# THE AMERICAN ARCHITECT AND BUILDING NEWS.

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Entered at the Post-Office at Boston as second-class matter.

APRIL 3, 1897.


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THE Managing Committee of the American School of Classical Studies in Rome offers this year three fellowships, two of six hundred dollars, and one of five hundred. The holders of the fellowships must pursue their studies, under the supervision of the Director of the School, for ten months, beginning October 1, 1897, in Italy or Greece, and each is required to select some special subject of investigation, and present a paper giving the results of his work. Candidates must be Bachelors of Arts of universities or colleges, or must possess equivalent qualifications, and are required to submit a statement of their work as students, and copies of any papers which they may have written in the course of their studies. Blank forms of application may be obtained from Professor C. L. Smith, 64 Sparks Street, Cambridge, Mass., or from Professor Minton Warren, Via Gaeta 2, Rome, the present Director of the School, and must be returned to Professor Smith by May 1, 1897.

THE defence of American art against the mistaken policy of excluding, by tariff taxation, foreign pictures and statues, has enlisted the efforts of many of the best men in the country. Mr. Henry G. Marquand, of New York, to whose unceasing effort, and limitless generosity, is due, more, perhaps, than to any other influence, the development which has brought American art from an object of just ridicule to a promising rival of the best that the world can show, protests earnestly against the revival of the restrictions which the artists of the country were themselves, a few years ago, most active in having removed; and the cause of the people has been, within a few days, ably pleaded in Congress by representatives of both parties. It seems hardly possible that, even if enacted, the law imposing such restrictions could long endure the adverse public opinion which has already expressed itself effectually against them, but it would be far better to avoid altogether the check to artistic progress which, even if temporarily imposed, would work much harm to thousands of American students of art who must, within the next four years, acquire the judgment and technical skill which will be their professional capital during their lives, and which, under present circumstances, can only be acquired by the study of the work of the great foreign masters which the generosity of their fellow-citizens places within their reach.

INDICATIONS point this year to early and severe struggles between the labor unions, or rather the men who at present control them, and the people who do not belong to them, including both the non-union workmen and the general public. There is no question that the power of the union leaders is slipping away; the position assumed by the courts in regard to conspiracies to deprive men of employment; the decided action taken by the members of the unions themselves, who have, in several cases, adopted by large majorities rules excluding from membership professional socialists, and others not recognized as being actually skilled members of the trade, and forbidding participation in "sympathetic" strikes; and the unwonted boldness with which politicians have begun to take the part of ordinary citizens against the demands of "organized labor," all point to a reaction against the domineering demagogism which, not long ago, seemed about to abolish every vestige of private rights. It is not likely that a system under which ambitious "organizers" can use great armies of obedient followers to make war on private and public interests will be willingly abandoned by those who profit by means of it; and if a desperate struggle appears to the demagogues desirable to restore their revenues and influence, such a struggle will certainly be provoked in some way. Already, nearly fifty thousand men, in the busiest part of the building season, following a winter of idleness and hardship, are on strike in New York, to enforce a demand made by the Board of Walking-delegates, that the installation of thermostats, which now employs a handful of men specially trained for the work, shall be taken away from them, and committed exclusively to union steam-fitters, whose training qualifies them for such business about as well as a machinist's education fits him for watch-making. It is obvious that the fifty thousand striking workmen, with the one or two hundred thousand women and children dependent on them for support, and the hundreds of thousands more whom the suspension of building operations deprives indirectly of employment, know nothing, and care nothing, about the merits of the dispute, but the power of the walking-delegates to enforce their arbitrary demands is in question, and their unfortunate constituents must pay for the contest which is to decide the matter.

MR. CHARLES ELIOT, a distinguished landscape-architect of Boston, died a few days ago. Mr. Eliot, a son of President Eliot, of Harvard University, after a liberal general training, devoted himself to landscape design as a profession, in pursuance of an inclination which he had long cherished. He studied long and earnestly, both in this country and abroad, and began practice with an admirable equipment of skill and knowledge. The adoption by the City of Boston of the scheme for a Metropolitan Park System, which was mainly due to Mr. F. L. Olmsted, gave an admirable opportunity for utilizing Mr. Eliot's exceptional qualifications, and, as the associate and friend of the Messrs. Olmsted, he had a most important part in this great work.

*GARDEN AND FOREST* calls attention to the fact that the law by which the forests on the public lands, by which the sources of important western rivers are supplied, have been set apart as forest reservations, is in great danger of being abrogated, in the interest of a few persons, who wish to be free to cut away the timber, burn it off, to expose the rock, for prospecting for minerals, or in other ways to destroy the patrimony of the nation for their private advantage. Soon after the publication of President Cleveland's proclamation, adding twenty-one million acres to the public forest reservations, the Senate, near the end of a long night session, adopted an amendment to the Sundry Civil bill, proposed by Senator Clark, of Wyoming, which said, "And all the lands in the States of Wyoming, Utah, Colorado, Montana, Washington, Idaho and South Dakota, set apart and reserved by Executive orders and proclamations of February 22, 1897, are hereby restored to the public domain, and subject to settlement, occupancy and entry, the same as if said Executive orders and proclamations had not been made." It will be observed that the two great forest reservations in California are excluded from the amendment, and *Garden and Forest* is informed that this was done at the request of the two Senators from California; but no one seems to have taken the part of the settlers on the river lands of the other States, to whom the loss of the mountain forests means the loss of their property and their living, and the amendment passed easily.

WHETHER the passage of an amendment to an appropriation bill, directly annulling a proclamation of the President, issued six days before, in conformity with the established laws of the United States, was helped by the well-known incompatibility of temper which had long existed between the Senate and the Executive, we will not undertake to say; but the House, probably with better intentions, but not, as *Garden and Forest* thinks, with better judgment, amended the Senate amendment, by retaining the reservations, in accordance with President Cleveland's proclamation, but authorizing the Secretary of the Interior to sell timber from them or from any other of the public forests, and opening them to the location of mining claims, and, under certain restrictions, to settlement. This plan might not be very objectionable, if the Department of the Interior possessed facilities for cutting timber with judgment, and for controlling mining prospectors and land-grabbers; but, in point of fact, it has no such facilities, and the best intentions on the part of the Secretary could not prevent irreparable waste and maltreatment of the forests. Fortunately, in the conference which ensued between the House and Senate committees, both sides receded from their amendments, and agreed upon a comparatively inoffensive provision, authorizing the President at any time to modify any executive order that might have been made establishing forest reserves. In this form the amendment passed both Houses, but the Sundry Civil bill failed to receive the President's signature, and the amendment of course failed with it. Whether the attacks on the forests will be continued in the present Congress remains to be seen, but *Garden and Forest* deserves the thanks of the community for calling attention to the danger.

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BOSTON has decided to lay a salt-water pipe-line, for fire-protection only, in a portion of the city containing many warehouses and office-buildings, and regarded by fire-engineers as presenting special hazards. According to the plan now adopted, a twelve-inch pipe is to be laid through Congress Street, Exchange Place, Central Street and Atlantic Avenue, to Central Wharf, communicating with the harbor at the Congress-Street bridge. In case of fire in the district near the line of pipes, the city fire-boat is to be utilized to force water into the pipe, and special hydrants will render the new supply available for the fire-engines.

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A PATENT has been taken out by Dr. Askenasy, of Switzerland, for a very peculiar method of glazing or enamelling porcelain, earthenware, and the like. The process is, in the description, simple enough, consisting in "painting," as the German papers tell us, the surface of the object to be glazed with an "electric arc." The idea of using an electric arc as a paint-brush is certainly a novel one, but the description lacks details in regard to the kind of handle employed for the brush, and the mode in which the arc, which is of a highly inconstant character, is kept in operation during the process. With these matters explained, it may be conceded that the new method affords facilities for melting the substances intended as a glaze to the surface. It seems, however, that the advantages of the system are not confined to the ornamentation of pottery, for it can be employed, as we are told, in making "fireproof ovens" for burning ware of the kind. All that is necessary, after the oven has been built up with firebrick in kaolin cement, in the usual way, is to walk around inside it, painting it over with an electric arc, which immediately melts bricks, joints and all into a solid mass.

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EVERY student of German history, or rather, of German poetry, knows that the Emperor Frederick Barbarossa, instead of taking his place comfortably in Valhalla, prefers to sit in a cave under the Kyffhaüser Mountain, where, apparently, he contents himself with doing nothing in particular, beyond alarming the credulous citizens who happen to penetrate accidentally within sight of his red beard. Unfortunately, the citizens who enjoy a glimpse of the fierce old Emperor leave his presence so hastily that they forget how to return, and thus it happens that the good Germans who would like to pay their respects to the progenitor of the Hohenstaufens are unable to do so, while the people who are, unintentionally, successful in reaching his presence, are apt to be such as the Red-Beard would not, in life, have looked upon with much favor. In consideration of these circumstances, the citizens by whose efforts the monument to the late Emperor has been raised upon the Kyffhaüser have added to it a reminder of the great Barbarossa, in materials more substantial than those hitherto presented to his visitors, in the shape of a "Barbarossa Court," which forms a portion of the monumental group, and is so contrived that the visitor, penetrating through a deep, vaulted passage, sees suddenly in front of him, across a small open court, the statue of Barbarossa, illuminated by the bright daylight of the court, and relieved against the shadows of the deep arched recess, at the front of which he sits. The effect, as shown in a photograph reproduced in the *Deutsche Bauzeitung*, is extremely picturesque and striking, and the professional man will certainly reflect that similar management might lend much charm to other monuments. The Germans are particularly skilful in arranging picturesque combinations, and we could hardly expect to surpass them in such work; but between the Kyffhaüser group and the average American "soldier's monument," with its figure in regimentals, standing patiently in the sun in front of the band-stand in the "Park," there is a wide interval to be filled; and, if our patriotic communities cannot always command money enough to purchase statues of soldiers with legs of equal length, it is always possible to place such statues as are available in positions in which they will show to advantage, and a little care for this point will be well repaid.

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A BALLOON was recently sent up from Paris, which reached a height of at least fifteen thousand metres, or about nine miles. No one took the journey with it, but the car contained a collection of self-registering scientific instruments, the records of which will be compared and deciphered at leisure. The self-registering barometer showed very clearly the ascent to ten thousand metres. After this the curve traced by the instrument became somewhat confused, but it could be read with sufficient distinctness to fifteen thousand. The volume of gas employed had been carefully calculated, in such a way that, at normal temperatures, the balloon would reach equilibrium at thirteen thousand metres above the ground. It was presumed that the heat of the sun would expand the gas to a certain extent, and the variation between the maximum recorded height and thirteen thousand metres would, therefore, measure the expansion, and indicate the heat received from the sun. Of course, this heat was counterbalanced to some extent by the fall in the atmospheric temperature, which was considerable, the self-registering thermometer showing a minimum temperature of eighty-seven degrees below zero, Fahrenheit; so that a certain amount of calculation will be needed to ascertain the net effect of the sun's rays. The height of the barometer at the extreme altitude was only five and one-half inches, indicating that animal life would be impossible there. Apparatus was provided for collecting some of the surrounding air at the extreme altitude, for analysis, but it does not appear that the analysis has yet been made.

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AN international competition was recently held, for designs for a theatre in Kiew. We imagine that a good many of our readers would be puzzled to say where Kiew is, but it seems that it is a place of sufficient importance to invite the architects of the world to compete for its buildings, and to pay them quite liberally for their trouble. Five prizes, varying in value from one thousand to about one hundred dollars, were offered, of which the first was awarded to Professor Schröter, of St. Petersburg; the second to Heinrich Seeling, of Berlin; the third to Carlo Sada, of Milan; the fourth to Axel Anderberg, of Stockholm, and the fifth to August Weber, of Moscow; while the jury recommended the purchase of a design from an architect in Rheims, France. It will be seen that the distribution of prizes was tolerably international; and, considering that only eighteen plans were submitted, the number of foreign countries represented was something extraordinary. Nine designs were received from Russia, seven being from St. Petersburg, one from Moscow, and one from Odessa; two from Berlin; one from Frankfort; one each from Paris, Rheims and Toulon; one from Stockholm, one from Lausanne, and one from Milan.

## STATICS OF STRUCTURES. — THEORETICAL AND APPLIED.[1] — IV.

### BEAMS VARIOUSLY LOADED AND SUPPORTED; TRANSVERSE SHEARS.

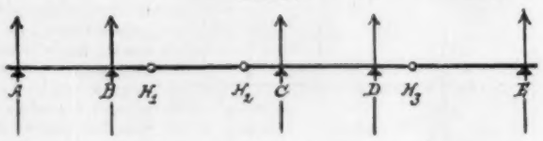


*Fig. 27.*

A BEAM, or truss, is said to be *statically determined* when its form and the number of its supports are such that its strains and reactions can be readily found by means of equations or diagrams based solely upon the assumption that the system of forces acting upon that beam, or truss, are in equilibrium. If this assumption is not sufficient, the beam, or truss, is said to be *statically undetermined*. The calculations for it will then involve the application of differential and integral calculus, the theory of elasticity, influence of temperature, etc. An example of a statically undetermined beam is the continuous girder, or beam with more than two supports. Such a girder with, say, $n$ supports can, however, be made statically determined by fitting it with $n-2$ hinges, so arranged that not more than two will occur between any two adjacent points of support and that alternating parts of the girder will be hingeless, as indicated in Figure 27. This *continuous hinged, cantilever, or Gerber's girder*, as it is called in honor of its inventor, consists of the simple beams $A\ B\ H_1$ and $H_2\ C\ D\ H_3$, with projecting or overhanging ends, which carry the parts $H_1\ H_2$ and $H_3\ E$ in suspense.

75. The part $H_1\ H_2$ can be readily calculated as a simple beam supported at $H_1$ and $H_2$, and its reactions at these points found accordingly. These reactions are then considered as loads in calculating the parts $A\ B\ H_1$ or $H_2\ C\ D\ H_3$.

Let us take the part $H_2\ C\ D\ H_3$ and assume it to carry a number of concentrated loads, as per Figure 28; $P_1$ and $P_5$ being the reactions due to the parts $H_1\ H_2$ and $H_3\ E$, assumed to have been previously determined. We draw the load-line $P_1 - P_5$, and after selecting a pole $O$, the rays 1, 2, 3, — 6 (Fig. 28*a*), and the cord-polygon 1′, 2′, 3′, — 6′, parallel to them (Fig. 28). The closing-line 7′ is drawn through the points $a$ and $b$, which are determined by prolonging the first and last sides 1′ and 6′ inwardly until they intersect the reactions. A parallel 7 to this closing-line in Figure 28*a* divides the load-line into the two reactions $C$ and $D$; $C$ being in equilibrium with the parallels of 7 and 1 at $a$, and $D$ with those of 7 and 6 at $b$ (§ 59).

