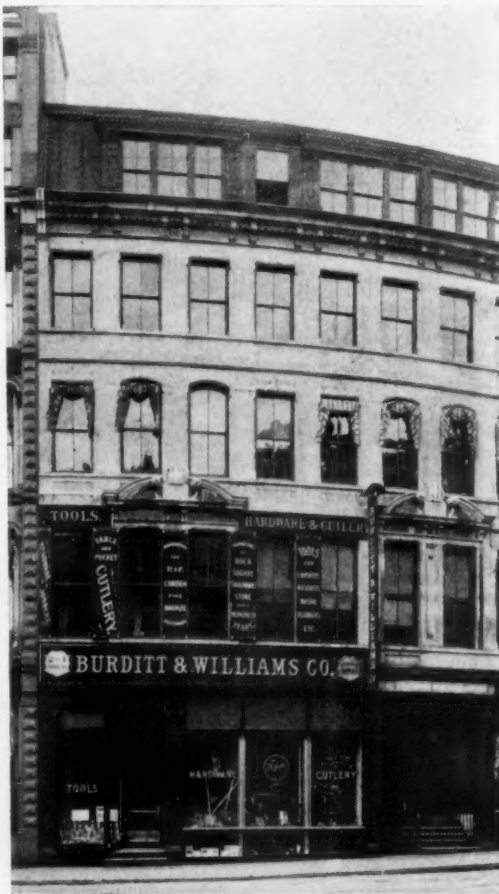
Building, New York, although their lease has still some time to run, and move to the Whitehall Building facing Battery Park, because of the impossibility of procuring additional accommodations in the former building and of the absolute necessity for increased office facilities.

That a concern possessing about 12,000 square feet of floor-space for its executive and sales offices in the popular Empire Building should be compelled to move, notwithstanding the possession of an unexpired lease, simply to get more room, is an encouraging prospect, since the status of the elevator industry is indicative of the condition of affairs in the building and real-estate trades, and, in fact, of the condition of business in general.

A SUCCESSFUL HOUSE.

IN 1860 Messrs. Burditt & Williams put up their modest sign over the hardware store at No. 20 Dock Square, Boston, which had then been for more than sixty years devoted to the same business.

A few days since the Burditt & Williams Company, still retaining their original location, threw open the doors of a new and spacious store at the corner of Summer and High streets. This enlargement of their quarters simply keeps pace with the steadily increasing requirements of their business; for, while forty-three years ago they had use for only one assistant and a boy, to-day they find employment for a force of more than sixty; and while in 1860 the street-floor of No. 20 Dock Square was ample for handling their trade, they have during the intervening years been obliged to add thereto until even the entire building was inadequate and they were obliged to add an equal amount of outside space. So that the addition of this new store has been suggested by purely business requirements. It has become an absolute necessity for them to add this large space not only for convenience in handling their trade, but



New Store of the Burditt & Williams Co.

for the greater convenience of their patrons. Their growth has been impeded by want of room such as this enlargement affords them; and recognizing the fact that the spirit of the times requires new methods, greater facilities and finer appointments, this house, by this new move, strengthens its position in the forefront of dealers in its line.

THE E. HOWARD CLOCK CO.,
BOSTON, MASS.

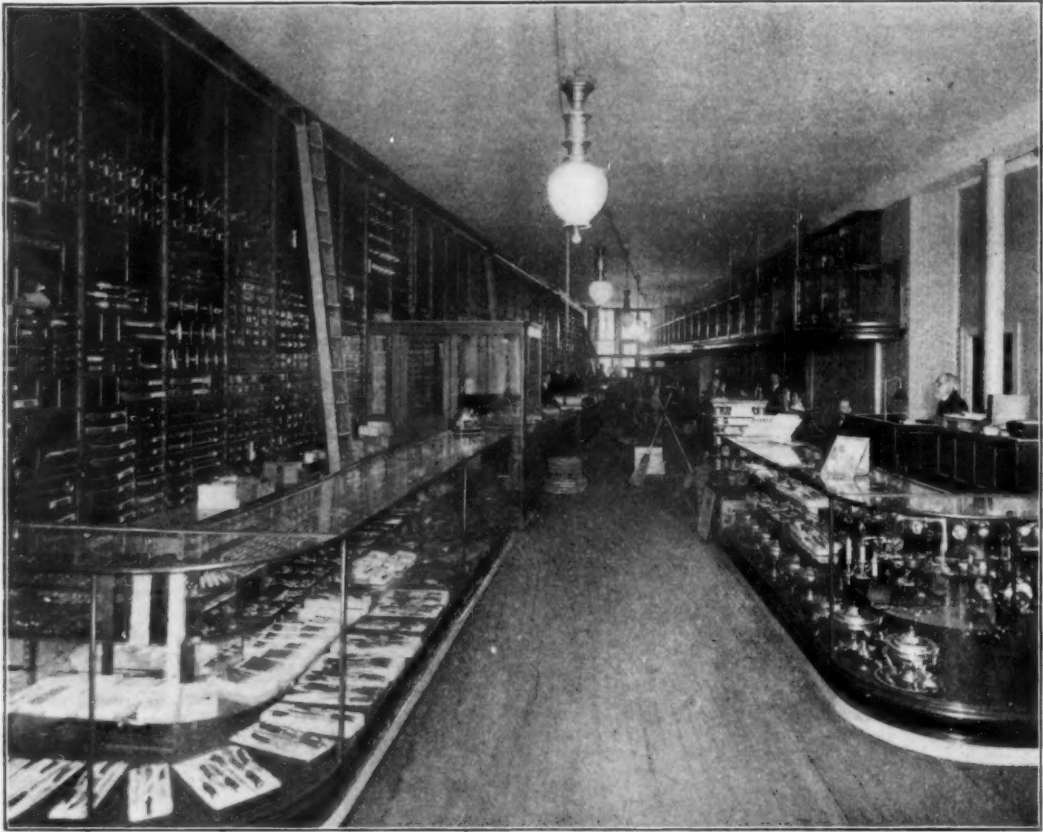
The Otis Elevator Company will relinquish their extensive suite of offices in the Empire

The tasteful and up-to-date appointments of the new store reflect the change in methods since their early days. The location, only

seventy yards from the Southern Terminal Station, on the Summer Street corner, and

The store-front is 35 feet. The depth of store is 135 feet. In all three floors there are

for the use of architects, builders, and other patrons of the house. This room is finished



General Store of the Burditt & Williams Co., Summer and High Streets, Boston.

but a few yards from the Federal Street corner of High Street, makes the store won-

more than 12,000 feet floor-space.

A unique feature of this new store, so far

in mahogany and crystal, with brilliant electric effects, and furnishings in harmony with



Architectural Sample-room of the Burditt & Williams Co.

derfully convenient for the surging tide of passers taking the line of either street.

at least as Boston is concerned, is the reception-room, expressly designed and set apart

the architecture. Altogether, the effect is beautiful, and it is certainly a "cosy corner"

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The
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HANOVER BANK

UNION CLUB

N. Y. LIFE INS. BUILDING

STANDARD OIL BUILDING

Atlas Portland Cement Company

30 BROAD STREET
NEW YORK

in this great mart of trade. With the exception, we believe, of one in New York City, there is no similar room connected with any hardware establishment in the country. In it will be found finely displayed on shelves and sliding-racks samples of the finer lines of hardware, for the sale of which the Burditt & Williams Company have deservedly gained a country-wide reputation. The addition of this room, in such a central location, we think will be fully appreciated by visiting architects and their clients, and by the building trades generally.

While making an elaborate display of cutlery and fancy hardware, the shelves in the main store are loaded with the substantial builders' hardware and mechanics' tools, in the sale of which this house made its earlier reputation. Years ago it attained a prominence in the supply of the finer grades of hardware for buildings, and its reputation in this line increases as the years go on.

In their long term of existence as potent factors in the business life of Boston, Messrs. Burditt & Williams have made little change in their corps of assistants, except as increase became necessary. Some have been in the employ of the firm from twenty-five to thirty years, and a very large proportion for more than ten years. In over forty years the firm has paid thousands of dollars to the fire-insurance companies, but has never called upon them for one cent.

The opening of this new location, which makes a notable addition to the fine stores in the rapidly developing Summer Street section, does not, in any sense, involve the abandonment of the "Hardware Store for a Hundred Years," in Dock Square, which has been the property of this house for forty-two years.

In 1796, the records report, Jos. Scott, Jr., conducted a hardware business there. In 1800 he was succeeded by John Odin, and he in turn by T. W. Haskins & Company, in 1829. Next was Otis Vinal, who succeeded in 1840, and from him Messrs. Burditt & Williams bought the stock and fixtures in 1860.

The original firm of Burditt & Williams was founded in 1860, by Mr. Chas. A. Burditt and Mr. Jos. Williams. The firm continued thus until 1886, when Mr. Jas. A. Munroe was admitted, and later, in 1900, Mr. Jos. H. Williams, a son of one of the original partners, assumed partnership relations. The business continued as a firm until 1901, when it was incorporated under the laws of Massachusetts as the Burditt & Williams Company.

Thus is shown the history of a successful firm. Successful in the highest sense of the word, for the name Burditt & Williams Company is synonymous with all that is honorable in business affairs, and the long identity of its members with the hardware-trade places them in excellent position to fill the thousand and one requirements of architects and builders, and of the public generally.

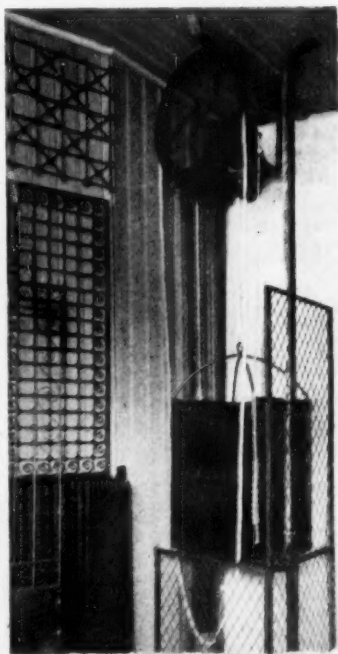
THE Otis Elevator Company is to install eight high-pressure inverted plunger hydraulic passenger-elevators in the Bessemer Building,

Pittsburgh, and in the Phipps Power-house adjacent thereto, the latter building supplying power to the various buildings in the neighborhood owned by Henry Phipps. These elevators are of the same type as those in the Prudential Building in Newark and those to be installed in the new Metropolitan Life Building in New York.

THE W. J. PERRY DUMB-WAITER

MR. W. J. PERRY, 591 Atlantic Avenue, Boston, the well-known manufacturer of elevators, elevator gates and locks, and dumb-waiters, has recently placed upon the market a dumb-waiter for which he claims several important improvements.

The essential feature of this waiter is that



The W. J. Perry Dumb-waiter.

it is roller-bearing, consequently is operated with a minimum of friction, and it has a natural lifting-power in proportion as three is to one.

Another feature is the band-brake device, which is wholly controlled by one rope, thus avoiding all complication of the extra rope in locking or unlocking the machine. The waiter can be stopped at any point by this one rope, either in going up or down, and the speed likewise can be governed by the same means.

All pulleys and parts of the machine are adjustable. It is noiseless in operation, and the total weight of rope, wheel and machine does not exceed seventy-five pounds. It is very easily and economically installed, and counter-weights sufficient to offset the weight of the car are furnished without extra cost.

There would seem to be a large field for a dumb-waiter possessing such improvements as are claimed by Mr. Perry for this. His work in connection with the manufacture of elevator and dumb-waiter attachments has heretofore proved very satisfactory, as is instanced in his contracts at the Boston Terminal Station, for Armour & Co., Worcester and Boston; Edison Electric-light Co., Boston; Silver Spring Blacking Co., Providence; United States Leather Co., Congregational House and Library Bureau, and for other firms and corporations of like standing throughout the East.

We understand that it is Mr. Perry's intention to introduce this new device through local agents throughout the country, and he invites correspondence with builders and dealers who are in position to give such business their attention.

THE BROWN MEMORIAL WINDOW.

THE Brown Memorial Window recently placed in the chancel of Emmanuel Church, Newport, R. I., has awakened such interest, especially among those who distinguish the difference between stained-glass considered from the standpoint of art, and that which is the usual commercial product, that we feel it should have mention in our pages.

The work is that of Harry Eldredge Goodhue, who last year opened a shop at 23 Church Street, Cambridge, Mass., for the purpose of making windows strictly in accordance with the craftsmanlike spirit of the past.

Mr. Goodhue has made extensive studies abroad of the old Cathedral windows, and believes that the work of the thirteenth-century French glaziers must ever remain the best examples to follow. And this Newport Memorial would seem to show that he has mastered the method. An idea of the beauty of the transparent imported glass (there being none of the American opalescent used) may perhaps be best gathered from the following notice in the Boston Transcript of April 1:—

"AN IMPORTANT WINDOW BY MR. GOODHUE.

"Mr. Harry Goodhue is just completing, in his atelier in Church Street, Harvard Square, Cambridge, an important stained-glass window 22 feet high for the chancel of Emmanuel Church, Newport, R. I. This work is very elaborate in design, and is full of small figures and fine leading, there being more than one hundred figures in all, in groups illustrating scenes from the life of Christ. It has been the artist's endeavor to follow the methods and the spirit of the thirteenth-century glaziers of France, whose windows, as is well known, are the *ne plus ultra*. Many good judges who have seen Mr. Goodhue's work have been highly pleased with its success. Mr. Langford Warren, for instance, says that it is the best modern window he knows of. It may be pertinent to recall, in

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Works at Alsen, N. Y., on Hudson River

this connection, what John Ruskin wrote about stained-glass windows in *'The Stones of Venice.'* The true perfection of a painted window, he stated, is to be serene, intense, brilliant like flaming jewelry, full of easily legible and quaint subjects, and exquisitely subtle yet simple in its harmonies. In a word, this perfection has been consummated in the designs, never to be surpassed, if ever again to be approached by human art, of the French windows of the twelfth and thirteenth centuries. Mr. Goodhue's success in reverting to the methods of that early period sufficiently demonstrates their decorative superiority. In color his window will be a glorious monument of art, and a joy forever; and it answers very well to the Ruskinian description of what a stained-glass window should be—'serene, intense, brilliant like flaming jewelry,' and 'full of easily legible and quaint subjects, and exquisitely subtle yet simple in its harmonies.'

In an interesting little pamphlet, which, among other things, is an admirable example of effective rubrication, the Standard Manufacturing Co. of Pittsburgh give the story of their advertising experience for the last sixteen months. It appears that by a judicious use of mediums they brought their goods each month within the range of possible observation of between three and four million families, or a total circulation of fifty-five million copies.

Now, if all this great circulation had consisted of magazines and "general" advertising mediums, it would have been possible perhaps to argue that the same actual return could have been secured from a smaller circulation. Perhaps it could; but we doubt it. We have ourselves noted their advertisements in many of the magazines we take home for family reading and we, of course, know that their advertisement is to be found in our own pages, and so we believe that their plan of advertising has been judicious, and there is nothing so productive of business as judicious advertising. We would never think of advising any one who dealt in any building-material or apparatus which might be actually used and operated by any one to confine his advertising outlay to the technical building-periodicals, or suggest that travelling-men were useless, or that the use of circulars and catalogues was a great mistake. But we do feel very strongly that, whatever methods the manufacturer does employ, he should not neglect to keep his name and wares constantly before the eyes of that fraction of the people whose sole interest and occupation it is to build and to install in the structures he builds the most desirable kind of apparatus.

It is a matter of very real unfairness that of all advertising-mediums a manufacturer can use there is none so hard to trace returns to as the architectural periodicals, from the simple fact that architects are not themselves the consumers.

THE PUGH MEMORIAL WINDOW.

THE accompanying illustration shows a window recently furnished by Hutchings, Murphy & Co., of Boston, in competition with ten or more of the leading stained-glass firms of America, for Mr. Pugh, first Vice-President of the Pennsylvania Railroad, and placed in the Eighth Avenue M. E. Church, of Altoona, Pa., as a memorial to the parents of Mrs. Pugh.

It represents the "Ascension of Christ surrounded by the Apostles," and while it is largely treated in opalescent glass, it is, nevertheless, treated in a decorative manner, and the garments of the figures are painted, em-

and probably, as a consequence, meet with more success in competition with the firms of Europe than any other concern in America doing business in their line.

That there is one firm in this country willing, for the sake of decorative harmony, to sacrifice the pictorial character which lends itself so easily to their work should be known, and the firm in question is entitled to the encouragement and recognition of persons or publications competent of appreciating their motives.

DETERIORATION OF STRUCTURAL STEEL.

A GREAT deal has appeared lately in the technical journals regarding the deterioration of structural steel through corrosion and the remedy thereof. That steel, unless properly protected, soon reaches the danger-point is universally admitted. Professor Charles L. Norton, of the Massachusetts Institute of Technology, says: "The examination of buildings ten to fifteen years old, when, during alterations, the steel framework has been exposed to view, reveals all stages and conditions of disintegration of the steel. So great has been the corrosion, even in this short time, in some cases, that a note of alarm has been sounded by some engineers most familiar with the subject."

Many preparations have been used with varying results in the hope of staying the destruction. The ideal protection of course presupposes durability above everything else. A paint that cracks or peels, that wears off through the action of heat, cold, fumes, moisture, or wind, that is susceptible to chemical action *within itself* after application, is to be rigorously avoided. Red-lead and iron-oxide, generally regarded as the most economical and proved the most costly, are among the noted offenders.

During the last decade, however, graphite paints have been gradually replacing all others. Graphite, properly mixed with linseed-oil, is absolutely unaffected by the injurious elements just mentioned. Such a preparation is tough, fibrous and adheres firmly to the material upon which it has been spread. It is as near an ideal protective paint as can be made. "Superior Graphite Paint," containing a sufficient amount of *naturally incorporated* graphite to ensure cohesion between pigment and oil, is preëminent as a protective covering. Repeated competitive tests have proved it to be practically indestructible. Information will be furnished gladly by the Detroit Graphite Manufacturing Co., Detroit, Mich.