76. The peculiarity of this diagram of moments (as the shaded figure formed by the polygon and closing-line may be called) consists in its partly lying above the closing-line, instead of entirely beneath it, as has heretofore been the case. Further, the sections of zero-moment no longer lie at the points of support, but have moved inward towards the centre of the span; while two additional sections of zero-moment occur at the ends.

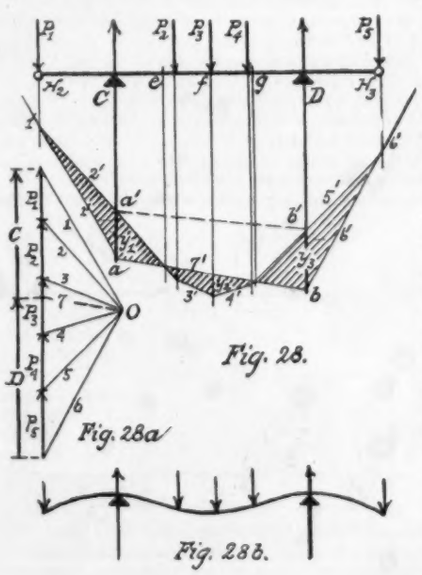


*Fig. 28.*

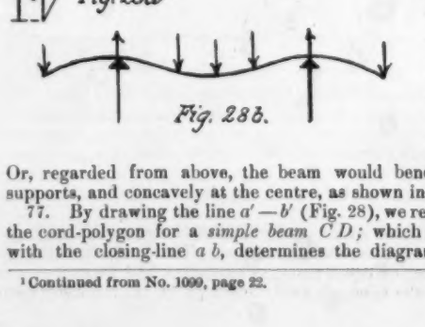

*Fig. 28a.*

*Fig. 28b.*

The bending-moments for all sections under which the diagram lies above the closing-line are negative; and where it lies beneath the closing-line, positive. That such is the case can readily be found by writing out the equations for several sections, after the manner illustrated in § 70. Reviewing the different sections, we have: for $H_2$: $M = o$; for $C$: $M = -H y_1$; for $e$: $M = o$; for $f$: $M = H y_2$; for $g$: $M = o$; for $D$: $M = -H y_3$; and for $H_3$: $M = o$. Or, regarded from above, the beam would bend convexly at the supports, and concavely at the centre, as shown in Figure 28*b*.

77. By drawing the line $a' - b'$ (Fig. 28), we recognize in $a'\ 3'\ 4'\ b'$ the cord-polygon for a *simple beam* $C\ D$; which polygon, together with the closing-line $a\ b$, determines the diagram of moments for that *part of the continuous girder* lying between $C$ and $D$. If, therefore, the moments for the supports $C$ and $D$, or their ordinates $y_1$ and $y_3$, and thereby the location of the closing-side, are given, the diagram for this part can be readily constructed from its simple cord-polygon. It is apparent that this method is of no advantage unless

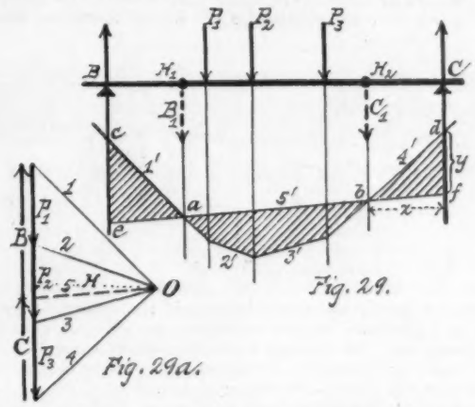


*Fig. 29.*



*Fig. 29a.*

the moments for the supports or their ordinates can be found beforehand in some simple manner. This can be accomplished independently of the part $C - D$, namely, by making use of the hinge-points in the adjacent spans.

Let us, therefore, examine the part $B\ C$, lying to the left of the part just considered. It carries the three loads $P_1$, $P_2$, $P_3$ (Fig. 29), for which we draw the load-line and cord-polygon in the customary manner. Before drawing the closing-line, however, let us stop to consider that the condition of equilibrium requires the moments at the hinge-points $H_1$ and $H_2$ to be equal to zero; for, otherwise, the girder would separate at these points. Since the closing-line intersects the cord polygon under all sections for which the bending-moments are equal to zero, the points $a$ and $b$ of our polygon, being vertically under the hinges, must also be points of the closing-line 5′, which is therefore to be drawn through them. A line drawn parallel to 5′ from the pole to the load-line (Fig. 29*a*) divides the latter into the *partial* reactions at $B$ and $C$. To these must be added the reactions from those parts of the girder lying to the left of $B$ and to the right of $C$, in order to get the entire reactions at these points. (The entire reaction for $C$ was previously found in Figure 28.)

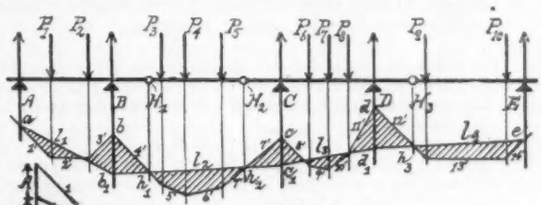

*Fig. 30.*

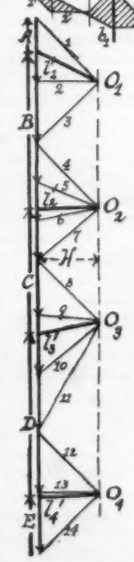

*Fig. 30a.*

78. The partial reactions $B$ and $C$, as found in Figure 29*a*, exist primarily at the points $H_1$ and $H_2$. Here they act as loads — directed downward — on the ends of the projecting parts $B\ H_1$ and $H_2\ C$, which parts may be considered as cantilevers, *i. e.*, beams supported at only one end.

Those parts of the diagram of moments in Figure 29 lying under $B\ H_1$ and $H_2\ C$ will serve as examples of cord-polygons for such beams. Their maximum bending-moment occurs at the point of support, and decreases as the free end is approached, at which it becomes zero.

That $-H y$ is actually the bending-moment for the point $C_1$, and therefore equal to $-C_1 x$, the moment of $C_1$ about $C$, is readily apparent from the similarity of the two triangles $b\ d\ f$ and $C - 5 - 4$, by virtue of which

$$x : H :: y : C, \text{ from which}$$
$$x\ C = H y, \text{ or, since } C = C_1,$$
$$x\ C_1 = H y.$$

79. If we now take part $D\ E$ of the girder, construct its simple cord-polygon and draw the closing-line through it under the points $E$ and $H_3$, we obtain the moment for the support $D$.

Thus can be found the moments for both $C$ and $D$ independently of the span $C\ D$. Knowing these, we could readily draw the closing-side across the simple cord-polygon for that part.

In this manner the complete diagram of moments for a continuous hinged girder of any length may be constructed by first drawing the simple cord-polygons under all parts, and then locating the closing-line by means of a sufficient number of hinge points. The moments for both ends, or end supports, of the girder always being zero, *two*

[1] Continued from No. 1099, page 22.

points of the closing line on the cord-polygons are thus given in advance, leaving, if there are $n$ supports, $n-2$ points still to be determined. For this reason a girder with $n$ supports requires $n-2$ hinges, since each hinge determines a point.

80. Figure 30 shows the complete diagram for the entire girder. First, the simple cord-polygons for the several spans are drawn in

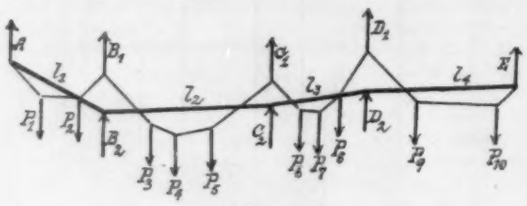

*Fig. 30b.*

succession, using the same pole-distance $H$ throughout. Care must be taken to join each polygon to the one preceding it, as at $b$, $c$, $d$. The closing-side $l_2$ for the span $B\,C$ is then drawn through $h_1$ and $h_2$, giving $b_1$ and $c_1$; similarly $l_4$ through $e$ and $h_2$, giving $d_1$; and finally $l_1$ through $a$ and $b_1$, and $l_3$ through $c_1$ and $d_1$.

The reactions are determined by drawing $l'_1$, $l'_2$, $l'_3$, $l'_4$ from the several poles to the load-line (Fig. 30*a*), parallel to the closing sides $l_1$, $l_2$, $l_3$, $l_4$, respectively. The reactions for the end supports are those parts of the load-line coming between the first ray and $l'_1$, and the last ray and $l'_2$, namely, $A$ and $E$. The reaction for any intermediate support is that part of the load-line intercepted between the two parallels corresponding to the closing-sides of the spans to the right and left of the support in question.

To prove this, let us consider the entire figure formed by all the polygons and closing-lines as an equilibrium-polygon (§ 56), with the loads $P_1$, $P_2$, $P_3$, $-P_{10}$, and the vertical upward forces $A$, $B_1$, $B_2$, $C_1$, $C_2$, $D_1$, $D_2$, $E$ acting at its angles (Fig. 30*b*). If we proportion these latter upward forces so that all angles of the polygon will be in equilibrium, then the force $A$ will equal the reaction at $A$; the forces $B_1+B_2$, the reaction at $B$; $C_1+C_2$, that at $C$; $D_1+D_2$, that at $D$; and $E$, that at $E$. $A$, being in equilibrium with 1′ and $l_1$, is therefore equal to the length intercepted on the load-line by 1 and $l'_1$; $B_1$, being in equilibrium with the sides 3′ and 4′, is equal to $B'_1$ in Figure 30*c*; similarly $B_2$, in equilibrium with $l_1$ and $l_2$, equals $B'_2$ in the same figure. Together $B'_1$ and $B'_2 = B$, the reaction, because parallels between parallels are equal. Further, $B$ is evidently that part of the load-line lying between $l'_1$ and $l'_2$. In a similar manner, $C$, intercepted between $l'_2$ and $l'_3$, can be proved equal to $C_1+C_2$; and so on.

81. The bending-moment for any section of the girder is again equal to the pole-distance $H$ multiplied by the ordinate $y$ of the diagram of that section; if $y$ lies beneath the closing-line, it is positive; if above, negative.

82. In speaking of the overhanging parts $B\,H_1$ and $H_2\,C$, in § 78, we had occasion to refer briefly to cantilevers, or beams supported at only one end. Since these play quite an important part in practical work, it will be well to investigate them somewhat more fully before leaving the subject.

Figure 31 shows a type often met with: a beam built into the

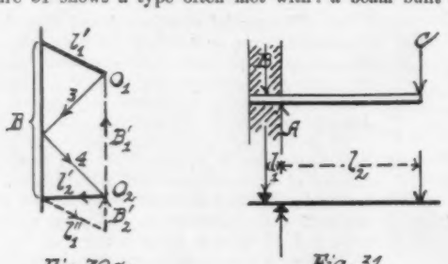

*Fig. 30c.* *Fig. 31.*

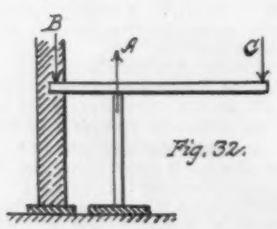

*Fig. 32.*

wall at one end and loaded at the other. The beam resting on the fulcrum $A$, an upward pressure is exerted by the left-hand part, which is counteracted by the *downward* reaction $B$ of the wall. In order that equilibrium may exist, the moments of $B$ and $C$ about $A$ must be equal and opposite to each other, that is, $C l_2 + (-B l_1) = 0$. Accordingly, a cantilever is to be more properly considered as a beam with two supports, one exerting an upward reaction, as at $A$, and the other a downward, as at $B$.

83. By regarding the downward reaction $B$ as a load, we find the reaction $A$ equal to $B+C$. In cases similar to Figure 31, however, the projecting part $l_2$ only is taken into account, and its reaction at $A$ said to be equal to the load carried, or $C$; while the reaction due to $B$ is disregarded. This is permissible because that part of the reaction, being the weight of the upper portion of wall, although it makes its appearance at the point $A$, is soon spread over the entire cross-sectional area of the wall again; and when the footings are reached, the total load on them is equal to the weight of the wall plus the load $C$, so that the reaction $B$ has seemingly disappeared. Of course, it must be ascertained whether the masonry at the point $A$ can safely resist the compressive strain placed upon it, that being equal to the sum of the load $C$ and the reaction $B$.

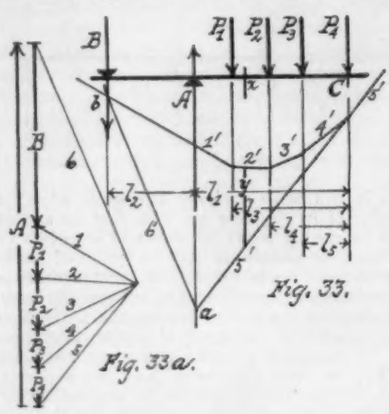

*Fig. 33.*

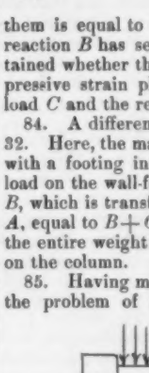

*Fig. 33a.*

84. A different result is obtained in the case illustrated by Figure 32. Here, the main support of the cantilever is formed by a column with a footing independent of that of the wall. Accordingly, the load on the wall-footing is diminished to the extent of the reaction $B$, which is transferred to the column-footing, the load on that being $A$, equal to $B+C$. In other words, if $C$ were made large enough, the entire weight of the upper portion of the wall could be thrown on the column.

85. Having mastered these fundamental principles, let us solve the problem of finding the upward and downward reactions and

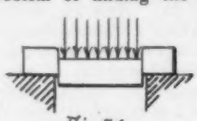

*Fig. 34.*

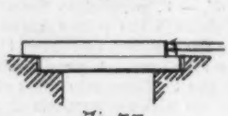

*Fig. 35.*

bending-moments of a cantilever with the concentrated loads $P_1-P_4$, supported at the points $A$ and $B$, Figure 33.

We draw the load-line $P_1-P_4$, Figure 33*a*, and after selecting a pole $O$, the rays 1, 2, —5, and the cord-polygon 1′, 2′, —5′ parallel to them as heretofore. The side 1′ we draw long enough to intersect the reaction $B$ at $b$. Now, since the reaction $A$ is the resultant of the entire system, the two outer sides of its cord-polygon must intersect on that line (§ 57). We know, so far, one of the outer sides, namely, 5′, and a point $b$ of the other on the line of the reaction $B$. By prolonging 5′ until it intersects with $A$ at $a$, we can therefore draw the other outer side, 6′, through these points $b$ and $a$. Drawing a ray 6 parallel to this side 6′ from the pole to the load-line prolonged, gives us $B$ between 6 and 1, with the parallels of which it is in equilibrium at $b$. $A$, of course, is equal to the total load-line, being in equilibrium with the outer sides 5′ and 6′.

86. The bending-moment for any section $x$ is again equal to the ordinate $y$ under that section, times the pole-distance $H$. It is a maximum at the point of support, and a minimum at the free end. It is apparent that that part of the beam to the left of $A$ could be disregarded in drawing the cord-polygon, and the bending-moments still correctly found for any section to the right of $A$. The case would then be a direct application of Equation 12 as defined in § 63.