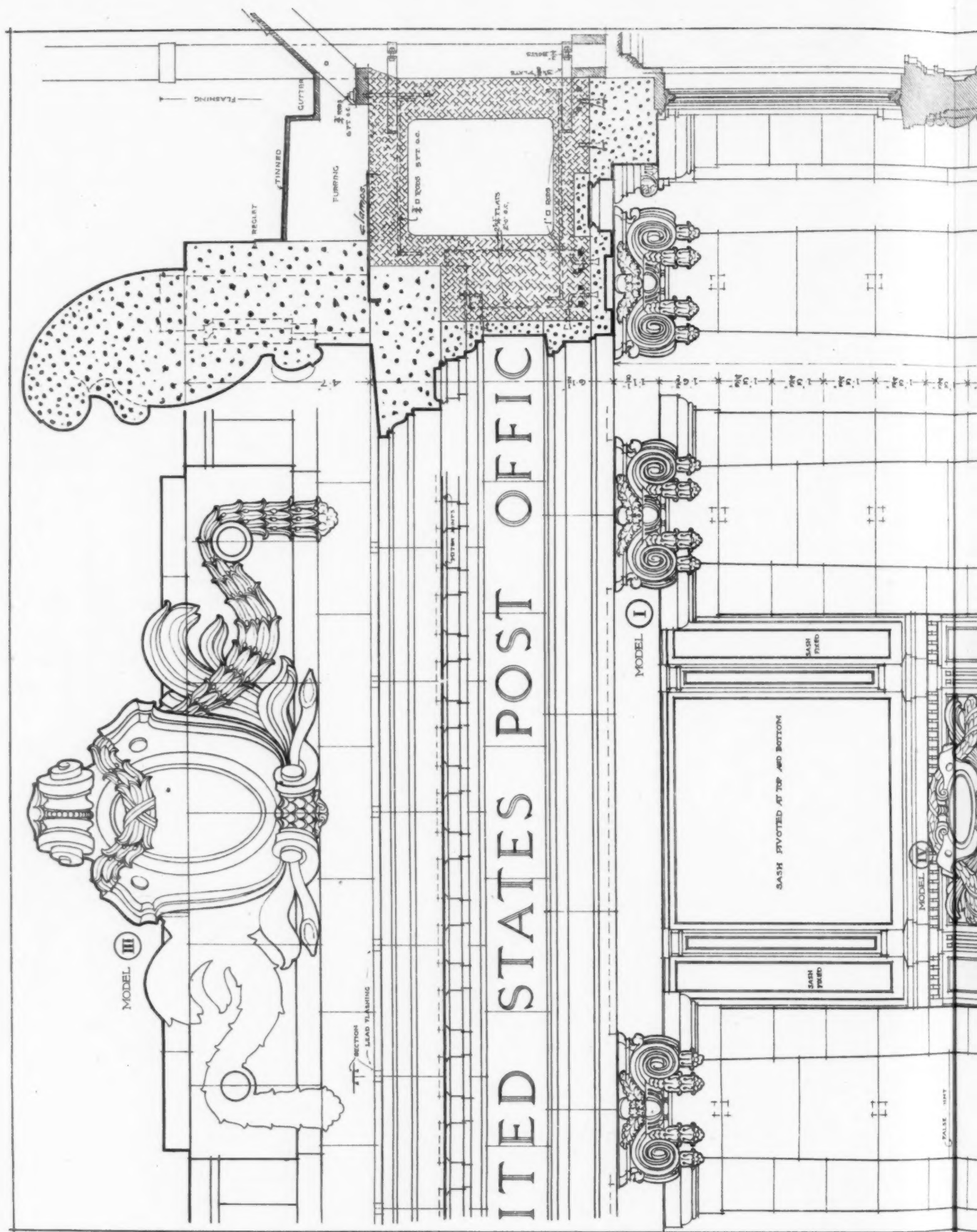


The Pugh Memorial Window.

ploying imported British antique glass for their construction.

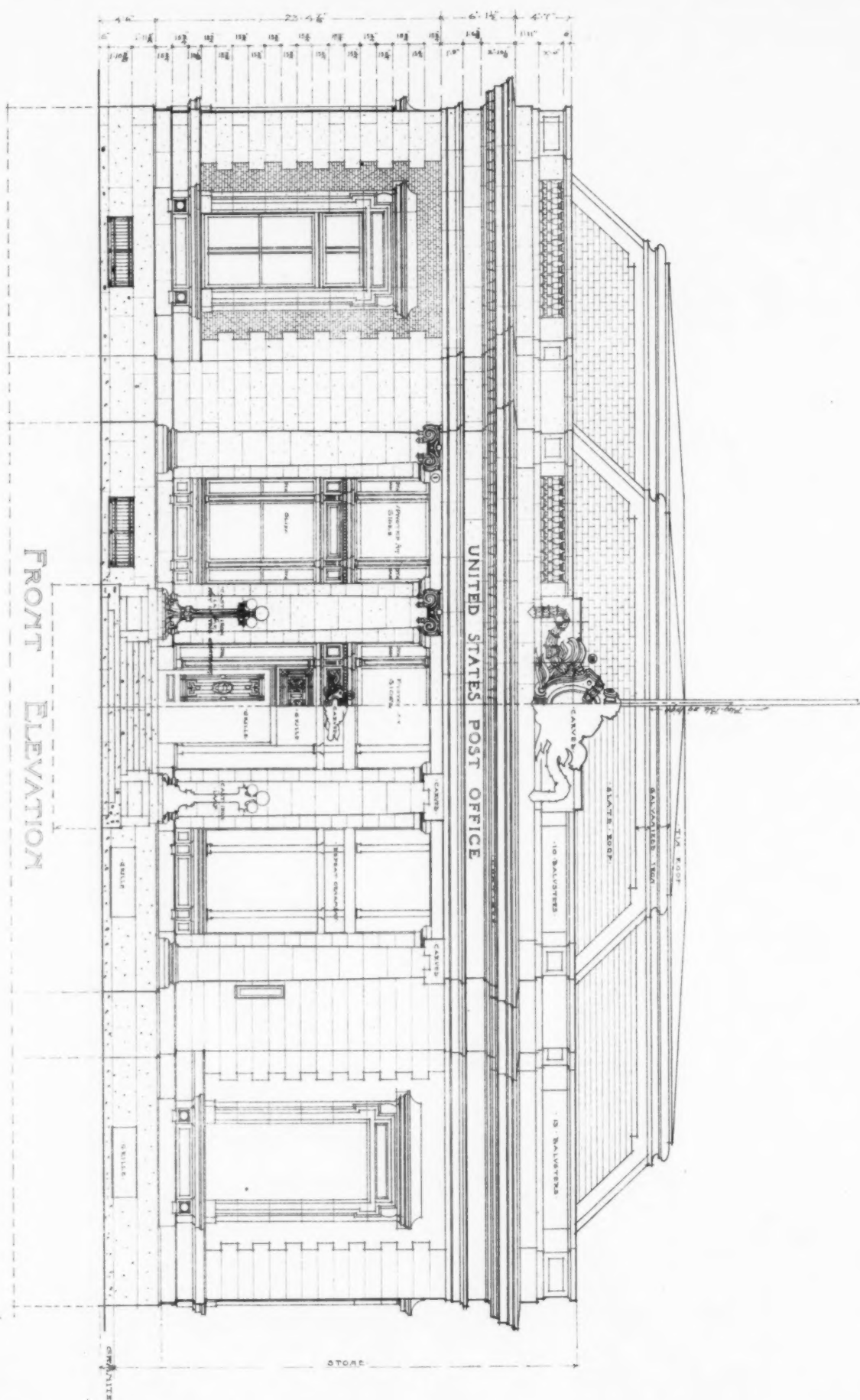
Hutchings, Murphy & Co., the firm which designed and executed this window, have made great progress in their profession of recent years, and are sending beautiful specimens of their work to all parts of the United States.

The above firm are staunch believers in decorative rather than pictorial treatment,



HELIOTYPE CO., BOSTON.

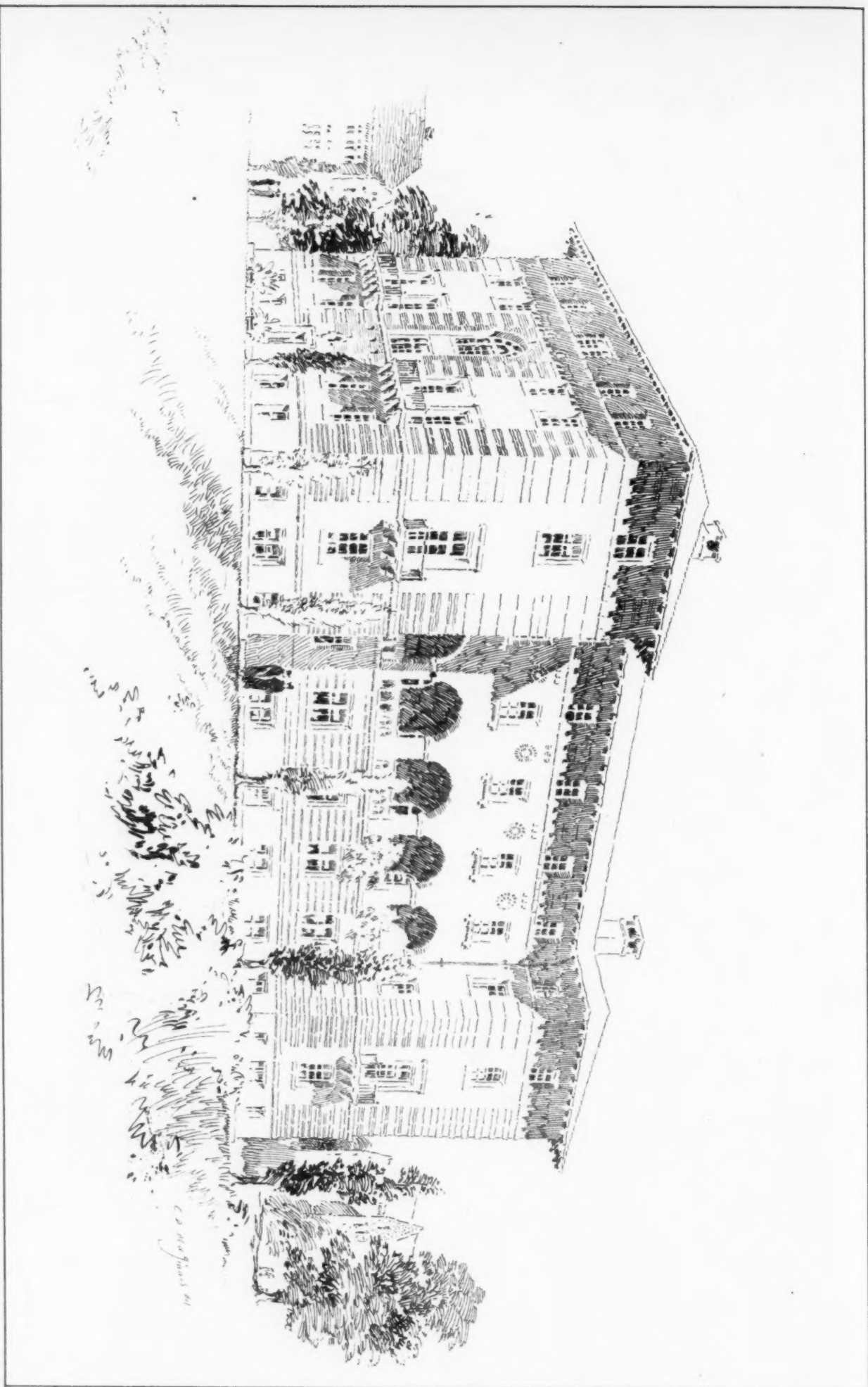
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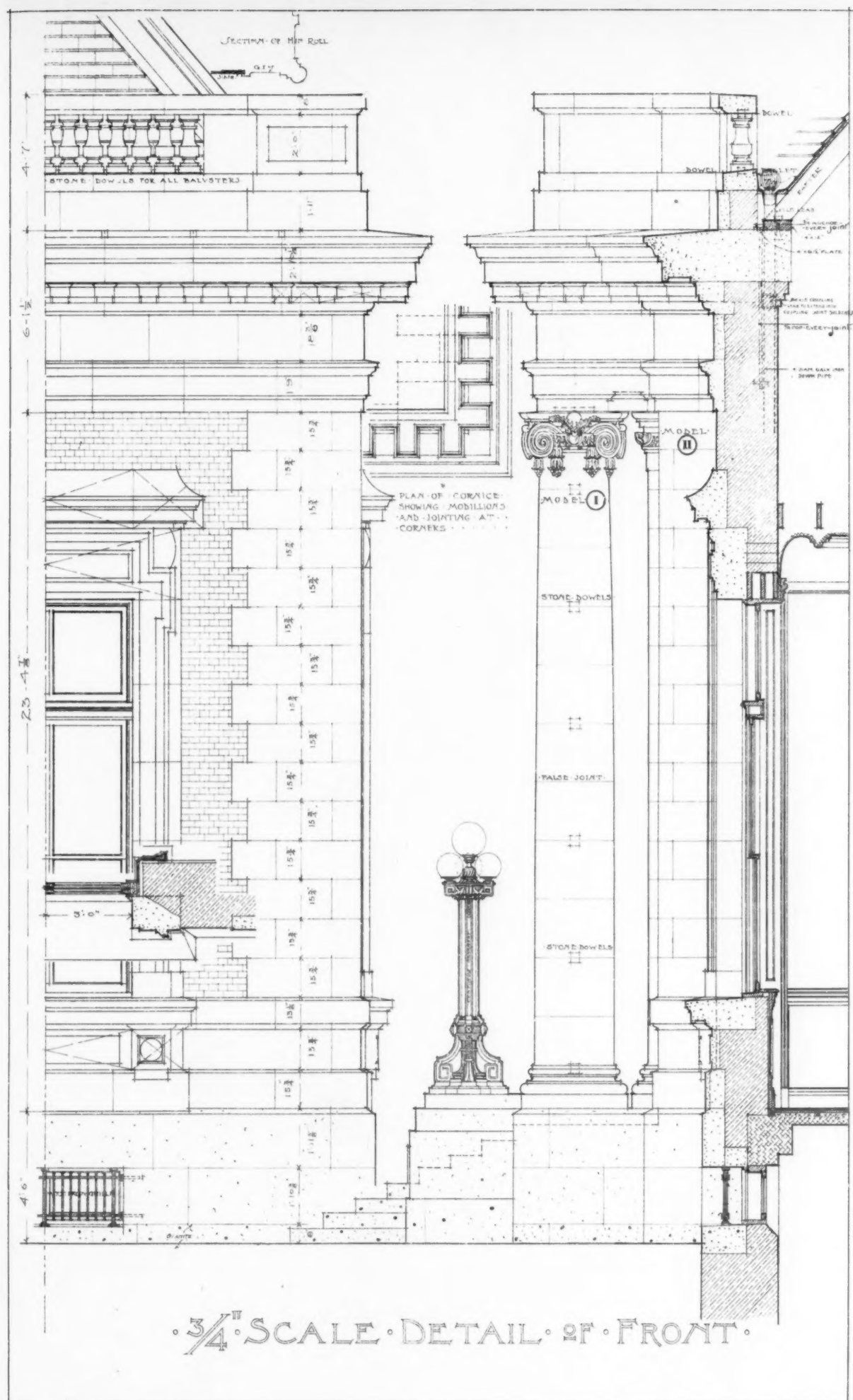


NEW APOSTOLIC MISSION HOUSE, WASHINGTON, D. C.
MAGINNIS, WALSH & SULLIVAN, ARCHITECTS.

HELIOTYPE CO., BOSTON.

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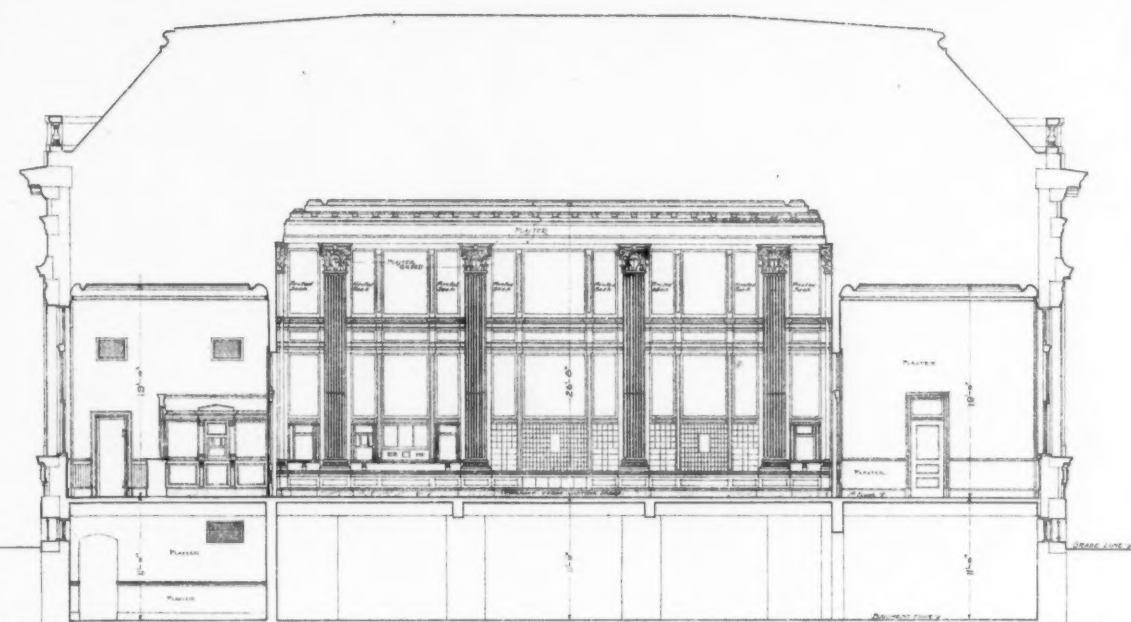
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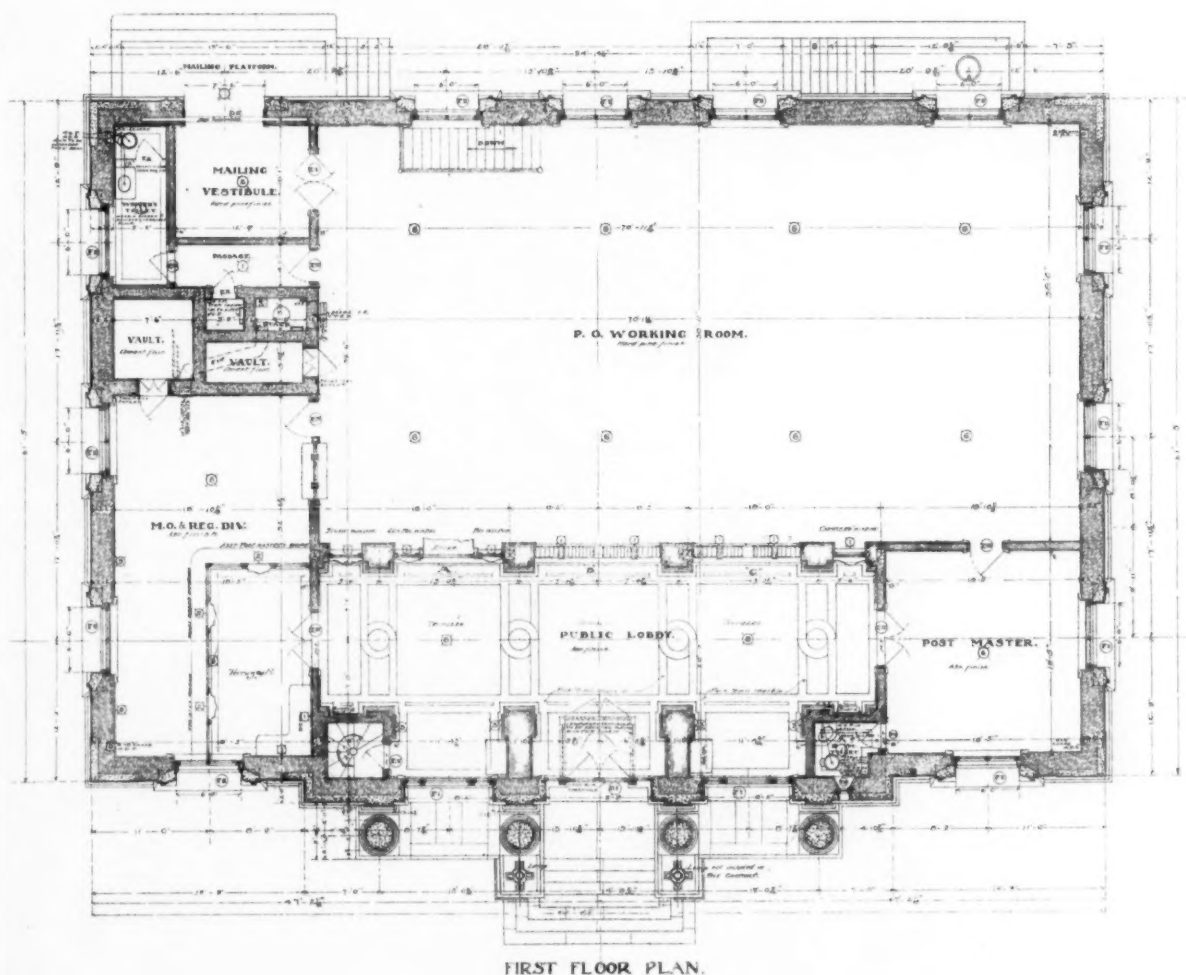
JAMES KNOX TAYLOR, SUPERVISING ARCHITECT.