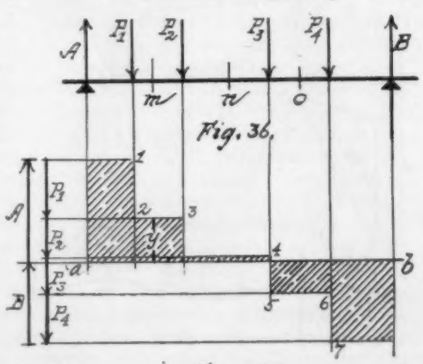

*Fig. 36.*

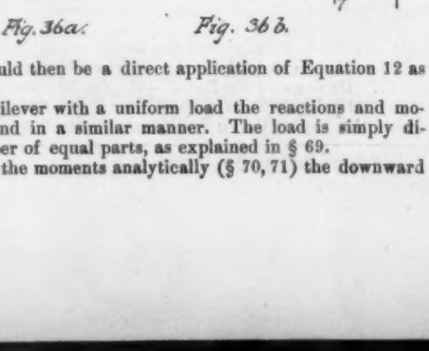

*Fig. 36a.* *Fig. 36b.*

87. For a cantilever with a uniform load the reactions and moments may be found in a similar manner. The load is simply divided into a number of equal parts, as explained in § 69.

88. In finding the moments analytically (§ 70, 71) the downward

reaction $B$ must always be taken into account, because without that the condition of equilibrium will not be fulfilled. Thus the moment about $C$, Figure 33, is

$$M_C = A\,l_1 - B\,(l_2 + l_1) - P_1 l_2 - P_2 l_4 - P_3 l_5,$$

which equals zero; and not

$$A\,l_1 - P_1 l_2 - P_2 l_4 - P_3 l_5,$$

which would by no means equal zero.

89. Up to the present we have been content to investigate only one of the effects of loading a beam, namely, that of cross-bending, as measured by the bending-moment.

A second effect is that of *transverse shearing*.

In cross-bending, as we have seen, the fibres of the beam are subjected partly to compressive, and partly to tensile strains; those above the neutral axis being crushed together, and those below it being torn apart. In shearing, the resistance of the material is overcome by sliding the fibres past one another, along a plane; either across the grain (Fig. 34), or parallel with it (Fig. 35). The first is known as *transverse*, the second as *longitudinal* shear.

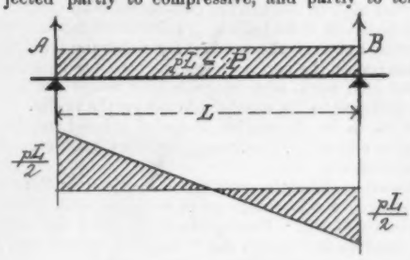

*Fig. 37.*

90. Assuming the upward direction positive, and the downward negative, the transverse shear at any section $n$ between the loads $P_2$ and $P_2$ of a beam $A\,B$ carrying the concentrated loads $P_1 - P_4$, Figure 36, is

$$S_n = A - P_1 - P_2.$$

It is the force which would attempt to push the left-hand part of the beam upward and away from the right-hand part, if the latter were held firmly in place. The amount of $S_n$ can readily be found on the load-line as the difference between $A$ and $P_1 + P_2$.

Similarly, the transverse shear for any section $m$ between $P_1$ and $P_2$ is

$$S_n = A - P_1;$$

and for any section $o$ between $P_2$ and $P_4$

$$S_o = A - P_1 - P_2 - P_3.$$

91. These various transverse shears can be determined very conveniently by means of a shear diagram (Fig. 36*b*). This is constructed by drawing horizontals out from the load-line across the vertical prolongations of the several loads. Wherever a horizontal drawn out from the ends of a load intersects its corresponding vertical, a point of the diagram is located, as at 1, 2, 3,— 7. A main axis $a - b$ is drawn out from the point which divides the load-line into the two reactions. (The reactions must be previously found by means of the cord-polygon.) All parts of the diagram lying above this line represent positive, or upward shear; all lying beneath it, negative or downward shear. The shear for any section can now be found by measuring under it the ordinate $y$ of the diagram with the pound-scale (as indicated at $m$).

92. It will be noticed that the transverse shear, contrary to the bending-moment, is greatest at the supports, and smallest near the centre of the span.

Figure 37 shows the transverse shear diagram for a beam uniformly loaded with $p$ pounds per foot. Here the shear at the centre is equal to zero, being $A - \frac{pL}{2}$.

93. Figure 38 gives the diagram for a cantilever with concentrated loads. At the section $x$ —regarding the right-hand part— the shear is equal to $P_3$; at $y$, $P_3 + P_2$; at $z$, $P_3 + P_2 + P_1$, or $A$; so that it is greatest at and near the point of support.

For a cantilever with a uniform load we get a triangular diagram, as shown in Figure 39.

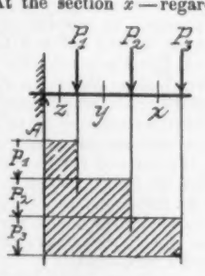

*Fig. 38.*

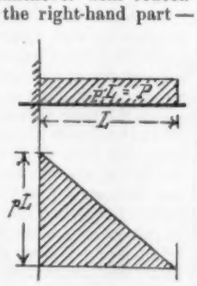

*Fig. 39.*

94. Compared with cross-bending, transverse shearing is of only secondary importance in determining the cross-section of beams. In other words, a beam capable of safely resisting its maximum bending-moment, will almost always be likewise strong enough to resist its maximum shear, which may therefore be ignored. Very short, thin and deep beams sometimes form exceptions; likewise built-up girders.

In calculating connections, however, transverse shearing plays a very important part. Thus, the number and size of the rivets or bolts required to frame one beam into another are dependent almost entirely upon the shear existing at its ends.

95. The resistance of a beam, bolt or rivet, against transverse shearing is equal to its cross-sectional area multiplied by the safe resistance per unit area of the material against shearing. Of this we shall, however, speak more fully in the next chapter, in connection with the practical application of the foregoing theories.

O. F. Semsch.

[To be continued.]

## BOOKS AND PAPERS.

In the very heart of North Germany, fifty or sixty miles from Berlin, is the old town of Zerbst. This was once the capital of the principality of Anhalt-Zerbst, and a rich and flourishing community, but the line of Princes of Anhalt-Zerbst became extinct a hundred years ago, and their ancient town has since remained substantially as they left it. One of the chief ornaments of the little city was, and still is, the Council-House,[1] built in what was, considering the importance of the town, a style of great magnificence, in the latter half of the fifteenth century, and added to in 1610. The citizens of Zerbst in the fifteenth century were a thrifty set, and rented the basement of their building for various purposes, under leases which are still in existence. The town "apotheker" had his place there, and, naturally, a considerable commerce in beer was carried on by the principal tenant, whose lease, however, dated in 1479, provided that "An allen Sundagen schal he den Kelre nicht openen," or "biergeste darein setten," until the close of high mass in the town church. Some of the columns in the cellar of the Council-House were taken from this same church, which dated from about 1107, but was torn down and rebuilt in 1446–94, just at the time of the construction of the Council-House; but the latter is, in general, pure fifteenth-century North German Gothic, and the gables, which are contemporary with the rest, are among the finest of their kind in existence. These, as well as the plans of the building, the main fronts, the interior, and various details, are admirably illustrated in fourteen large plates, reproduced from measured and rendered drawings, the whole forming a model monograph of a building of peculiar interest.

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Mr. F. C. Moore, President of the Continental Fire Insurance Company, has long been known for his interest in the science of construction, to which he has himself made valuable additions from his experience in fire-insurance matters, and it is with much pleasure that we find him venturing into a wider field, that of suggestions for building in general, and, particularly, building as applied to dwelling-houses.[2] A householder of observant mind, who has been engaged for many years in matters connected with building, and has studied not only building, but sanitation and domestic economy, in theory as well as in practice, ought to be qualified to write a tolerably useful book on such subjects, but Mr. Moore has not only these qualifications, and special ones besides, but has been modest enough to submit his work to architects and builders for criticism, and has given his readers that benefit of their wisdom in addition to his own. Primarily, the book is intended for family men who think of building, and the suggestions that it contains incline rather to the arrangement of closets, the best form of lock for the kitchen door, and precautions against mice, than to details of construction and planning, which the author thinks should be left to a competent architect; but observations of this sort, which are very much such as an architect accumulates in the course of his discussions with intelligent clients, are extremely useful to a professional man, particularly to a young one, who is not himself a householder; and the book contains, in addition, a good summary of framed construction, a specification and contract.

It would hardly be likely to occur that, out of so many suggestions, some should not be open to criticism, and we imagine that architects will question Mr. Moore's opinion that a twelve-inch brick wall would make a good foundation for a house in clayey soil in the Northern States, and will think that upper flooring, instead of being "kiln-dried or time-seasoned," ought to have both those qualifications at once; and the author's provision for making a mouse-proof store-closet by laying galvanized wire-netting in the plastering, and between the floors, seems to lose sight of the fact that a door will be needed for the store-closet, and that a mouse can easily crawl under a door as ordinarily fitted, while a rat can do the same after a few minutes work with his teeth; but these are trifling matters. A more serious one is the diagram to show the construction of a fireplace, on page 96, which is about as well calculated as it could be to insure smoking in windy weather, and the speedy dislocation of the hearth; while the same diagram gives a curious idea of the proper framing of tail-beams into headers. However, the architect, whom Mr. Moore advises all owners to employ, would soon set such matters, which come more particularly in his province, in proper shape, and they need not prevent either architect or owner from being grateful to the author for a little book which will be useful to both of them.

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[1] "*Das Rathaus zu Zerbst*"; Ein Beitrag zur Kunstgeschichte des Herzogtums Anhalt; herausgegeben von Robert Schmidt, Geprüften Architekt und Bauschuldirektor. Zerbst, Friedrich Gast's Hofbuchhandlung.

[2] "*How to Build a Home*"; Being Suggestions as to Safety from Fire, Safety to Health, Comfort, Convenience, Durability and Economy: By Francis C. Moore, President of the Continental Fire Insurance Co., New York. 1897.

# ILLUSTRATIONS

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

THE PORTE COCHÈRE: HOUSE OF ELDRIDGE T. GERRY, ESQ., EAST 61ST ST. AND FIFTH AVE., NEW YORK, N. Y. R. M. HUNT, ARCHITECT.

[Gelatine Print, issued with the International and Imperial Editions only.]

General views of this house have been published in our issues for Aug. 25, 1894 and June 1, 1895.

NEW CITY PRISON, NEW YORK, N. Y. MESSRS. WITHERS & DICKSON, ARCHITECTS, NEW YORK, N. Y.

The plan contemplates the erection of a building, 186′ x 45′, running parallel to and facing on Centre Street, setting back 8 feet from the line of the street, with a wing in the rear for the kitchen, chapels, etc. The entrance to the prison will be on Centre Street, which will open into a hallway the depth of the building, and which serves the public for a waiting-room and offices for the warden.

An office for the doctor is provided on this floor, as well as separate lavatories for men and women.

After passing through the gates guarded by keepers at the end of the hall, there will be found a room for searching women before they are permitted to visit the prisoners, and another room of the same size in which prisoners can take counsel with their lawyers.

A doorway at the end of the hall will lead to a lobby, in which will be placed a staircase and an elevator for communication with the floors above, as well as provide exits, on one side for women to their quarters, on the other for prisoners on their way to the Criminal Courts, and in the rear through a corridor 8 feet wide to the men's and boys' prisons.

Ascending to the floor above, and passing through a guard-room for the keeper in charge, will be found the entrance to the first floor of the prison, which is planned to accommodate 160 prisoners in cells arranged in four tiers. The second floor of prison will be an exact counterpart of the first floor.

The cells are arranged in the middle of the building, having a passageway of 9½ feet wide between them and the outer walls of prison, and an enclosed space 5 feet wide in their rear, which is designed for the reception of the heating, ventilating and plumbing pipes, so that they can be easily examined and also be out of the reach of the prisoners.

Each cell will be 8′ x 6′ and 8½′ high, and will be furnished with a water-closet of the best and most improved type and a wash-bowl; and will be thoroughly ventilated. At the ends of the cells on each tier there will be located a small room or closet for brooms, pails, etc., as well as a sink, and another room in which will be placed a rain-bath and a bath-tub for the use of the prisoners in that tier. The cells will be constructed of steel throughout and fitted with sliding grille doors.

The windows of both stories of prison will be divided into four heights, in each of which there will be two sashes, and all so hung that the whole eight can be operated simultaneously, thereby affording thorough outside ventilation in every part.

On the topmost floor of the prison, it is proposed to arrange a couple of airing-courts for the benefit of prisoners requiring exercise. These courts will be open on all sides, and from their being 90 feet above the street-level and every opening filled with an iron guard, there will be no possibility, either of escape, or of communication with the outer world.

The building in the rear will contain on the ground floor, a dining-room for the use of the keepers, with kitchen above.

On the second and third floors over, are two small rooms, for prisoners of both sexes of the better class, who are sometimes thrust into prison on mere suspicion, or who from private malice are detained in it for a short time, and in connection with these rooms (those for men being on one floor, and those for women on the floor above) has been arranged an infirmary or hospital, with space for two or three beds in each, for the sick. In all these rooms the prisoners would be thoroughly secure, and from their being located in the yard, they would have no chance of communicating with any one outside the prison.

On the level of the floor for women, a library has been provided for the books (which now number some 2,500 volumes) for the use of the prisoners.

On the fourth and fifth floors of this wing space has been set apart for two chapels, the lower one for the Roman Catholics and the upper one for the Protestants.

The fifth floor of this wing, at the height of about 70 feet from level of the street, will be occupied as a kitchen.

On the floor below the kitchen is a restaurant, for those prisoners who are willing to pay extra for their food.

It is proposed to erect an addition of two stories to the present women's prison building, with a new dining-room on the ground floor. In the floor above there will be two bed-rooms for the matrons, and also a small dormitory for two or three girls, whom it might be well to keep apart from the rougher class of prisoners. Separate baths and water-closets are provided for both the matrons and the girl prisoners.

Large dormitories are provided for the workhouse men and women on the ground floor of prison building, one at either end, that for the women in close proximity to the women's quarters, and that for the men in the rear of men's prison. Each of these dormitories will have a lavatory, water-closets and rain-bath. In the rear of men's prison adjoining the dormitory for men, provision has been made for two padded cells, for the temporary confinement of insane prisoners.

In the cellars will be located the engines, dynamos, boilers, etc.; and a chimney 125 feet high in the yard in connection with them.

The buildings are designed to be built of granite throughout.

The design is intended to show the purpose for which the building is erected and for this reason the two stories of the prison are marked by strong lines of moulded work, with long windows subdivided into four openings corresponding to the number of cells on the inside.