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LONGITUDINAL SECTION
THIRD LOBBY



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A WEEKLY JOURNAL OF CONSTRUCTIVE AND DECORATIVE ART

VOL. LXXX.—No. 1432.]

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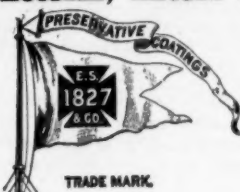
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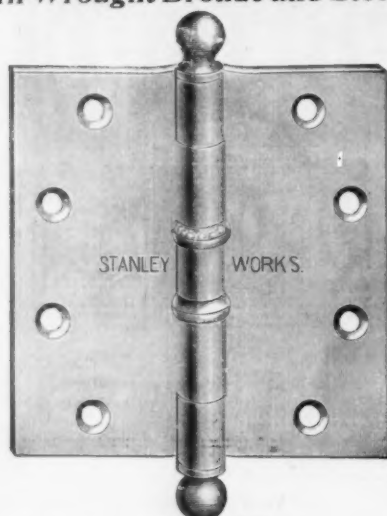
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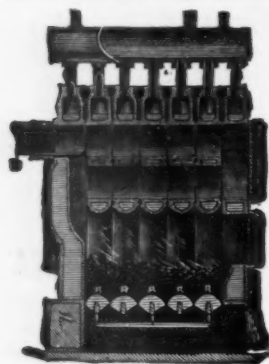
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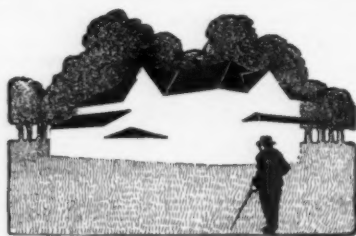
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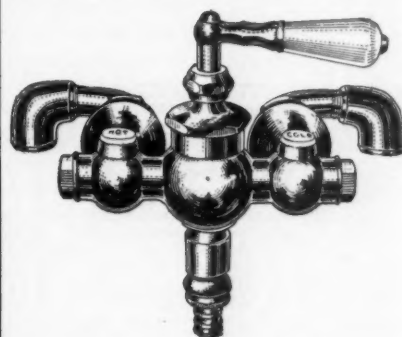


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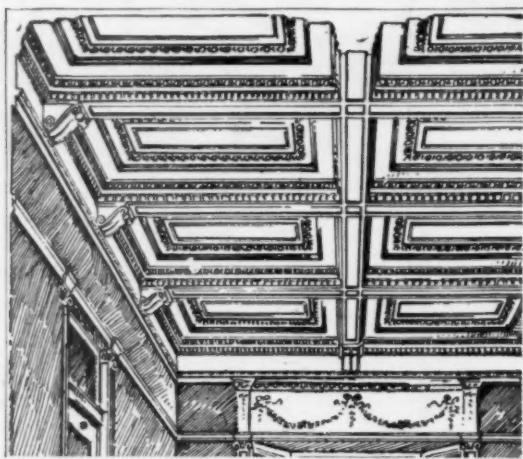
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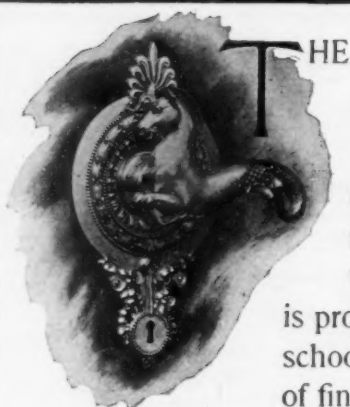
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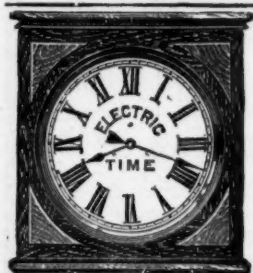
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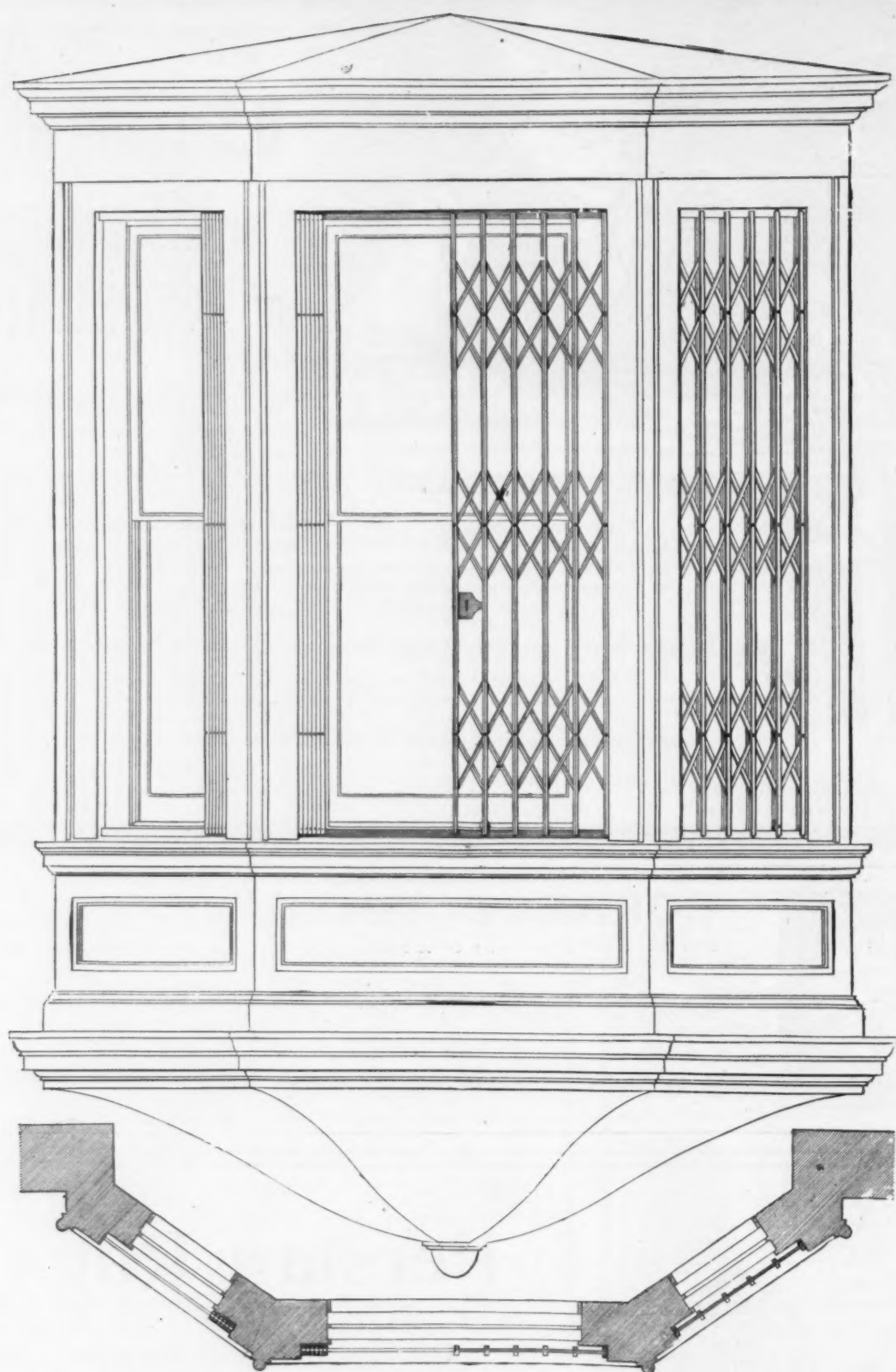
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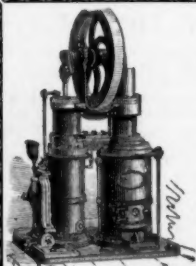
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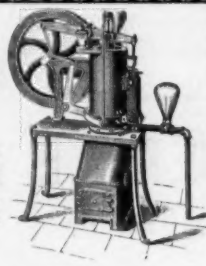
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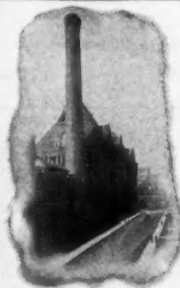
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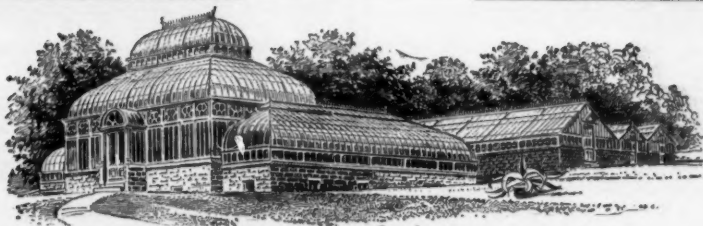
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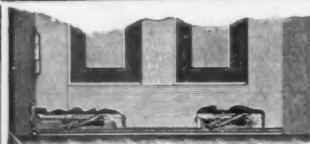
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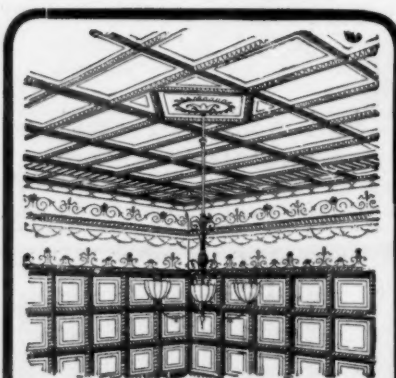
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facturers to adopt the now common practice of illuminating a business announcement in the advertising pages of a periodical with illustrations of the buildings in which the advertisers' wares had been used, the illustrations being ordinarily made after drawings made by the architects of the buildings, drawings which were willingly furnished because Mr. Cabot was always scrupulous to give full credit to the designer of the building, and architects, however much they may protest that advertising is outside of the limit of professional propriety, are never averse to seeing their names published in connection with the work of their hands.

But in the course of years it became easy to procure photographs of the buildings, and recently Mr. Cabot has used for his illustrations half-tone cuts made from nature, and now he has gathered into the pages of a six-

teen-page pamphlet a hundred or so of these cuts, together with accompanying testimonials from architects and owners, and this pamphlet he will be glad to send any one on request—and the request is worth making.

THE American Blower Co., of Detroit, Mich., reports business excellent in all its lines. Among the larger orders recently received they mention heating and induced-draught apparatus for the Ironton (O.) Engine Co.; drying outfits for the Illinois Sugar Refinery Co., to be installed at Pekin, Ill., and the Michigan Starch Co., to be used in their Traverse City plant; dry kilns for the Mengel Box Co., of Louisville, Ky.; Brooklyn Cooperage Co., of New York; Buckstegen Furniture Co., Evansville, Ind.; Evansville (Ind.) Desk Co.; Cadillac Cabinet Co., Detroit, and many others.

The American Architect and Building News

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New Advertisements.

AMERICAN TIN PLATE CO. (New York, N. Y.), Roofing Tin. Page v.
THE BROWN HOISTING MACHINERY CO. (New York, N. Y.), Fireproofing. Page xv.
WILLIAM CURTIS & YAN (Boston, Mass.), Insurance. Page lii.

See last or next issue for the following advertisements:—

Chicago & Alton Railway.
Crawford Specialty Co.
Cadell, F. E.
Charles J. Jager Co.
Grant Pulley & Hardware Co.
Kearney & Mattison Co.
Morse, Williams & Co.
Northern Engineering Works.
Redding, Baird & Co.
Standard Sanitary Mfg. Co.
Thorn Co., J. S.
Wisconsin Graphite Co.

ARCHITECTS' REMOVALS, Etc.

MR. HERBERT W. FOLTZ, architect, announces the removal of his offices to the Union Trust Building, Rooms 28-31, Indianapolis, Ind. 1432

CHARLES F. BALDWIN, architect, has removed to the Exchange Building, 45 Clinton St., Newark, N. J.

MESSRS. RANKIN & KELLOGG announce that Mr. Edward A. Crane has been admitted to partnership under the firm name of Rankin, Kellogg & Crane, 1012 Walnut St., Philadelphia. June 1, 1903.

FOR SALE.

PRACTICE FOR SALE.—Architect's business for sale, New York City, 10 years' practice, complete office furniture, drawings, etc., good clientage, reasonable terms. "Box," care American Architect. 1433

WANTED.

SUMMER POSITION.—Wanted by draughtsmen of ten years' experience, school graduate, position for summer months in a Boston office. Address "A. D.," care American Architect. 1432

WANTED.

PARTNER.—An architect, thoroughly competent, desires to form a copartnership with an architect or engineer possessing ability, or would assume a position in any office as draughtsman or as supervisor of instruction. At liberty June 1st. Would exchange references. Address "I-Beam," American Architect. 1432

BUILDING INTELLIGENCE.

(Reported for the American Architect and Building News.)

[Although a large portion of the building intelligence is provided by their regular correspondents, the editors greatly desire to receive voluntary information, especially from the smaller and outlying towns.]

ADVANCE RUMORS.

Ambridge, Pa.—Bids will be received for the erection here of 40 brick dwellings by J. K. Graham, superintendent of the Keystone branch of the American Bridge Co., Pittsburgh.

Anderson, S. C.—It is reported that Capt. J. M. Brown is interested in a movement to build a \$500,000 cotton factory.

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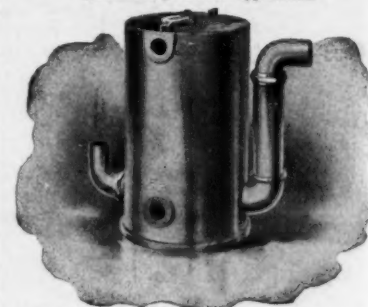
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William H. Sayward, Secretary of The National Association of Builders, 166 Devonshire St., Boston, Mass.

BUILDING INTELLIGENCE.

(Advance Rumors Continued.)

Austin, Tex.—John Andrewartha has prepared plans for a \$65,000 residence to be erected for Mrs. L. C. Pense, to be built of rock and brick, with structural, cast and sheet iron, plumbing, steel joist hangers, deadening felt, metal ceilings and ventilators.

Boston, Mass.—The trustees of the House of the Good Samaritan have bought an estate on the corner of Francis and Binney Sts., next the site for the new Harvard Medical School building, and they propose to erect on the site a handsome hospital, removing from the present location at the corner of Chambers and McLean Sts. The architects are Shepley, Rutan & Coolidge.

The land on the northerly side of the Westland Ave. entrance to the Fenway is shortly to be improved by the erection of a model apartment building. Plans are being drawn for a structure which is to cover the entire lot, excepting a central court, and is to be only four stories in height, containing but four apartments, one to each floor, one of which is to be occupied by the owner. These apartments will each contain a large number of spacious rooms.

Brookview, Pa.—Plans have been drawn by Robinson & Winkler, Pittsburgh, for the new \$40,000 Presbyterian Church.

Camden, Ark.—The Camden Commercial League is promoting a movement for the erection of a cotton-mill to be capitalized at \$50,000.

BUILDING INTELLIGENCE.

(Advance Rumors Continued.)

Camden, N. J.—Efforts are being made toward the erection of a cotton factory here. Committees are securing subscriptions, and quite a portion of the \$50,000 required has already been pledged.

Carthage, O.—A new laundry building is to be erected at a cost of \$20,000 for the Longview Asylum. Address Supt. Harman.

Cincinnati, O.—Mrs. A. B. Coney will erect on McMillan Ave. a \$25,000 brick flat building with apartments for eight families.

Clinton, Ia.—Report states that the Y. M. C. A. will erect a \$60,000 building.

Clinton, S. C.—The Lydia Cotton Mills will expend \$100,000 to enlarge its plant. Additional buildings will be erected at once.

Davenport, Ia.—The Orpheum Theatre is to be remodelled this summer at a cost of \$18,000. D. J. Harist has drawn plans.

G. A. Hansen has plans for a seven-story building, 60' x 100', for the Schick Transfer & Express Co. Cost, \$25,000.

Dorchester, Mass.—A block of stores and apartments will be erected in Talbot Ave. and Norfolk St. for the Jackson estate from plans by H. J. Preston. The block will be 60' x 120' and four stories high, and will contain 12 suites of apartments and three stores. Estimated cost, \$45,000.

Dethan, Ala.—About \$20,000 will be spent by Henry

Architects, Attention!

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BUILDING INTELLIGENCE.

(Advance Rumors Continued.)

County for the construction of a new jail building. Andrew J. Bryan & Co., New Orleans, La., archt's.

Grand Rapids, Mich. — Mr. C. E. Blodgett, of Marshfield, Wis., is interested in the erection here of a \$650,000 hotel.

Grinnell, Ia. — A new high school is to be erected at this place at a cost of \$40,000.

Jersey City, N. J. — Mayor Fagan denies that the new hospital project has been abandoned, as has lately been reported. It is delayed because the validity of the act authorizing the bonds for the erection of the hospital has been attacked, and the matter is now pending in the courts.

BUILDING INTELLIGENCE.

(Advance Rumors Continued.)

Kokomo, Ind. — The Alhambra Association will build a coliseum in this city.

La Crosse, Wis. — The Northern Hotel Co. has received plans for the proposed \$200,000 hotel. Will be five-story, containing 150 rooms. Bids will be received at once.

Milton, Mass. — Foundations have been laid for the erection of the large and attractive dwelling for Ralph E. Forbes in Adams St. The plans for the house show a three-story building, with a broad frontage, to be constructed of brick and stone. It will cost \$35,000 above the land.

Milwaukee, Wis. — It is stated that the Milwaukee Railroad Co. will erect a new double turnstile, con-

BUILDING INTELLIGENCE.

(Advance Rumors Continued.)

crete and steel bridge at a cost of \$100,000 across the river east of Reed St.

WANTED.

DRAUGHTSMAN. — A prominent New York architect doing work of a monumental character, requires a draughtsman of technical training and experience in best offices, well posted on construction, a fair designer and competent to make complete working drawings of high class work. State particulars as to training, experience and salary required. Address "Projet," care H. M. Carleton, 5 Beekman St., New York. 1434

WANTED.

DRAUGHTSMEN. — Wanted, first-rate architectural draughtsmen of experience. Address Alden & Harlow, architects, Pittsburgh, Pa. 1435

COMPETITIONS.

HIGH SCHOOL. [At Plainfield, N. J.] The Board of Education of the City of Plainfield, N. J., will send the conditions governing a competition for the purpose of selecting an architect for the above building to any architect requesting the same before June 10th, 1903. Address F. B. CLARK, Clerk of the Board of Education, Plainfield, N. J. 1432

PROPOSALS.