The construction is to be thoroughly fireproof throughout, the walls being of granite and brick, the floors, partitions, roof, etc., of iron, and the roofs slated, etc.

The present plan contemplates the erection of a prison on Centre St., with accommodation for 320 prisoners in separate cells (more than double the capacity of the "Tombs," in which there are only 135). When this building is erected, the "Tombs" will be taken down and additions made to the men's and women's prisons, which will have accommodation for 208 more prisoners; added to this, both of these buildings could be raised, if so desired, giving extra cells to the number of 48 for men, and 42 for women.

The total cellular accommodation would then be as follows:

| | | Cells. |
|---|---|---|
| In New Prison now to be erected, | | 320 |
| In present Women's Prison, | 68 | |
| If raised three tiers, | 42 | 110 |
| Extension of Ditto, | | 96 |
| In present Men's Prison, | 80 | |
| If raised three tiers, | 48 | 128 |
| Extension of Ditto, | | 112 |
| | Total, | 766 |

It is estimated that the cost of the new prison now proposed to be erected will be $720,000.

PLANS OF THE SAME.

DETAIL OF ENTRANCE TO THE CONVENT OF SANTO ESPIRITU, SALAMANCA, SPAIN. ALONZO BERRUGUETE, ARCHITECT.

TOMB OF CARDINAL JACOPO IN SAN MINIATO AL MONTE, NEAR FLORENCE, ITALY. ANTONIO ROSSELLINO, ARCHITECT.

HOUSE FOR OLIVER PRESCOTT, ESQ., DARTMOUTH, MASS. MR. W. G. RANTOUL, ARCHITECT, BOSTON, MASS.

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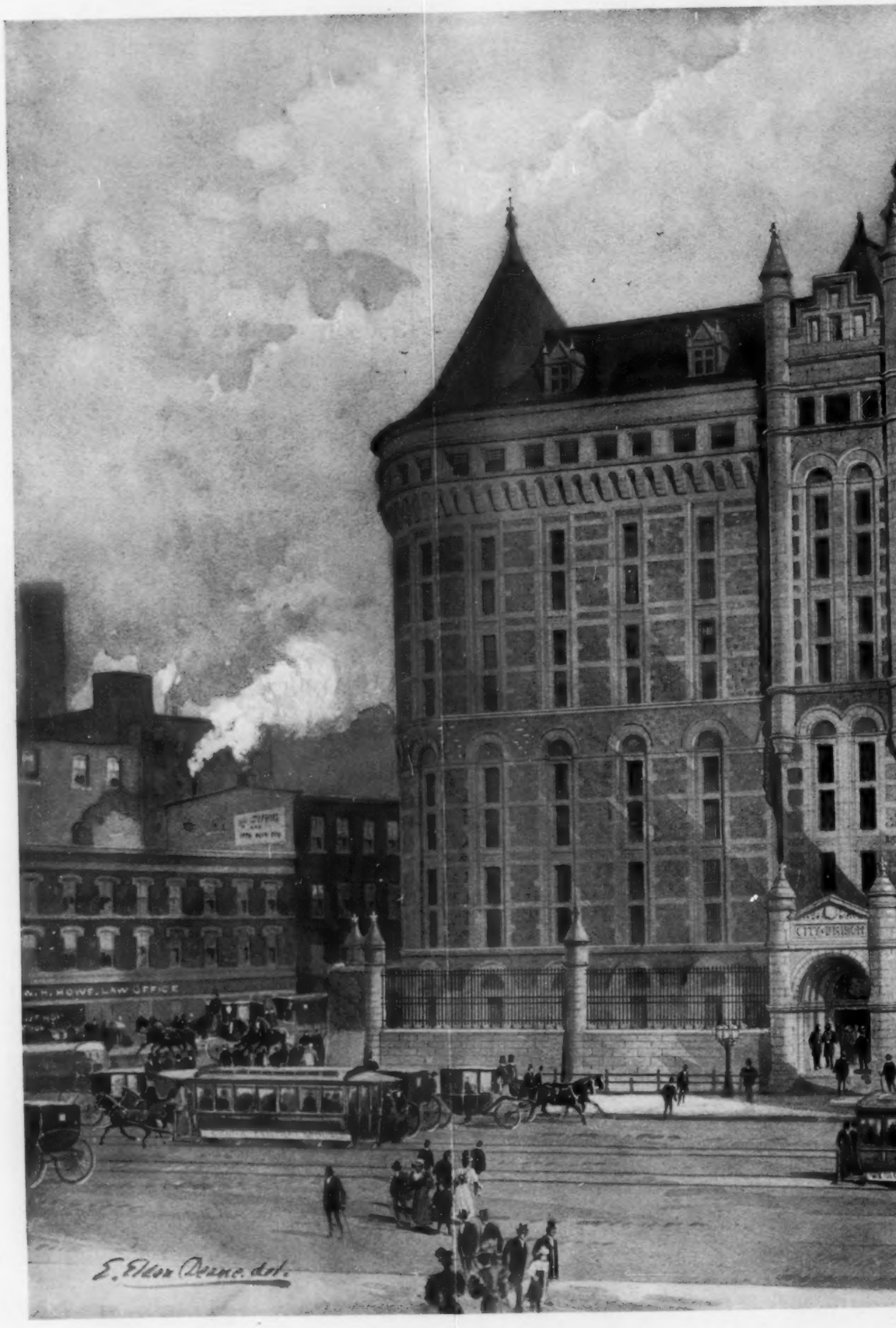
**[The following named illustrations may be found by reference to our advertising pages.]**

MONUMENTAL FOUNTAIN FOR STETTIN, PRUSSIA. HERR LUDWIG MANZEL, SCULPTOR, BERLIN, PRUSSIA.

It is not often that the decision of a jury in an artistic contest meets with such undivided approval, as was the case in the competition for a monumental fountain for the old and famous Hanseatic seaport town and capital of Pomerania, Stettin, when the jury awarded first honors to Herr Ludwig Manzel, a Berlin sculptor, to whom the task of executing the model was subsequently entrusted. It was held that his model was characterized by originality of invention not less, than by true monumental grandeur of expression. What the sketch promised, the colossal model, which was shown at last summer's Art Exhibition at Berlin, and which gained for its author the Grand Gold Medal, has abundantly fulfilled. Hammered in copper, at double the size of the large model, the beautiful group, when erected upon its final site in the centre of an appropriate basin, will undoubtedly afford a rare sight.

The composition is an allegory, intended to do honor to the Pomeranian capital as queen of the Baltic seaports. A mass of rock, which, after completion, will be partly submerged, serves as a base for the ship traversing the waves. To the right (not visible on our plate) is seen the sinewy figure of a man, planting his foot firmly against the rock and pulling the vessel with powerful effort, showing every muscle in his body. He represents "Human Agency" as contrasted with the gentle, but irresistible, "Agency of the Watery Element," leading the vessel out to sea, impersonated by the nude female figure to the left, resting her hand gently on the vessel's gunwale, while the dolphin, seen underneath the ship and suggesting the high seas, appears to preserve the balance of the masses. At the stern, another beautiful girlish form, having, from the hips

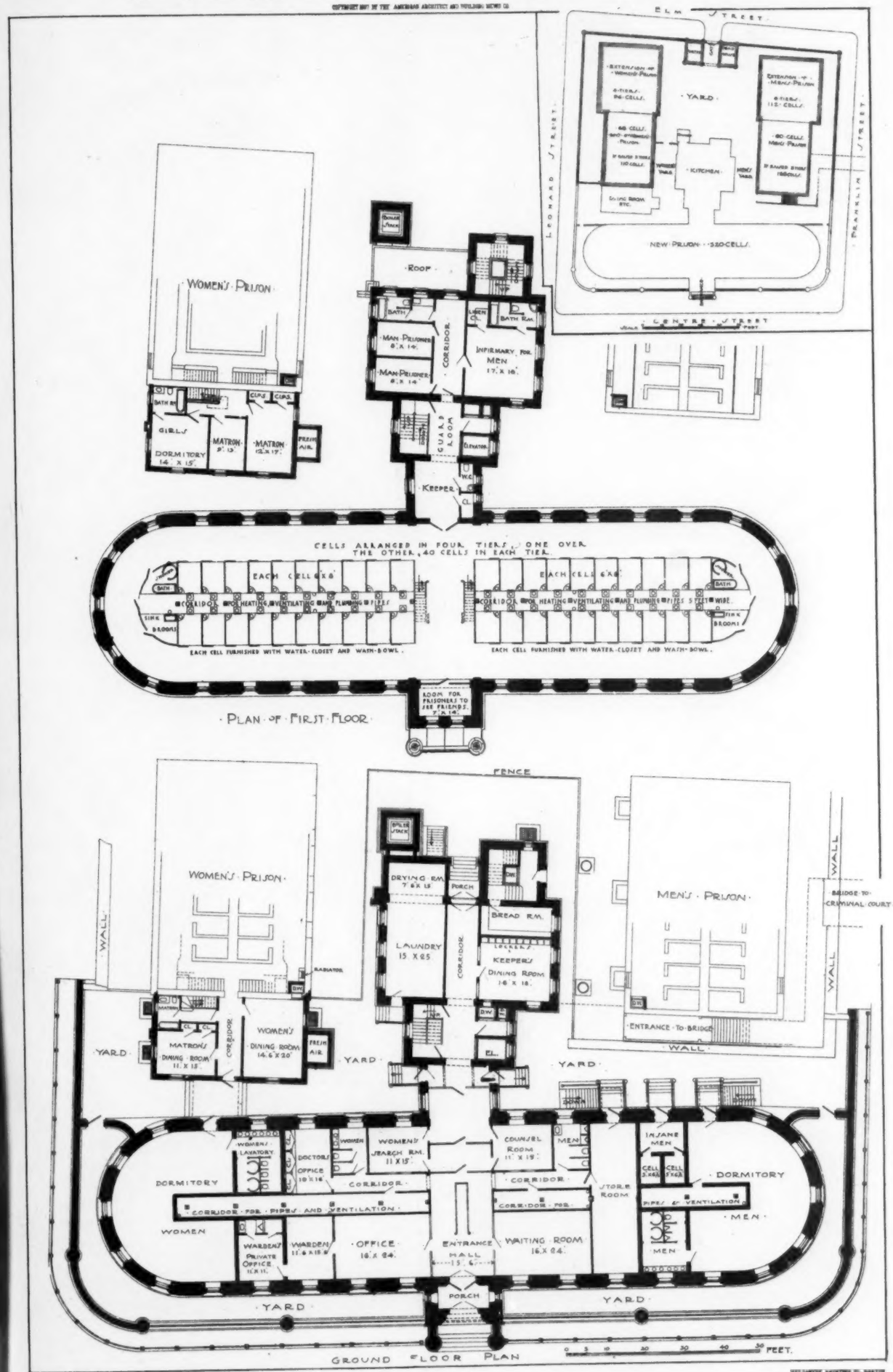



City

WITHER

CITY PRISON, NEW YORK.

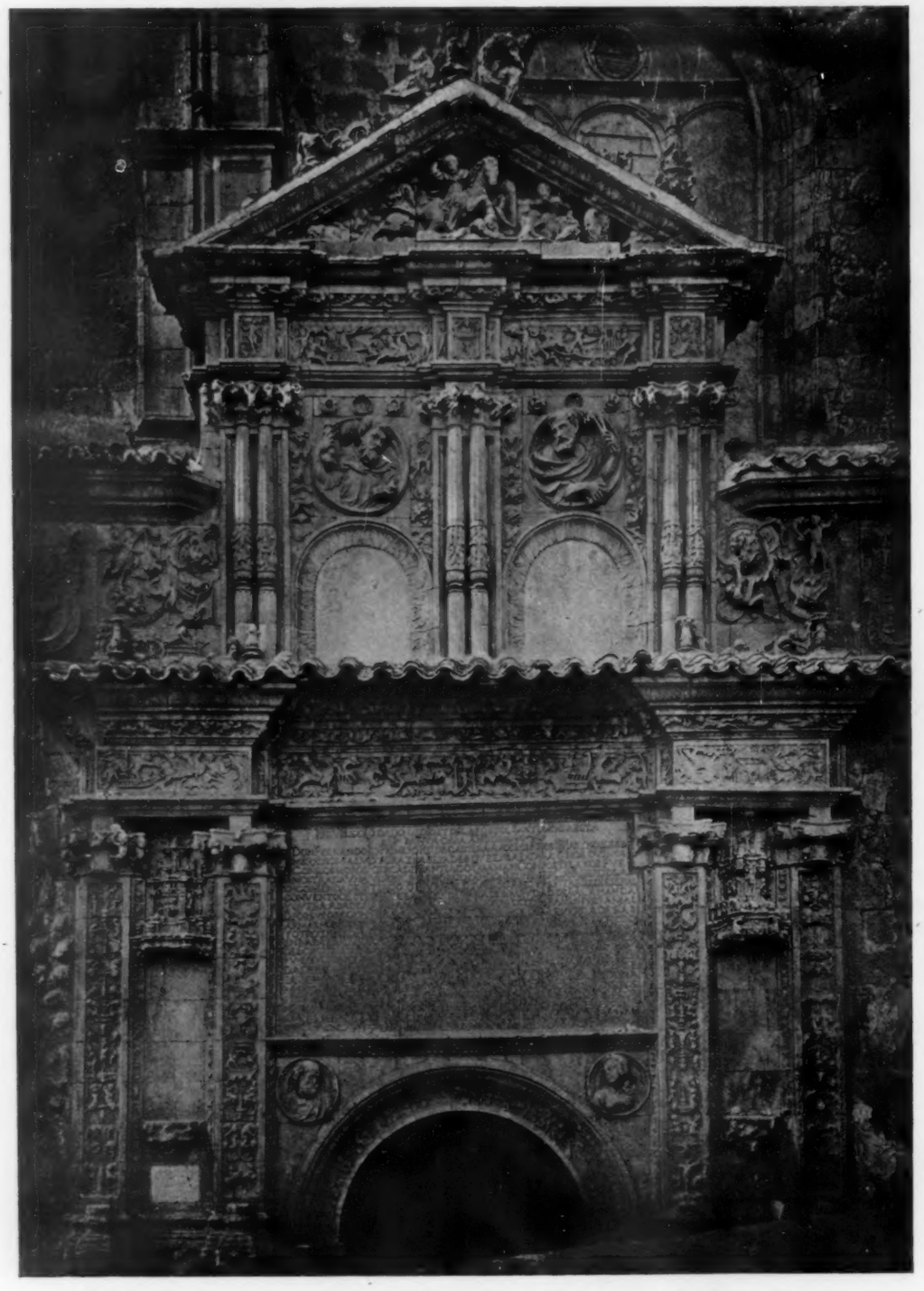
ITHERS & DICKSON, ARCHITECTS.