Treasury Department, Office of the Supervising Architect, Washington, D. C., June 2, 1903. Sealed proposals will be received at this office until 3 o'clock P. M. on the 24th day of June, 1903, and then opened, for the construction of a gallery and cases for plates and dies in the new plate vault at the Bureau of Engraving and Printing, Washington, D. C., in accordance with the drawing and specification, copies of which may be had at this office at the discretion of the Supervising Architect. JAMES KNOX TAYLOR, Supervising Architect. 1433

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Many of the most eminent chemists and painters of the country to-day admit that there is no painting compound that will last like silex, zinc and lead ground in strictly pure linseed oil. Pure lead alone chalks quickly; lead and zinc will flake or peel;

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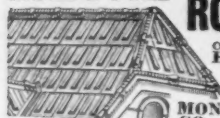
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because the sides, front and bottom are made of EXPANDED METAL which will not permit the accumulation of dirt and dust, and can readily be washed with a hose.

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because they are built to fit any curve or corner. Each one contains a shelf and three brass hooks.

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because when the door is locked no human pressure can force apart the metal mesh.

Write for booklet and list of enterprising houses now using them.

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PROPOSALS.

OFFICERS' QUARTERS, ETC.

[At Fort Ethan Allen, Vt.]
Office Constructing Q. M., Burlington, Vt. Sealed proposals will be received until June 15, 1903, for constructing, heating, plumbing, gas-piping and electric wiring of two sets field officers' quarters, two double sets captains' quarters, three double sets lieutenants' quarters and two double cavalry barracks, constructing and plumbing of four cavalry stables and construction of two field artillery shop buildings, two double cavalry stable guard-houses, one quartermaster's storehouse and one magazine at Fort Ethan Allen, Vt. Information furnished on application. CAPTAIN T. B. LAMOREUX, Q. M. 1432

HOSPITAL.

[At Hamilton, O.]
Bids will be received until June 15 at the Mercy Hospital for the construction of a new hospital building according to plans by Architect George W. Barkman, Hamilton. 1432

CONSTRUCTION.

[At Sandusky, O.]
The board of trustees of the State Soldiers' Home will receive bids until June 18 for constructing the improvements in the administration building, domestic building, hospital building and the engine room. Frank L. Packard, New Haven Block, Columbus, O., architect. THOMAS T. DILL, secretary. 1432

JAIL AND RESIDENCE.

[At Two Harbors, Minn.]
Bids will be received until June 16 for the erection of a county jail building and sheriff's residence. Certified check, 5 per cent. JOHN P. PAULSON, County Auditor. 1432

ORPHANS' HOME.

[At Muscatine, Ia.]
Bids will be received until June 30 for the construction of a three-story brick and stone orphans' home to be built near this city. H. W. Zeidler, 107 W. 2d St., architect. 1432

CHURCH.

[At Rossville, Ill.]
Bids will be received until June 15 for the erection of a brick church for the First Methodist Episcopal congregation by the chairman of the building committee, F. L. Stewart, of the First M. E. Church. Plans by Architect J. M. Deal. 1432



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PROPOSALS.

OFFICERS' QUARTERS, ETC.

[At Danville, Ill.]
Sealed proposals will be received at office of Treasurer, Danville Branch, N. H. D. V. S., Danville, Ill., until June 15, 1903, for furnishing material, labor, etc., for erecting complete a building for officers' quarters, and the heating and ventilating apparatus, plumbing apparatus, electric-lighting apparatus, etc., in said building, at Danville Branch, N. H. D. V. S., in accordance with instructions, plans and specifications, copies of which, with blank proposals and other information, may be had upon application to MAJOR M. J. BARGER, Treasurer. 1432

BANK BUILDING.

[At Houston, Tex.]
Bids are wanted June 15 for erecting a six-story fireproof bank building for the Commercial National Bank. Green & Szasz, architects, 211-16 Mason Block. 1432

REPAIRING SCHOOLS.

[At Dayton, O.]
Bids will be received June 18 by the Bd. of Educ. for furnishing material and repairing various schools, work to include cement, galvanized iron and corrugated ironwork, repairs to boilers and furnaces, castings for furnaces, wrought-iron work, etc. WM. G. HAEUSSLER, Chf. 1432

LIBRARY BUILDING.

[At Sauk Center, Minn.]
The Bryant Library Association, of Sauk Center, Minn., will receive bids until June 13 for the erection of a library building. Plans and specifications may be seen on file in the office of M. Hogan, Sauk Center, and Charles R. Aldrich, architect, 606 Lumber Exchange, Minneapolis. GEORGE A. STANTON, Secretary. 1432

BANK.

[At Dunkerton, Ia.]
Bids are wanted June 15 for erecting a brick building for the First National Bank. Murphy & Ralston, architects, Waterloo. 1432

GYMNASIUM.

[At Fort Douglas, Utah.]
Bids are wanted June 15 for constructing a post exchange and gymnasium building, including plumbing, gas piping, heating and electric wiring, at Fort Douglas. CAPT. SAM V. HAM, Q. M., Salt Lake City, Utah. 1432

PROPOSALS.

CONSTRUCTION.

[At Annapolis, Md.]
Bids will be received June 13 by H. C. Taylor, Ch. of Bureau of Navigation, Navy Dept., Washington, D. C., for constructing officers' quarters at the U. S. Naval Academy, Annapolis. 1432

MASON, CARPENTRY WORK, ETC.

[At Boston, Mass.]
The School-house Commissioners of Boston invite proposals for doing masonry, carpentry and other work in the Bowditch School, Green St., Jamaica Plain District, Boston, Mass., and giving bond of a surety company therefor in \$2,000; also proposals for installing a plumbing system in said building and giving bond of a surety company therefor in \$2,000. Only proposals obtained at the office of the Commissioners, 120 Boylston St., signed by the bidder and left before 12 M. of Monday, June 8, 1903, at said office, with a certified check for \$500, payable to the city if the proposal is not carried out, will then and there be publicly opened and read. The Commissioners reserve the right to reject any and all proposals and to give preference to bidders paying the trades unions' rate of wages. R. CLIPSTON STURGIS, JOHN H. COLBY, FREDERIC O. NORTH, Commissioners. 1432

MASON, CARPENTRY WORK, ETC.

[At Boston, Mass.]
The School-house Commissioners of Boston invite proposals for doing masonry, carpentry and other work in the Old Dorchester High School, Centre St., Dorchester District, Boston, Mass., and giving bond of a surety company therefor in \$3,000; also proposals for installing a plumbing system in said building and giving bond of a surety company therefor in \$3,000. Only proposals obtained at the office of the Commissioners, 120 Boylston St., signed by the bidder and left before 12 M. of Tuesday, June 9, 1903, at said office, with a certified check for \$500, payable to the city if the proposal is not carried out, will then and there be publicly opened and read. The Commissioners reserve the right to reject any and all proposals and to give preference to bidders paying the trades unions' rate of wages. R. CLIPSTON STURGIS, JOHN H. COLBY, FREDERIC O. NORTH, Commissioners. 1432

COURT-HOUSE.

[At Boonville, Ind.]
Bids are wanted July 1 for erecting a court-house. Harris & Shephell, architects, Evansville. 1433

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PROPOSALS.

SCHOOL.

[At New Lexington, O.] Bids will be received until June 21 at the office of the clerk of the board of education, of Pike township, for the building of a school-house on a lot on Bear Run in district No. 5. C. K. WAGNER, clerk of the board. 1433

CELLS, WINDOW-GUARDS, ETC.

[At Hammond, Ind.] The board of commissioners, Crown Point, Ind., will receive bids until June 20 for two steel cells, window-guards and cell-doors for cell-room and finishing up cell-room in the superior court building at Hammond. MICHAEL GRIMMER, Crown Point, clerk. 1433

GREENHOUSE.

[At Danville, Ill.] Sealed proposals will be received at the office of the Treasurer, Danville Branch, N. H. D. V. S., Danville, Ill., until June 18, 1903, for furnishing materials, labor, etc., for erecting, complete, a greenhouse, and the heating apparatus, etc., in said building, at Danville Branch, N. H. D. V. S., in accordance with instructions, plans and specifications, copies of which, with blank proposals and other information, may be had upon application to MAJOR M. J. BARGER, Treasurer. 1433

COURT-HOUSE.

[At Yankton, S. D.] Sealed bids will be received by the Board of County Commissioners of Yankton County, S. D., for the erection and completion of a new court-house on the court-house grounds at Yankton, S. D., and for the heating and plumbing thereof. Bids will be received separate for the building and the heating and plumbing. Bids will be addressed to C. L. LAWRENCE, Auditor, Yankton, S. D., until June 23, 1903. 1433

PORTICOES.

[At Preston, Minn.] The County Commissioners of Fillmore County will receive proposals for porticoes on the north and south sides of the court-house in Preston, not later than July 15, 1903. All bidders to furnish their own plans and specifications. Photograph of building and measurements furnished on application to the county auditor. J. F. JONES, County Auditor, Preston, Minn. 1434

CONSTRUCTION.

[At New Orleans, La.] Bids will be received June 27 by Mordecai T. Endicott, Ch. of Bureau of Yards and Docks, Navy Dept., Washington, D. C., for constructing at the Naval Station, New Orleans, the following: Two-story brick office-building, appropriation \$30,000; also a two-story brick and steel building for equipment. Limit of cost, \$80,000. 1434

ROADS.

[At Fort Caswell, N. C.] Sealed proposals will be received here until June 16, 1903, for constructing roads, Fort Caswell, N. C. Information furnished on application. PHILIP YOST, A. A. Q. M. 1432

HOSPITAL.

[At Los Angeles, Cal.] Bids are wanted by the Bd. of Superv. June 16 for erecting the brick and stone county hospital buildings. Wm. Moser, archt. 1432

PIER WORK.

[At Saugatuck, Mich.] U. S. Engineer Office, Grand Rapids, Mich. Sealed proposals for pier construction at Saugatuck, Mich., will be received here until June 17, 1903. Information furnished on application. M. B. ADAMS, lieut. col., engr. 1432

SCHOOL.

[At Scotch Ridge, O.] The board of education will receive proposals until June 15 for the erection of a school-building in district No. 9. 1432

SEA WALL.

[At Annapolis, Md.] Proposals will be received at the Bureau of Navigation, Navy Department, Washington, D. C., until June 17, 1903, for a sea wall at the U. S. Naval Academy, Annapolis, Md. Blank forms of proposal specifications, and plans will be furnished on application to the bureau of navigation, Navy Department, Washington, D. C., or at the U. S. Naval Academy, Annapolis, Md. H. C. TAYLOR, chief of bureau. 1432

PROPOSALS.

Treasury Department, Office of the Supervising Architect, Washington, D. C., May 23, 1903. Sealed proposals will be received at this office until 2 o'clock P. M. on the 15th day of June, 1903, and then opened for the installation and maintenance of an electrical burglar alarm device on certain vaults and safes in the U. S. Treasury building, Washington, D. C., which device must be connected with a central station in this city. A copy of the general information regarding the service required, etc., may be obtained upon application to this office. JAMES KNOX TAYLOR, Supervising Architect. 1432

PAVING.

[At Bridgeport, Conn.] Sealed proposals will be received by the Street Committee of the Common Council of Bridgeport, Conn., at Room 10, City-hall, until June 12, 1903, for furnishing and laying about 4,100 square yards of brick, wood, or bituminous macadam pavement. Specifications, including form for bid, may be had by addressing H. G. Scofield, City Surveyor. E. T. BUCKINGHAM, Clerk. 1432

DRAINAGE SYSTEM.

[At Lawrence, Kan.] Bids will be received June 12 by the Comrs. of Indian Affairs, Dept. of Interior, Washington, D. C., for furnishing material for constructing a tile drainage system and extending the sewer at Haskell Ins. For further information, apply to H. B. PEAIRS, Supt. of Ins. 1432

ADDITIONS.

[At Sandusky, O.] Bids will be received until June 18 by Frank L. Packard, archt., Columbus, for furnishing material and making alterations and additions to the sanitary appliances and also additions to buildings at the Ohio Sailors' and Soldiers' Home at Sandusky. 1432

DWELLINGS.

[At Kentucky River, Ky.] U. S. Engineer Office, Custom-house, Cincinnati, O. Sealed proposals for furnishing all labor and materials for constructing two lock tenders' dwellings at Lock No. 11, Kentucky River, Ky., will be received here until June 18, 1903. Information furnished on application. LIEUT. COL. ERNEST H. RUFNER, engr. 1432

PROPOSALS.

FIREPROOFING.

[At Augusta, Me.] Bids are wanted June 12 for fireproofing and refurnishing the 3d and 4th floors of south wing of State Capitol, Augusta. COL. E. C. STEVENS, Supt. Pub. Bldgs. 1432

ADDITIONS TO BUILDING.

[At Salem, Ore.] Proposals will be received until June 21 for alterations and additions to the industrial building and main building of the State reform school by the board of trustees at the State Capitol. 1432

FIRE-STATION.

[At Houston, Tex.] Proposals will be received by the mayor until June 22 for the erection of a central fire-station to cost about \$30,000. 1432

COURT-HOUSE.

[At La Grange, Ga.] Proposals for the erection of a court-house will be received by the county commissioners until July 13. 1433

JAIL.

[At Napoleon, N. D.] The board of county commissioners will receive proposals until July 8 for the erection of a jail. 1433

BUILDING.

[At New Orleans, La.] Sealed proposals will be received at the Bureau of Yards and Docks, Navy Department, Washington, until June 27, 1903, for constructing a two-story brick office-building at the naval station, New Orleans, La. Appropriation, \$30,000. Plans and specifications can be seen at the navy yard named, or will be furnished by the Bureau upon deposit of \$20 to secure their return. MORDECAI T. ENDICOTT, chief of bureau. 1433

SEWERS.

[At Washington, D. C.] Sealed proposals will be received until June 20 for constructing sewers in certain streets. Specifications and blank forms of proposals may be obtained at this office. HENRY B. F. MACFARLAND, et al., commissioners, D. C. 1432

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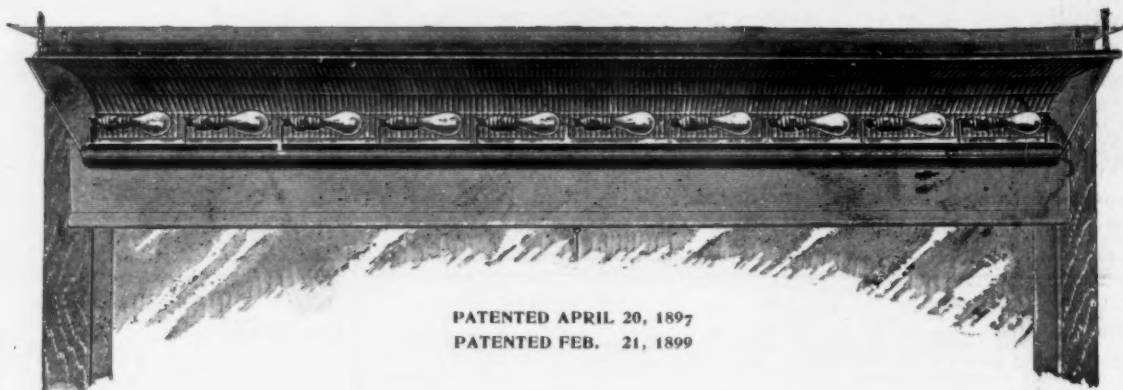
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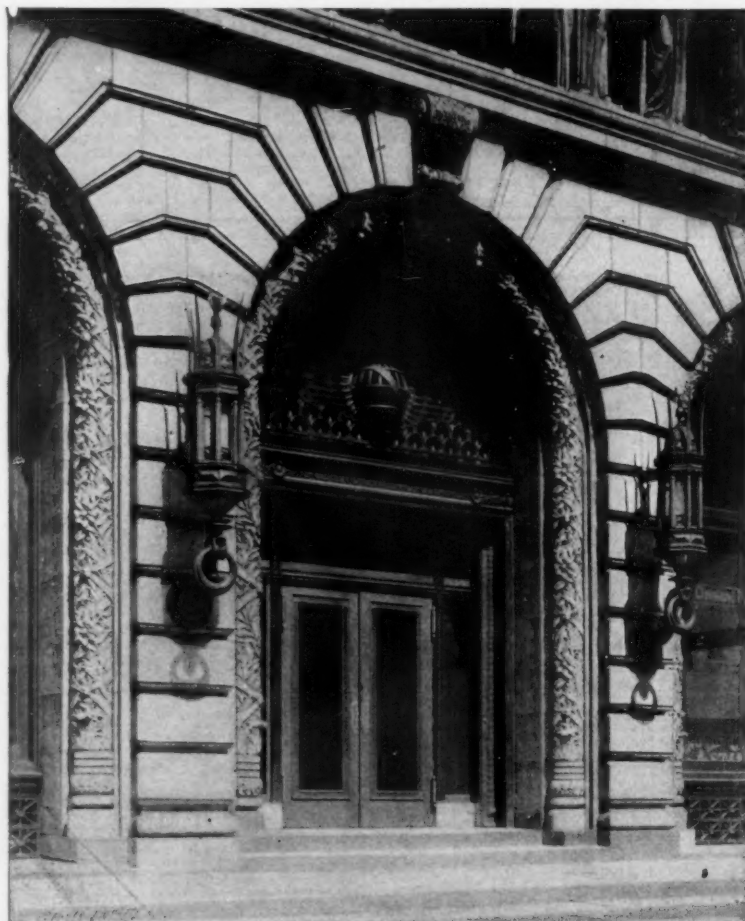
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. . . 1895. . .

SECTION 1. No Member should enter into
partnership, in any form or degree, with any
builder, contractor, or manufacturer.

SECTION 2. A Member having any ownership
in any building material, device or invention,
proposed to be used on work for which he is
architect, should inform his employer of the
fact of such ownership.

SECTION 3. No Member should be a party to
a building contract except as "owner."

SECTION 4. No Member should guarantee an
estimate or contract by personal bond.

SECTION 5. It is unprofessional to offer draw-
ings or other services "on approval" and
without adequate pecuniary compensation.

SECTION 6. It is unprofessional to advertise in
any other way than by a notice giving name,
address, profession, and office hours, and
special branch (if such) of practice.

SECTION 7. It is unprofessional to make altera-
tions of a building designed by another archi-
tect, within ten years of its completion,
without ascertaining that the owner refuses to
employ the original designer, or, in event
of the property having changed hands, with-
out due notice to the said designer.

SECTION 8. It is unprofessional to attempt
to supplant an architect after definite steps
have been taken toward his employment.

SECTION 9. It is unprofessional for a Member
to criticise in the public prints the professional
conduct or work of another architect except
over his own name or under the authority of
a professional journal.

SECTION 10. It is unprofessional to furnish de-
signs in competition for private work or for
public work, unless for proper compensation,
and unless a competent professional adviser
is employed to draw up the "conditions" and
assist in the award.

SECTION 11. No Member should submit draw-
ings except as an original contributor in any
duly instituted competition, or attempt to
secure any work for which such a competition
remains undecided.

SECTION 12. The American Institute of Archi-
tects' "schedule of charges" represents mini-
mum rates for full, faithful and competent
service. It is the duty of every architect to
charge higher rates whenever the demand for
his services will justify the increase, rather
than to accept work to which he cannot give
proper personal attention.

SECTION 13. No Member shall compete in
amount of commission, or offer to work for
less than another, in order to secure the work.

SECTION 14. It is unprofessional to enter into
competition with or to consult with an archi-
tect who has been dishonorably expelled from
the "Institute" or "Society."

SECTION 15. The assumption of the title of
"Architect" should be held to mean that the
bearer has the professional knowledge and
natural ability needed for the proper invention,
illustration and supervision of all building
operations which he may undertake.

SECTION 16. A Member should so conduct his
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sional education and render all possible help
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