## NEW YORK CITY PRISON

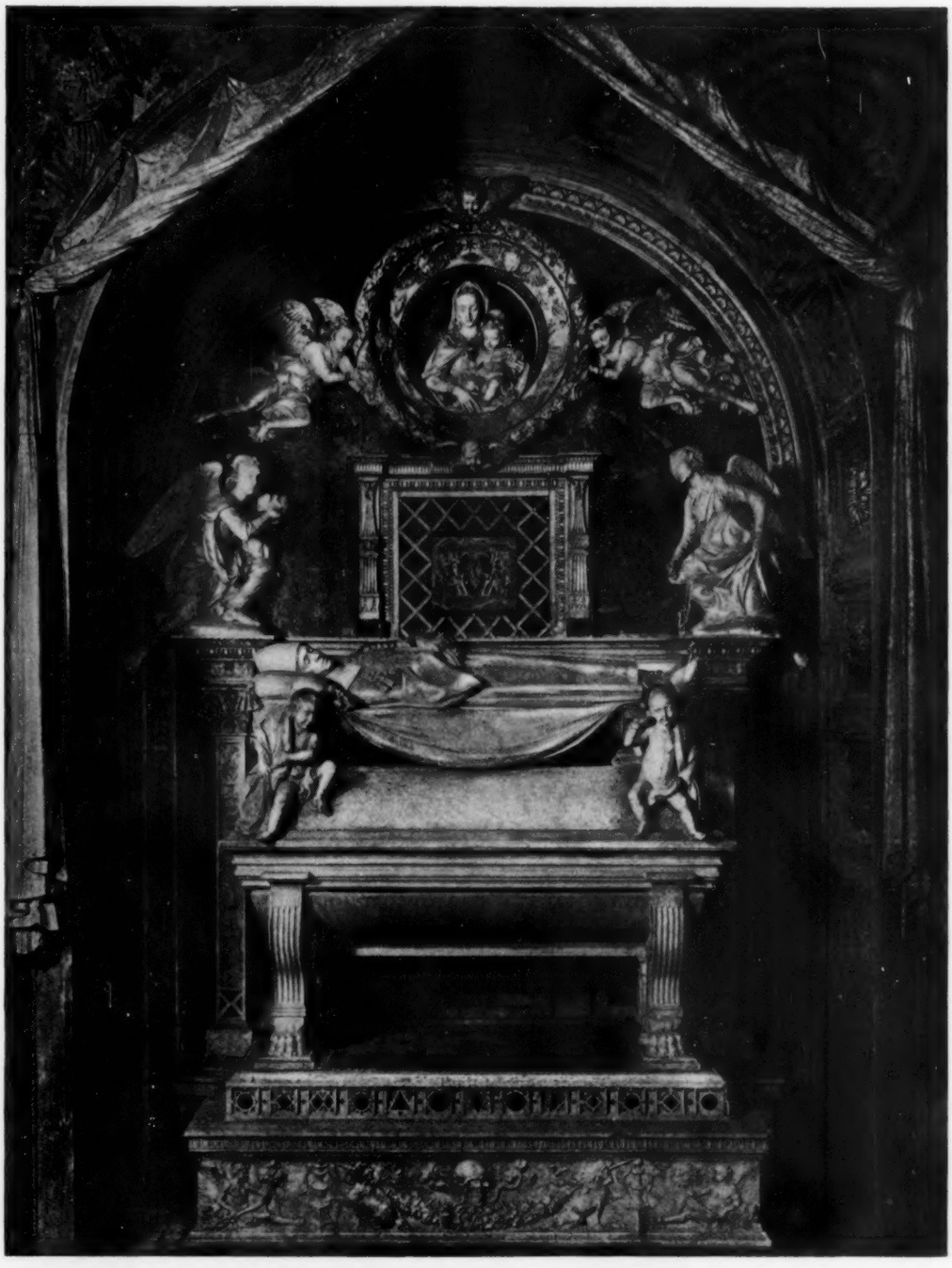
WITHERS & DICKSON ARCHITECTS

NEW YORK

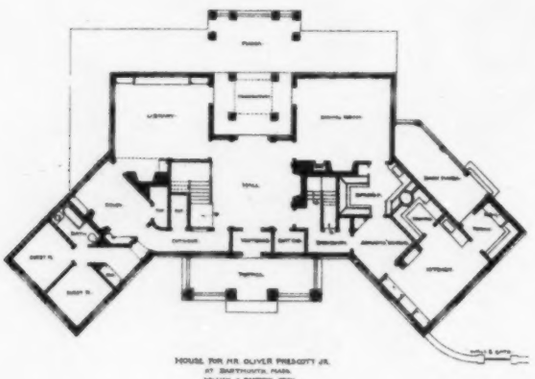


Detail of Entrance to the Convent of Santo Espiritu, Salamanca, Spain.

Alonzo Berruguete, Architect.



Tomb of Cardinal Jacopo in San Miniato al Monte, near Florence.
Antonio Rossellino, architect.



HOUSE FOR MR. OLIVER PRESCOTT JR.
AT DARTMOUTH, MASS.
WILLIAM G. RANTOUL, ARCH.
BOSTON

W. G. Rantoul.

HELIOTYPE PRINTING CO., BOSTON

down, the tail of a fish, rises from the water in graceful motion, holding the helm with one arm, and reaching out after the hanging fishing-nets with the other. Seaweed and aquatic plants wind around her hips. The ship, surrounded by these figures, is decorated with emblems and escutcheons suggesting old Norse wood-carving. The bow, extending far out, has the Pomeranian Griffin for a figure-head. At the vessel's bow we observe the half-sitting, half-leaning figure of youthful "Mercury," keenly scanning the horizon, representing "Commerce seeking new roads." High above him, occupying the centre of the group, in plain attire, yet looking the proud and forceful mistress, stands "Stettina," seizing with her left hand the ship's yard and sail, which rest on her shoulder, her right hand firmly placed upon the anchor, while the uplifted head is directed, with steady gaze, into the distance.

Herr Ludwig Manzel, the sculptor of this work, was born June 3, 1858, at Kagendorf, in Pomerania. He received his art education in Berlin, and afterwards worked for three years in Paris. In 1886, he attracted attention by his statue called "Am Wege," representing a blind flower-girl, sitting at the roadside. Later, in 1890, he produced a group which was purchased by the Prussian Government, representing "Peace protected by Arms," and showing an unusual degree of freedom in his conception of nature. In 1895, Herr Manzel exhibited at the Berlin Exhibition the graceful figure of a young girl reaper, walking and singing in a dreamy mood. This figure, called "Abendlied," made a deep impression by the tenderness of its lyric sentiment, while a number of other works of a more decorative character show the artist to be the possessor of a refined and truly cultivated taste.

ACCESSORIES OF LANDSCAPE ARCHITECTURE, NO. I: THE GRAND CASCADE, VILLA ALDOBRANDINI, FRASCATI, ITALY.

MEMORIAL TOMB TO SIR HENRY OGLANDER: BRADING CHURCH, ISLE OF WIGHT. MR. J. C. POWELL, ARCHITECT; MR. H. A. PEGRAM, SCULPTOR.

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**[Additional Illustrations in the International Edition.]**

THE CABILDO, NEW ORLEANS, LA.

[Gelatine Print.]

THIS building, long the seat of government, and lately used as a jail and court-house, was built by the Spaniards, at an early date, of imported brick covered with stucco. During the second period of French domination the mansard roof and cupola were added. The similar structure on the opposite side of the cathedral was also built by the Spaniards, but at a later date than the Cabildo.

RESTORATION OF THE CHÂTEAU DE MONTAL, LOT, FRANCE. MM. BOUTRON & SCHOELKOPT, ARCHITECTS: TWO PLATES.

[Copper-plate Photogravures.]

THE CHOIR: WINCHESTER CATHEDRAL, ENG.

SHAKESPEARE THEATRE, LAVENDER HILL, LONDON, ENG. MR. W. G. R. SPRAGUE, ARCHITECT.

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## SOCIETIES

SOCIETY OF BEAUX-ARTS ARCHITECTS. — REPORT OF THE COMMITTEE ON COMPETITIONS.

*Gentlemen,* — Your Committee on Competitions in reporting to the Society, after several meetings, in which the subject was thoroughly discussed by them, recommends that — in view of the difficulty of establishing any hard and fast line of conduct, binding alike on all its members, whether younger or older, more or less busy, or even more or less confident of success in a given competition — rules be adopted by the Society, partaking rather of the nature of recommendations to its members, such rules to embody a brief statement of what the Society endorses as the best practice to be followed, together with certain points which the Society as a body deems essential safeguards, to be observed in every properly conducted competition.

The "*Recommendations*" proposed by your Committee to read about as follows:

The Society of Beaux-Arts Architects, having the interest of the community at heart, as well as the advancement of the architectural profession, lays before its members the following recommendations as to their individual conduct in their relations to competitions, believing such recommendations to embody the best and most advanced ideas on the subject held by the profession not only in this country, but also abroad.

1. Members of this Society should do all in their power to discourage competition for private, business, or corporate buildings, and should endeavor to have all such work awarded outright, without other competition than, possibly, by the submission of preliminary sketches.

2. Other conditions being fair, the only basis of compensation for the above, or for any form of limited competition, is the Schedule of the American Institute for Preliminary Sketches, every or any architect whose designs are submitted or considered to receive the same compensation.

3. Competition for public buildings, or for semi-public buildings, such as *important* churches, hospitals, libraries, or colleges, etc., can only be entered, with the approval of this Society, if safeguarded by conditions which the Society deems essential to their fairness and success and to the self-respect of the participants.

4. The following are the conditions deemed *essential* to the fair and orderly conduct of a competition:

A. That a professional adviser shall be appointed by the party instituting the competition, whose duty it shall be to assist in the preparation of the programme, to assume all the direct relations with intending competitors, receiving and answering all communications, and giving all information in writing to all intending competitors alike; to examine all drawings or other matter called for by the programme, and place out of competition, and return unopened, any that do not conform to the terms of the programme; to make a selection of one or more designs, as the programme may direct, and to submit his selection, together with his reasons therefor, to the parties instituting the competition.

B. If the proposed work is of sufficient magnitude, a *Jury of Award* of three experts should be put in charge, to consist of the professional adviser of the party instituting the competition, an architect nominated by a vote of the competitors, and a third, also either expert or architect, and chosen by the other two. This jury to have the same duties and powers as above given to the expert adviser.

C. A Standing Committee of Experts, so chosen as to represent the various architectural societies, and exercising the duties of the jury, would give even greater guarantees of fairness and impartiality; and members of this Society are urged to use their influence towards bringing about such united action on the part of other societies as would enable competitors to ask for such a jury.

D. The author of the best design to be appointed the architect of the work, with privilege on the part of the party instituting the competition of having a consulting architect without additional charge to them.

E. The architect of the building to receive *at least* the rates of compensation established by the Schedule of the American Institute of Architects.

F. The Programme to be full and explicit on all the above points, and, besides, to fix a definite time and place for the receipt of drawings, fix an exact limit of cost if practicable, give all useful or necessary information as to lot and surroundings, and as to requirements for occupancy, fix the number, scale and character of drawings, give essential details as to construction and materials, and prescribe definite limits regarding descriptions, estimates, etc., which shall accompany the drawings.

Your Committee further recommends: That a letter or pamphlet be printed, addressed to whom it may concern, and intended to be sent by the Secretary at the request of any member, to any person of or committee contemplating a competition, and offering the services and advice of the Society.

The tenor of such a letter as your Committee recommends would be as given below, and your Committee further recommends, that the form of some such letter having been adopted, the Secretary be instructed to enter into correspondence with other architectural societies, with a view to having their indorsement of our course incorporated in the letter, and also with a view to having similar action taken by them. We recommend, also, that, the above steps having been successfully concluded, a copy of the letter and of the recommendations to members be sent to every practising architect in the country with a request for indorsement or criticism.

In conclusion, your Committee begs to point out that it has thought it wise to follow as closely as practicable the "Code to Govern Competitions," adopted by the Institute, in the *details* of its recommendations while departing radically from the Code in the *scope* and purposes of its efforts.

*S. B.-A. A. Committee on Competitions.*
WM. B. BIGELOW, *Chairman.*
ERNEST FLAGG,
ALFRED H. THORP.

Letter of advice follows: —

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SOCIETY OF BEAUX-ARTS ARCHITECTS.
SECRETARY'S OFFICE.

To.....

Having been informed that you are considering the matter of an architectural competition, for the purpose of obtaining designs and selecting an architect for..... I act in pursuance of a resolution of this Society passed at its regular meeting of..... and send you a copy of resolutions passed by our Society (and indorsed by the following architectural societies), as follows:

*Resolved That:* Our Society wishing in every way to further the advancement of our art, and seeking to benefit the community in which we live as well, we will, through our secretary, be glad to enter into correspondence with you regarding any of the details of the management of a competition, so as to secure the best possible results for all concerned, or we will recommend competent architects to act as judges or expert advisers, or will arrange terms of compensation for such service or for the competitors.

We make no charge whatever, either to you or to any one, acting in this matter solely with a view to establishing a better understanding between architects and their clients, and hoping by our action to help to correct abuses which in the past have made so many competitions abortive.

## COMMUNICATIONS

[*The editors cannot pay attention to demands of correspondents who forget to give their names and addresses as guaranty of good faith; nor do they hold themselves responsible for opinions expressed by their correspondents.*]

### OUR ILLUSTRATED ADVERTISING PAGES.

March 28, 1897.

To the Editors of the American Architect: —

*Dear Sirs,* — I was disturbed the other day to find one of the prints of your series of "Apsidal-Treatment" pictures on the back of an advertising sheet; and though I know that an editor's reasons are cogent and unknown to his readers, I venture to express my woe, for I have been laying that series carefully apart as exceptionally valuable. There are other things that I would cheerfully confer on every reputable advertiser, but these I grudge. I take much pleasure in your illustrations; a part, especially the historical ones, I file away for my own use, and the rest I distribute in charity — I trust nothing is lost. Yours, L.

[We are much gratified to have our own opinion of these illustrations ratified by so competent a critic. "Approbation from Sir Hubert Stanley is praise indeed." We are rather glad, too, that the qualified approval has taken just this form, since it gives us the opportunity to acknowledge, on behalf of the subscribers to this journal, the great obligation they and we are under to the advertisers who share with them and with us the burden and cost of maintaining so expensive a publication as this. Anything that we can, in reason, do to make advertising outlay more productive of return, we are glad to do and, as our action proves, we do not hesitate to squander, as some may think, valuable illustrations on our advertising pages, in the hope that their presence there may be profitable to all our advertisers. — Eds. American Architect.]

## NOTES AND CLIPPINGS

The Borgia Apartments of the Vatican. — To-day (March 8), at the Vatican, in the presence of the Pope, Cardinals and Court, was inaugurated what may, without exaggeration, be called the greatest artistic event of the latter half of the century — that is, the opening of the famous Borgia apartments of the Apostolic Palace, after extensive restorations which have taken four years to complete. The cost has been only £20,000, great economy having been observed. Until a comparatively few years ago, pre-Raphaelite art was held in little regard in the Vatican, as elsewhere, so that previous Popes had not thought it worth while to restore the gorgeous frescos of Pinturicchio that adorned the walls of the various rooms, and were, until the other day, entirely obscured by whitewash, while the precious majolica pavement had been destroyed in part, and in part covered with bricks. Besides, walls had to be pulled down, windows, until then bricked up, opened, all with the utmost care, for fear of damaging the rest of the structure. For this work Leo XIII nominated a committee composed of Count Vespignani, architect, Signor Setz, picture inspector of the Vatican, and Professor Tesorone, director of the Artistic Industrial Museum of Naples. With regard to the latter, it is worth noticing that he is the first Government official employed by the Vatican, and he gained his charge through a competition in which Cantagalli, of the famous majolica works of Florence, was his opponent. However, to Cantagalli was given the restoration of two of the rooms in the Borgia Tower, which is part of the apartments, which consists, besides the tower, of three large halls of 100 square metres each and an immense *salon* called the Hall of the Pontiffs, 250 square metres in size. The rooms of the tower, too, were painted by Biagio di Betto, of Perugia, the companion of Perugino. Of the three large halls, one especially is from the hand of Pinturicchio himself, the principal picture of which represents St. Catherine with Emperor Massamino, the former being a likeness of Lucrezia Borgia and the latter her brother, the famous Cæsar Borgia. In this same hall is a portrait of the master painted by himself, and in another Pope Alexander VI kneeling before a resurrection of Christ. The largest hall was destroyed in the sack of Rome by the Constable of Bourbon in 1527, and was repainted in the middle of the sixteenth century by the well-known artists, Giovanni da Udine and Pierin del Vago. The restoration of the pavements has been a real triumph, as so few traces remained to give an idea of the designs. Professor Tesorone discovered that the ancient majolica tiles had been made in Umbria, probably in Perugia, for Pinturicchio from his designs. The reproduction of these is so perfect that the two cannot be told one from the other. In the Hall of the Pontiffs there were no traces of pavement, and it was thought that, as the hall was painted by Giovanni da Udine, who also painted the Loggie and the little palace of Pius IV in the Vatican Gardens, that it would be best to reproduce their pavements, which are alike. The effect is extraordinarily rich. The base is in terra-cotta mosaic of dark red and grayish yellow, through which run in designs small Spanish majolica bricks in various colors. This kind of pavement is a specialty of the Vatican. In this hall has been hung some very precious tapestry and some recently discovered armor, which is most valuable, one suit, it is said, having belonged to the Constable of Bourbon, and the other to Julius II, the famous warrior Pope, who was made Pope in 1503. The Pope has felt that this restoration is perhaps his most lasting work. He said several times to Professor Tesorone, "Work a miracle, work a miracle; finish before I die." The miracle is accomplished, and the 45,000 tiles of the Hall of the Pontiffs were placed in only one month, working night and day. The apartment is not yet open to the public, and it was only by a special favor that I was allowed to visit it. — *The Pall-Mall Gazette.*

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Great Landslip in Italy. — An extraordinary landslip, or subsidence of earth, has taken place at St. Anna Pelago, in the province of Modena, whereby many hundreds of persons have been rendered homeless. The movement took place over a district embracing seven square kilometres. Signor Pantanelli, professor of geology at the University of Modena, has summed up the nature and extent of the disaster as follows: "The extent of the undermined district, measured on the military maps, is about 220 hectares. Within this space every building of any kind is either fallen, or is in a state rendering demolition necessary. The inhabited houses which have collapsed are 116; with the churches, outbuildings, etc., the buildings wrecked are 182 in number. The main road running through the town, which is the limit of the earthslide towards St. Pellegrino, is entirely destroyed for a distance of about a kilometre, and the cultivated lands are in no better state, being traversed by large cracks and fissures. Not only are the crops for this year entirely lost, but it must be some years before the land recovers its fertility. The gentle declivity — gentle, considering it is on the high Appennines — is an old landslide of scaly clay corresponding to that which, from the base of Satello, descends to Perticara: above the site of its old displacement lie the lakes of Perticciola, a body of water most probably not the least cause of the disaster. The corrosive action of the River Perticara below, and the infiltrations from above, most probably caused the slip. The soil, movable in its origin, soaked with water, and deprived of its support below, entered upon a downward movement, which became so profound as to raise the bed of the river, with its large stones, more than five metres, the pasty clay arising again from under the stones for a considerable tract on the opposite side of the river. The ruin of the district is complete, and the damage may probably be further extended. One hundred and fifty small owners of land, which in that mountainous district is much sub-divided, are ruined." — *Rome Correspondence, London Standard.*

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Recent Discoveries on the Acropolis. — The excavations carried out by the Greek Archæological Society on the northwest slope of the Acropolis have led to some interesting discoveries, according to a correspondent of the London *Times*. Near the Klepsydra, or well mentioned by Pausanias, and at some little height above it, are two caverns which have been generally identified by archæologists as the grotto of Apollo and the grotto of Pan. In the former are many traces of niches made for the reception of votive offerings. It was customary for the archons at the expiration of their year of office to inscribe their names here, either on the rock or on marble tablets. No similar traces, however, are found in the other cavern. The excavations now conducted under the superintendence of M. Kavvadias have revealed two other larger and deeper caverns in the adjacent rock, which are connected by an aperture. This was undoubtedly the shrine of Pan in which Myrrhina (Aristophanes: *Lysistrata*, 911) proposed to Kinesias that their marriage rites should be celebrated. The whole precinct was in all probability originally sacred to Apollo, but when the worship of the Arcadian shepherd-god was introduced at Athens soon after the battle of Marathon the deep recess in the rock, which resembles his shrines elsewhere, was chosen as a suitable sanctuary. A little to the northeast of the grotto has been discovered a flight of steps cut in the rock and apparently leading to the summit of the precipice. The steps can be traced to the base of a buttress of mediæval masonry which supports the wall of Cimon. The upper portion of the staircase, which lies within the wall, was discovered by M. Kavvadias in 1886. It now appears certain that these are the steps by which the Persians scaled the Acropolis, and it also seems probable that this was the passage by which the Arrhephoroe, or sacred virgins, made their annual descent to the precincts of Aphrodite, bearing on their heads the sacred vessels of Athena. — *N. Y. Evening Post.*

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Acetylene Gas and English Fire Insurance. — The insurance offices seem to have at last come to some kind of understanding as to the terms upon which insurance for premises used for the generation or storage of acetylene will be granted, and we understand that the following rules have been drawn up by the Associated Fire Offices: 1. That the storage of calcium carbide, liquid acetylene, and (or) acetylene gas, and every apparatus, whether portable or otherwise, for the generation of such gas, must be only in a building detached at least 10 feet at the nearest point from every other building. 2. That suitable valves or devices for controlling the pressure of the gas must be placed inside the detached building, and a cut-off provided between such building and the building supplied with gas. 3. That in addition to the above, the piping in the building in which the gas is used must be provided with a pipe outlet into the open air, controlled by a safety device so arranged as to let the gas escape outside the building whenever the pressure of the gas exceeds 4 ounces to the square inch. We are further informed that: "The offices agree not to admit liability for explosion of acetylene gas occurring elsewhere than in the building which is, or the contents of which are, the subject of the insurance." — *Invention.*

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Large Landholders in Germany. — Germany's fifteen largest landholders own, between them, 9,000,000 acres of German soil. Prince Wittgenstein has 3,000,000 acres, next comes the Duke of Arenberg with 800,000, then, in order, the Prince of Thurn and Taxis, the Duke of Brunswick, Prince Salm Salm, the Prince of Talleyrand Sagan, who is a French subject; the Prince of Pless, the Duke of Leuchtenberg, Prince Bentheim, Prince Löwenstein, the Prince of Wied (father of the Queen of Roumania) and Prince Fugger. Many of these have large estates outside of Germany as well. — *Boston Transcript.*

S. J. Parkhill & Co., Printers, Boston, U. S. A.

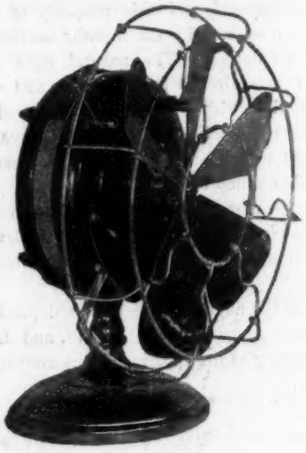
# The American Architect and Building News

ADVERTISERS' TRADE SUPPLEMENT.

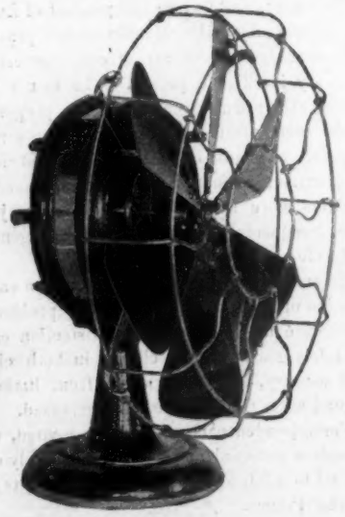
No. 178. SATURDAY, APRIL 3, 1897. Volume LVI. No. 1110.


## FAN MOTORS.

The General Electric Company will, this year, as last, place on the market fan motors for both alternating and direct currents, designating them as General Electric '97 models. They retain the compactness and simplicity of the '96 models, with certain improvements.



The Alternating Current Fan Motor is made for operation on currents of either 60 cycles or 125 cycles. The speed is regulated by an inductive resistance operated by a three-point switch, giving full speed and half speed and cutting off the current at the third point. The presence of this switch allows of



direct connection of the motor to the circuit without the use of a socket-and-plug connection — an appreciable convenience.

The electrical design of this motor follows closely that of the '96 model. The field-core is a ring of iron punchings with inwardly projecting poles carrying the field-coils. The armature is a laminated core through which, near the periphery, are run bare copper rods riveted to copper discs at each end of the core.

There are neither commutator nor brushes — rotation being produced by inductive action. This permits the core to overhang the bearing to such a degree that, together with the fan, a balance is effected; and the motor has but one bearing, long and provided with a self-oiling device, so that it does not heat. The inconvenience of flying oil is entirely done away with by this method. The fan is 10 inches in diameter.

The Direct Current Fan Motor also has but one, self-oiling, bearing. The commutator is completely enclosed and the small carbon brushes are encased in tubes which may be readily unscrewed for inspection. A regulating resistance and switch on the base allows of changes in the speed in the motor. The fan is 12 inches in diameter.

The finish of all '97 fan motors and fans is black Japan, the guard bindings, posts, nuts and screws being nickelled.

GENERAL ELECTRIC COMPANY,
SCHENECTADY, N. Y.

## ROOFING TO LAST.

As a roof to your house is indispensable, why not get the best? One that is fireproof, requires no painting, and will last as long as your house.

Walter's Galvanized Steel Shingles will make such a roof. They were never as good, never as low in price, and transportation never as cheap. Manufactured by The National Sheet Metal Roofing Company. The only side-lock shingle through which water will not seep and that provides perfectly for expansion and contraction of the metal.

Walter's Painted Tin Shingles will give you:

1. A storm and wind proof roof, which will give perfect protection against the elements, and give double the service of ordinary metal roofs.

2. The strongest metal roof in the world, which is attractive, ready to be applied, and does not require skilled labor to apply it.

3. A roofing requiring no fire or soldering-pot, mallets, seamers or tongs, and in which expansion and contraction are provided for in each separate shingle.

4. A roof so perfectly ventilated that rust will not occur on the under side, having one-sixth the weight of slate, one-half of wood, and requires lighter frame-work.

5. A roof more durable and ornamental than it is possible to make a tin roof put on in the old flat-lock or standing-seam style.

6. A roof that is fireproof. Houses covered with them are accepted by fire insurance companies at less rates than houses covered with combustible materials.

7. A roof that will last longer without repairs than any covered with wood or slate, and consequently prevent mottled and cracked ceilings and the decay of rafters and roof boards, caused by frequent leakages.

Manufactured only by

THE NATIONAL SHEET METAL ROOFING CO.,
JERSEY CITY, N. J.

## THE "DORIC" HOT-WATER HEATER.

The "desk" catalogue of the Gurney Heater Mfg. Co. is particularly interesting, since it contains an illustrative description of the "Doric" tubular hot-water heater, patented in 1896, which is designed particularly for small houses and greenhouses.

Disinterested persons who have given the matter careful and intelligent study admit that heating by hot-water circulation is the most effective and successful known, affording, as it does, the greatest facilities for the even distribution of the heat, and permanent maintenance of any desired temperature, either in one, or several adjoining, or in several divisions of the same house, by the same heater. The fact that this system has been universally adopted, both for the small private conservatory and the extensive buildings of the most experienced and successful florists throughout the country, should be convincing evidence in its favor. The chief objection to the system was that of expense, and this we have kept well in view in preparing our price-lists.

Care should always be taken not only to have sufficient radiation in the house, but also a heater of sufficient capacity to carry it easily and maintain a permanent temperature without replenishing the fire for eight or ten hours, and the result will be a satisfactory and economical apparatus, while lack of radiation or heater power on a cold night may cause serious damage to, or even loss of, the entire stock. A well-built flue, and of proper capacity, is also an important requisite, and without it no heating apparatus can work satisfactorily.

We shall always be pleased, on receipt of a sketch with dimensions of the greenhouse, and amount of glass surface, and temperature desired in it, to supply all information regarding the size of heater and quantity of piping required to heat it.

For large heating systems in private residences, greenhouses, or other buildings, etc., double or twin heaters are often preferable and advisable, instead of one large one, as in mild weather one fire may be found sufficient, and considerable economy of fuel secured. Another important advantage obtained by using two heaters, especially in greenhouses, is that the heaters being interchangeable, greater security is assured from any loss resulting from accident during cold weather, as, where the system includes two heaters, one can be operated and heat maintained in the apparatus while repairs are being made to the other.

We manufacture an extensive line of hot-water heaters, which for durability, economy and price compare most favorably with any upon the market, and we recommend them with the utmost confidence in their efficiency to all interested in the most satisfactory and economical system of greenhouse heating.

GURNEY HEATER MFG. CO.,
Boston, Mass.

## THE PAINT FOR 1897.

The finger of science points to Graphite paint as the paint of the future for the protection of all exposed iron and metal work. Professor Spennrath, Director of the Technical School of Aix-la-Chapelle, lately won the $2,000 prize offered by the Society for the Advancement of the Industrial Arts, for the best essay on "Protective Paints." The prize was not won simply by theoretical demonstrations, although the professor furnished scientific reasons also, but by most carefully conducted practical experiments with various pigments and oils, covering several years' time. The results demonstrated that a properly made paint of graphite and boiled linseed oil is the most suitable for protecting structural ironwork, roofs, etc., exposed to the destructive agencies of heat, cold, storms, etc.

Running parallel with these results are the facts demonstrated by those who have used Dixon's Silica Graphite Paint during the past 30 years. Roofs and ironwork properly painted with Dixon's paint have not required repainting in 15 to 20 years. As the season for painting is now close at hand, it may pay those interested to write for circulars to the

JOSEPH DIXON CRUCIBLE CO.,
Jersey City, N. J.

## A 300% INVESTMENT.[1]

In the Michigan Engineers' *Annual*, which is a report of the proceedings of the Michigan Engineering Society, of January, 1889, Prof. M. E. Cooley, M. E., of Ann Arbor, gives the following report of his experience as to the value of covering steam-pipes:

"The benefit of covering steam-pipes to prevent radiation is strikingly illustrated by the following example: The Thomson-Houston Electric-light Plant in Ann Arbor has about 60 feet of 7-inch pipe connecting the boilers with the engines and two large steam-drums above the boilers. In March, 1887, the steam at the far end of this pipe was tested to determine the amount of entrained water, the pipes and drums at the time being uncovered. An average of nine experiments gave 31.01 per cent moisture. In June of the same year, after the pipes were covered with Magnesia Sectional Coverings, the quality of the steam was again tested, the average of five experiments giving 3.61 per cent moisture, the tests were made by the same men from the same connections, and in the same manner. The pipes and steam-drums in March were subjected to a draught, which, of course, aided the condensation. Enough water passed into the cylinders to retard the engines, producing a disagreeable noise. In June the weather was warmer and the pipes and steam-drums were well protected. The quality of steam at the boilers was tested in June, and showed about three per cent moisture. Assuming that 100 I. H.-P. were being developed at the time, and that each horse-power required 30 pounds of steam, then, if the steam is assumed to have 25 per cent entrained water due to condensation in the pipes and connections, 4,000 pounds steam will need be produced in the boilers, or 1,000 pounds more than necessary. To produce this steam will require about 125 pounds of good coal per hour, or 1,000 pounds per day of eight hours. One-half ton per day, at $3 per ton for 300 days, $450, which, at 6 per cent, pays the interest on $7,500. The actual cost of the covering put on complete probably did not exceed $150."

For estimates or other information, address

THE KEASBEY & MATTISON CO.,
Ambler, Pa.

[1] Reprinted from *The American Engineer* of June 12, 1889.

## HOT-AIR ENGINES.

We beg to announce that having purchased the business so long carried on by the De Lamater Iron Works and Rider Engine Co., of New York and Chicago, we have opened branch stores at 191-193 High St., Fort Hill Square, Boston, and 29-31 North 7th St., Philadelphia, where we shall carry stocks of engines and repair parts and all attachments necessary for the installation and repair of our engines. In connection with this we take pleasure in announcing that as a result of our purchase of the two companies named, we are enabled to make a material reduction in prices of Rider and Ericsson Hot-air Pumping Engines, which will remove the only objection ever found with the engines, viz, that of high initial cost. At our new prices people of very moderate means can have a reliable water-supply instead of being compelled to depend upon the cheap and unreliable windmills which have heretofore secured a footing on account of their low first cost. Our office in Philadelphia will be managed by Mr. R. H. Halstead, the Boston office by Mr. W. J. Merriam, gentlemen who have been connected with us for many years and who are thoroughly informed as to the requirements of suburban water-supply.

Full stocks of repair parts, oils, waste, etc., will be carried at each store, and orders for engines and extra parts will receive immediate attention. We wish to call particular attention to the fact that these stores *are not agencies*, but branches under the exclusive control of the Company.

Trusting that the new Company may be favored with a continuation of the favors extended to our predecessors, we remain,

Yours truly,

RIDER-ERICSSON ENGINE CO.,
New York, N. Y.

## ASBESTOS ROOFING.

Heretofore our roofing has been finished by sanding the second coat of roof coating, and afterward applying a fireproof coating.

Our latest improvement consists in sanding the second coat of roof coating with our "Asbestic" (fine-ground Asbestos) which forms the final and finishing coat, a sufficient quantity of which will be sent with all shipments — about 12 to 15 pounds are required for 100 square feet.

The "Asbestic" forms a tough and felt-like surface, which is practically indestructible, and saves the labor and time heretofore required to mix and apply the fireproof coating.

The "Asbestic" (finishing coat) has been thoroughly tested for several years, but until recently we have not been able to supply it at a price which would permit of its general use for roofing purposes.

Believing our customers will appreciate the importance of our improved finishing coat, which forms a more substantial surface than has ever before been produced, as well as the greatly reduced cost of applying our Asbestos roofing, we remain,

H. W. JOHNS MFG. CO.,
New York, N. Y.

## LUXFER PRISMS.

WHAT THEY ARE AND SUGGESTIONS REGARDING THEIR UTILITY.

When a ray of light passes from one transparent medium, such as glass or water, to another, it undergoes a change of direction at the surface of separation. This change of direction of light rays is called refraction.

The knowledge of this property of light has been utilized in the Luxfer method of lighting buildings. The natural light of a room comes directly from the sky, and striking the floor within ten or twenty feet of the window is almost entirely lost. The quantity of light utilized is very small in comparison with that which enters the window.

In the new system the light is received upon a plate of prisms, and under the laws of refraction is diverted and borne back into the room.

Upon the angles of the prisms depend the angles of the refraction of light, and hence the lighting of that portion of the interior required.

No light is lost; no light is created; but through the Luxfer Prisms daylight is diffused uniformly throughout the interior space.

Architects and owners will at once appreciate the great practical value of a simple, certain method of giving to interiors the great desideratum of natural light. Prisms, without loss, without any cost of maintenance, displace gas and electric lights, and in their place give pure, healthful light.

To tenants and owners the product of Luxfer Prisms offers almost innumerable practical advantages, which are at once suggested to every intelligent person. The owner of undesirable premises can have his property made remunerative at comparatively small expense. Tenants of offices, stores, factories, or apartments can reduce expenses, transact business more satisfactorily, and can enjoy more freedom from disease through the agency of Luxfer Prisms.

To architects our product presents an easy solution of one of the most vexed problems heretofore unsolved. Great satisfaction can be safely guaranteed to clients, in both city and country, and the income from limited ground areas can be materially increased.

Correspondence is particularly invited, although a personal inspection is absolutely essential to a fair appreciation of the results of Luxfer Prisms.

The product is scientific in origin and character. Every building to be lighted by our system presents a problem to be considered by itself from a scientific standpoint. The

Prisms necessary for a required result differ radically, according to the general existing conditions at and surrounding the premises to be lighted. For this reason it is impossible to make an estimate upon the cost of any proposition until after the report of one of our corps of scientists, covering the number and kind of Prisms required to refract the light rays in the volume and to the points required.

Remember Luxfer Prisms do not create light, but if placed where reached by a fair volume of light from the sky will transfer that light back where needed, even to a distance of two hundred feet, where the conditions are favorable.

DESCRIPTIVE.

Luxfer Prisms are a scientific product of plates of glass with semi-prisms comprising one face.

The plates are electrically glazed together into whatever form and size may be required, and are then surrounded with a suitable metal frame. The completed frame of prism plates may be either hung in the window frame or inserted in the sash in place of the sheet of plate-glass.

The remarkably valuable qualities of the light-bearing prisms have been materialized into practical form through the agency of the Winslow process of electric glazing. Through the magic power of electricity, the edges of the prism plates are so wielded together by a narrow line of copper that the finished product is not only attractive in appearance, but has also the desired stiffness for use in even very large frames. This result is in marked contrast with the weak, unsightly lead or zinc process made familiar in colored glass work.

TESTIMONIALS.

CHICAGO, ILL., February 12, 1897.

LUXFER PRISM CO.:—

*Gentlemen,*—We have examined with great pleasure and interest your different exhibits where dark spaces have been lighted by your prisms, and are so favorably impressed that we are at this moment arranging for the using of these prisms in the upper sash of the court windows in the additional stories to the Royal Insurance Building in this city.

The necessity of additional light in these court-rooms was very apparent, and we saw no solution to the problem until we examined your exhibits. We are also arranging for their use in the upper sash in the dining-room windows of a fine residence on Grand Boulevard, where the light was deficient, owing to the near proximity of the adjacent building. Your proposition to have the prisms polished like plate-glass and set in handsome metal frames removes the only objection that we saw to their use in fine residences. Very respectfully yours,

JENNEY & MUNDIE, *Architects.*

CHICAGO, ILL., December 31, 1896.

SEMI-PRISM GLASS CO., Chicago:—

*Gentlemen,*—The occupants of the offices and basement at the C. & N.-W. R'y Co.'s office-building, 22 Fifth Avenue, are so pleased with the results accomplished by the samples of your prismatic lights, which you placed in position there some time since, that in behalf of the company I would now like to receive from you an estimate for placing additional lights in position for the purpose of bringing natural light into a number of additional offices.

The practical results seem to be, as you claim, much better natural light, which is superior for working purposes, also a material saving in cost over artificial light.

Will you have your proper representative take up this matter in the near future, and oblige,

Yours very truly, CHAS. S. FROST, *Architect.*

CHICAGO, ILL., January 14, 1897.

SEMI-PRISM GLASS CO., Chicago:—

*Gentlemen,*—I examined with great pleasure and interest your exhibition at 170 Lake Street, and was most favorably impressed with the value of your lighting system.

It is my opinion that this system of introducing light and dissipating gloom promises to revolutionize the planning of all kinds of business buildings, and may have a good effect upon dwelling houses as well.

Much waste space can be reclaimed, space now given up to light courts may be utilized in prospective buildings, not to mention the merits of your system as a rival to the electric-light companies.

From what I saw demonstrated at your place I should feel justified in according even higher commendations.

Yours truly, S. S. BEMAN, *Architect.*

TORONTO, CAN., February 2, 1897.

LUXFER PRISM CO., Toronto:—

*Gentlemen,*—The prisms installed in our stores are giving very satisfactory results. A tangible proof of their utility is shown in a comparison between our Queen and Yonge Street sections. The window frontages and the facilities for lighting through ordinary glass are about the same in these two sections. In the Queen-Street section, where the prisms are installed, good light is carried back to the rear of the store. There are no light wells and we require no artificial light. In the Yonge-Street section, where ordinary glass is still used, we have three large light wells extending through all the floors, which occupy a floor area of 3,000 square feet. In this section we burn more or less artificial light all the time.

The sidewalk prisms used on our Queen and James Street fronts are giving satisfactory results.

Yours truly,

WILSON PHILLIPS, *Mech. Supt.*

TORONTO, February 2, 1897.

LUXFER PRISM CO., Toronto:—

*Gentlemen,*—Regarding our experience with the use of the prisms you installed in transoms and rear windows on ground floor of our store a little over a year ago, we may say:

When the prisms were put in we were doubtful as to cleaning. Our experience is that the light is not interfered with by any ordinary accumulation of dust, and where cleaning is necessary a light brushing is sufficient. We have not yet washed the prisms, although they have been in use now over a year.

With regard to other advantages, we may mention the general attractiveness given to the premises, which in itself is a valuable feature, and the saving in cost of artificial light. The latter has been very marked in our case, although the position of our store, being on the corner of two wide streets, has all the advantages for light from ordinary glass.

Yours truly,

THE ROBERT SIMPSON CO. (Lim.)

LUXFER PRISM CO.,
CHICAGO, ILL.

## NOTES.

THE Westinghouse Machine Company's foreign business steadily increases. The Paris Agency recently sold four Westinghouse compound engines aggregating 1100 horse-power, for electric railway service in Russia.

HENRY R. WORTHINGTON, manufacturers of steam and electric pumping machinery, have recently received a contract from the Newport News Ship Building & Dry Dock Co., amounting to $100,000, covering pumps for the United States battle-ships, "*Kearsarge,*" "*Kentucky*" and "*Illinois.*" They are also building the pumps and pumping machinery for the United States battle-ship "*Alabama,*" now being constructed by the Wm. Cramp & Sons' Ship and Engine Building Co. The contract for the pumps for this vessel amounts to $33,000. The company have just completed and delivered the hydraulic machinery for operating the turrets on the United States battle-ship "*Iowa.*" They have more recently received a contract amounting to $15,000, covering the pumps required for the armored cruiser being built by the Wm. Cramp & Sons' Ship and Engine Building Co., for the Japanese Government. The "*Yoshi-No,*" another Japanese cruiser, is already fitted out with a full complement of Worthington pumps. The fact that with few exceptions all British and other foreign war vessels are equipped with these machines simply adds another testimonial to the high efficiency of the Worthington Duplex Steam Pump.

HENRY R. WORTHINGTON,
BROOKLYN, N. Y.

WHILE we may be allowed to doubt the wisdom of publishing trade catalogues in sumptuous and expensive form, perhaps we know less of the economics of the matter than those manufacturers who expend large sums in this form of advertising.

Be this as it may, we must acknowledge that the American Radiator Co. has issued a trade catalogue that in all that concerns mere bookmaking is a model of good taste. Much pains have been taken in the selection of type, the rubrication and spacing, and the perspicuity with which tabular matter has been arranged, is commendable.

As to illustrations, the large line of radiators of various patterns and decorations could hardly be better shown than by the many large half-tone cuts and steel-engravings.

THE success of the operation of long-distance electrical transmission is perhaps best gauged by the opinion expressed by the Company operating the plant. An extract from a recent letter regarding the operation of the Fresno, Cal., long-distance transmission may be interesting to our readers. It was written by Mr. John J. Seymour, President of the San Joaquin Electric Company, operating the San Joaquin River—Fresno transmission, to the General Electric Company, which installed it.

"It affords me great pleasure to write you regarding the successful operation of the long-distance transmission plant installed for our Company. The entire plant as furnished has been in actual practical operation for a period of several months. The 35 miles transmission has given us no trouble whatever. Our load at present consists of 145 arc-lights and 5,000 incandescent-lights and 410 horse-power in motors, the latter including 180 horse-power for the Sperry Flour-mill and 75 horse-power for the City Pumping Plant. All of the machinery doing this work has worked with perfect success from the start.

"The incandescent-lights have most of them been newly wired in, thus enabling us to properly balance the load, and the regulation has given us no trouble whatever. During extensive tests, it was impossible to find more than two volts variation between any lamps on the system. Lights so furnished seem to me to be better than incandescent-lights usually furnished in San Francisco and other cities of the State."

## BUILDING INTELLIGENCE.

(*Churches Continued.*)

**Grosse Pointe, Mich.**—Stone church, $25,000; own., St. Paul's Roman Catholic Society; arch., Harry J. Rill, Detroit; not let.

**New York, N. Y.**—*Forty-first St.*, nr. 9th Ave., three-st'y brick church, 84' x 98'; $56,000; own., Collegiate Reformed Church, 113 Fulton St.; arch., Edgar K. Bourne, 18 Broadway.

### EDUCATIONAL.

**Boston, Mass.**—*Chestnut Hill Ave.*, Ward 25, two-st'y frame school., 45' x 90', pitch roof, hot water; $15,000; own., City; bld., A. B. Murdough, Watertown; arch., L. H. Bacon.

**Danvers, Mass.**—Two-st'y four-room frame school., 45' x 70', hip roof, steam; $10,000; own., Town; arch., Wm. H. Peare; not let.

**New Bedford, Mass.**—*Brock Ave.*, two-st'y 8-room brick school., 80' x 100', slate roof, steam; $35,000; own., City of New Bedford; bld., J. B Sullivan; arch., C. Hammond & Son.

**Philadelphia, Pa.**—*Norris St.*, n w cor. 15th St., three-st'y and basement stone and brick public school house, tin roof; own., Board of Education, 713 Filbert St.

*Knox St.*, cor. Seymour St., three-st'y and basement stone and brick public school., 22d section, tin roof; own., Board of Public Education, 713 Filbert St.

### FACTORIES.

**Cincinnati, O.**—*Third St.*, four-st'y brick factory, 44' x 95'; $5,000; own., J. F. Dietz; con., Kittle Orr & Co; arch., Harry Hake.

**Philadelphia, Pa.**—*Race St., No.* 932, four-st'y iron and brick factory; own., M. Bear; arch., Henry D. Dagit, 706 Walnut St.

*Thirteenth St.*, nr. Filbert St., nine or ten st'y and basement iron, brick and terra-cotta factory and office-building; own., Gibson Estate, care of Fidelity Trust and Safe Deposit Co., 333 Chestnut St.; arch., Hewitt Bros., Bullitt Building.

### HOTELS.

**Chicago, Ill.**—E. H. Richardson, three-st'y brick private hotel, 235 Ashland Boulevard; $8,000.

### HOUSES.

**Baltimore, Md.**—Eleven two-st'y brick dwel's., beg. s e cor. Fulton Ave. and Northwest St.; own., E. J. Roberts; 1142 East North Ave.

**Boston, Mass.**—*Park St.*, nr. Waldeck St., Ward 20, two-st'y frame dwell., 31' x 36', gambrell roof; $5,000; own., A. L. Jewell; bld., A. B. Gould, 7 Freeman St.

*Parker Hill Ave.*, nr. Huntingdon Ave., Ward 19, three-st'y frame dwell., 27' x 51', flat roof, furnace; $6,000; own., Philip Kresser, premises; arch., George Zunner; not let.

*Chambers St. Ct., Nos.* 2-5, Ward 8, 4 three-st'y brick dwells., flat roofs, stoves; $24,000; own. and bld., Abraham Diamond, 15 Spring St.

*Centre St.*, nr. Seaborn Ave, Ward 24, two-st'y frame dwell., 26' x 51', pitch roof; $5,000; own., Sarah Eaves, 23 Ashmont St.; bld., W. E. Morrison.

*East Seventh St., Nos* 403 405, Ward 14, 2 three-st'y frame dwells., 22' x 57', flat roofs, stoves; $10,000; own. and bld., Arthur H. Flint, East 5th St.

*Gleason St.*, Ward 20, two-and-one-half-st'y frame dwell., 37' x 72', pitch roof, furnace; $7,000; own., F. E. Evans; arch., A. B. Pinkham, 43 Warren St.

*Dix St., No.* 39, Ward 24, three-st'y frame dwell., 27' x 54', flat roof, stoves; $5,000; own. and bld., P. O'Hearn, 14 Arcadia St.

(*Continued on page* 8.)

GRILLE AND FRAME, 5 FT. 9 IN. WIDE BY 6 FT. 1 IN. HIGH

FOR

## COLORADO STATE CAPITOL,

**DENVER, COLO.**

JAMES MURDOCH, Architect.

## Executed in Aluminum Brass

**The metal of which the above is made is a mixture of pure ingot copper and pure aluminum. It is gold color and retains its color well; its fluidity when molten enables it to receive and convey the finest lines of the modeller; it is tough and strong and is in every way beautiful and well suited for architectural uses.**

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## THE SNEAD & CO. IRON WORKS,

**LOUISVILLE, KY.**

Structural and Ornamental Metalwork for Architectural Purposes.


From "The Builder."

MEMORIAL TOMB TO SIR HENRY OGLANDER: BRADING CHURCH, ISLE OF WIGHT.
J. C. POWELL, ARCHITECT; H. A. PEGRAM, SCULPTOR.

## BUILDING INTELLIGENCE.

(*Houses Continued.*)

*Waldeck St.*, nr. Park St., Ward 20, two-st'y frame dwell., 31′ x 36′, gambrel roof, furnace; $5,000; own., A. L. Jewell; bld., A. B. Gould.

*Boylston Terrace*, nr. Centre St., Ward 22, two-st'y frame dwell., 32′ x 41′, pitch roof; $5,000; own., Wm. S. Mueller, 227 Washington St.; bld., S. F. Chipman.

*Parker Hill Ave.*, nr. Tremont St., Ward 19, two-st'y frame dwell., 25′ x 51′, pitch roof, stoves; $5,000; own., Delia F. Gilligan; bld., John M. Kelley, Roslindale.

*Washington and Walton Sts.*, Ward 24, 4 three-st'y frame dwells. and stores, various dimensions, flat roofs, stoves; $18,000; own. and bld., Jas. F. Haddock, 625 Washington St.

*Hastings St.*, nr. Centre St., Ward 23, two-st'y frame dwell , 32′ x 39′, pitch roof, hot water; $5,000; own. and bld., C. W. Whittemore, 25 Hastings St.; arch., James Murray.

*Excelsior St.*, nr. Geneva Ave., Ward 20, two-st'y frame dwell., 34′ x 27′, pitch roof, furnace; $5,000; own., Abigail A. Q. Turner; bld., Howard Bros., 412 Dorchester Ave.

*Harvest St.*, nr. Dorchester Ave., Ward 16, 4 two-st'y frame dwells., 25′ x 41′, pitch roofs, furnaces; $20,000; own. and bld., R. H. McDowell, 6 Armandine St., Dorchester.

*Holbrook St., No.* 43, Ward 23, two-st'y frame dwell., 20′ x 46′, pitch roof, furnace; $5,500; own., Abner Blackburn; bld., M. A. Blanchard, 91 Boylston St.

**Brockton, Mass.** — *Highland Terrace*, two-and-one-half-st'y frame dwell., 40′ x 48′, hip roof; $5,000; arch., W. V. Howard, 47 Centre St.; not let.

*Monson St.*, two-and-one-half st'y frame dwell., 25′ x 42′, pitch roof, furnace; $5,000; own. and bld., H. R. Dimmock; arch., W. V. Howard.

**Chelsea, Mass.** — *Harvard St.*, two-and-one-half-st'y frame dwell., 28′ x 42′, pitch roof, furnace; $5,000; own. and bld., Walter D. Grover, Franklin St.

**Chicago, Ill.** — W. J. Dowd, three-st'y brick dwell. and barn, 4320 Wabash Ave.; $5,000.

H. W. Sweeney, 4 two-st'y brick dwells., 148-154 West 68th Sts.; $6,000.

**Cincinnati, O.** — *Prospect Ave.*, two-and-one-half-st'y brick dwell., 29′ x 44′; $5,000; own., Frank Guhman; con., Chas. Glemser; arch., J. J. Rueckert.

*Highland Ave*, two-and-one-half st'y brick dwell., 42′ x 32′; $5,000; own., Elenora C. Alms; con., W. A. Stewart's Sons; arch., Des Jardins & Hayward.

*Eighth and Purcell Aves.*, 4 two-and-one-half-st'y brick dwells., 80′ x 35′; $6,500 each; own., Jno. G. Murdock; con., W. C. Ballville; arch., Saml. Hannaford & Sons.

*Wallace Ave.*, two-and-one-half-st'y brick dwell., 30′ x 53′; $5,000; own., E. Moch; con., M. Marcus; arch., M. E. Clements.

**Laconia, N. H.** — Two-and-one-half-st'y frame dwell., 52′ x 60′, pitch roof, steam; $10,000; own., Addison Cook; arch., Fuller, Delano & Frost, Worcester; day-work.

**Lynchburg, Va.** — *Church and Eleventh Sts.*, three-st'y brick, brownstone and terra-cotta dwell., 40′ x 76′, tile r of; own., Dr. A. W. Terrell; bld., Wilson & Seay; arch., J. M. B. Lewis.

**New Bedford, Mass.** — *Cottage St.*, two-and-one-half-st'y frame dwell., 38′ x 40′, shingle roof; $6,000; own., Dr. W. R. Channing; arch., Nathl. C. Smith.

*Purchase St.*, two-and-one-half-st'y frame dwell., 48′ x 50′, pitch roof; $7,000; own., D. H. Waite; bld., H. McB. Smith; arch., C. Hammond & Son.

**New Haven, Conn.** — *Savin Rock*, two-and-one-half-st'y frame dwell., 40′ x 40′, pitch roof, comb. heat; $5,000; own., Andrew Hendrix, 18 Anderson St.; arch., W. E. Augur, 852 Chapel St.

**New Rochelle, N. Y.** — *Neptune Park*, three st'y stone and frame dwell.; $15,000; own., Louis Wertheimer, 165 Broadway, New York City; arch., Arthur G. C. Fletcher, 42 East 23d St., New York City.

**Newton, Mass.** — *Wabun St.*, two-st'y frame dwell., 38′ x 38′, hip roof, furnace; $5,000; own., arch. and bld., Herbert Mosely, 50 Bromfield St., Boston.

**New York, N. Y.** — *Seventieth St.*, w West Central Park, 2 four-st'y brick dwells., 21′ x 60′; $44,000; own., Peter Wagner; arch., Robert Wallace.

*One Hundred and Nineteenth St.*, 225′ e 7th Ave., 5 brick dwells ; $80,000; own., Geo. W. Ruddell; arch., A. H. Taylor.

*One Hundred and Eighteenth St.*, nr. Lenox Ave., 5 three-st'y brick dwells , 20′ x 53′; $75,000; own. and bld., P. H. Lynch, 642 West 138th St.

**Nyack, N. Y.** — Two-and-one-half-st'y stone and frame dwell.; $30,000; own., Rev. A. B. Simpson, 250 West 44th St., New York City; arch., Woodruff Leeming, 130 Fulton St., New York City.

**Providence, R. I.** — *Manning St.*, two-and-one-half-st'y frame dwell., 36′ x 52′, pitch roof, furnace; $5,000; own., Mrs. Mary E. Hefferman, 359 Pine St.; bld., Bowen & Doane.

**Revere, Mass.** — *Crescent Beach*, two-and-one-half-st'y frame dwell., 44′ x 65′, steam; $6,000; own., C. S. Brown; bld., A. D. Flanders, Lynn; arch., Geo. E. Smith, Lynn.

### MERCANTILE BUILDINGS.

**Boston, Mass.** — *Atlantic Ave.*, cor. Congress St., Ward 7, seven-st'y brick building, 185′ x 183′ x 90′, flat roof, steam; $100,000; own., Boston Real Estate Trust; arch., Peabody & Stearns; not let.

**New Bedford, Mass.** — *Pynchon St.*, five-st'y brick and iron block, 62′ x 84′, comp. roof, steam; $50,000; own., Frank R. Slocum; bld., C. O. Brightman; arch., Nathl. C. Smith.

**Providence, R. I.** — *Green St.*, three-st'y brick block, 70′ x 75′, flat roof, steam; $15,000; own., Julia P. Anthony, 120 Courtland St.; bld., N. I. Tallman.

*Westminster St.*, six-st'y brick and iron block, 100′ x 150′, flat roof, steam; $100,000; own., J. E. Studley, 204 Westminster St.; bld., Horton & Hemmingway; arch., Martin & Hall.

**West Winsted, Conn.** — Two-st'y brick and stone bank building, 25′ x 89′, slate roof, steam; $20,000; own., Hurlbut National Bank; arch., W. E. Griggs, Grand St., Waterbury; not let.

### OFFICE-BUILDINGS.

**Boston, Mass.** — *Doane St.*, cor. Kilby St., Ward 6, eight-st'y office-building, 20′ x 18′ x 50′ 8″, flat roof, steam; $75,000; own., Helen M. Hunt, Hotel Victoria; bld., Jas. Smith; arch., Winslow & Wetherell.

**Chicago, Ill.** — C. C. Heisen, fourteen-st'y brick office-building, 368 Dearborn St.; $200,000.

C. C. Heisen, fourteen-st'y brick office-building, 388-392 Dearborn St.; $200,000.

C. C. Heisen, fourteen-st'y brick office-building, 275-277 Dearborn St.; $200,000.

C. C. Heisen, fourteen-st'y brick office-building, 251-253 Dearborn St.; $200,000; Perley Hale, archt. of above four buildings.

Benj. N. Branch, Jr., thirteen-st'y brick office-building, 68-72 Dearborn St.; $180,000; F. & E. Baumann, archts.

**New York, N. Y.** — *Broadway, Nos.* 290-294, fifteen-st'y brick and stone office-building, 60′ x 130′; $1,000,000; own., R. G. Dun; con., W. A. & F. E. Conover; arch., Harding & Gooch.

**Philadelphia, Pa.** — *South 12th Sts., No.* 201, five-st'y mottled brick, terra-cotta and limestone office-building; own., Geo. M. Wagner; arch., McCollin & Fast, Fidelity Mutual Bldg.

### STABLES.

**Basking Ridge, N. J.** — Two-st'y stone and frame stable, 40′ x 100′; $10,000; own., S. S. Childs, 45 Cortlandt St., New York City; arch., C. Abbott French, 1 Madison Ave., New York City; not let.

**Boston, Mass.** — *Norfolk St., No.* 299, Ward 24, frame stable, 24′ x 20′; $800; own. and bld., Jas. E. Wilber, premises.

*Island St.*, nr. Gerard St., Ward 17, frame stable, 17′ x 14′; $300; own., C. J. Campbell, 12 Island St.; bld., E. S. Baker.

*Merriam St.*, Ward 22, two-st'y frame stable, 20′ x 23′; $1,000; own., George Pensborn, Boylston St., Jamaica Plain; not let.

**Brookline, Mass.** — *Warren St.*, one-and-one-half-st'y frame stable, 47′ x 46′, hip roof; $2,700; own., Francis A. White, Warren St.; bld., B. W. Neal, Jr., 293 Boylston St.

**Cambridge, Mass.** — *Mill St., No.* 8, two-st'y frame stable, 76′ x 76′, pitch roof, stoves; $2,000; own., L. E. Hartshorn, 40 Erie St.; bld., Nelson Rice.

**Everett, Mass.** — *Prescott St.*, nr. Main St., two-st'y frame stable, 25′ x 32′; $800; own. and bld., August Neilson, 14 Prescott St.

*Court St.*, off Main St., one-and-one-half-st'y frame stable, 24′ x 34′, pitch roof; $400; own., Everett Ice Co.; bld., J. F. Vanderhoof.

**Medford, Mass.** — *Spring Ave. and Hicks St.*, one-and-one-half-st'y frame stable and carriage-shed, 28′ x 30′, pitch roof; $400; own., J. A. Durrell, 309 Broadway, Somerville; bld., John K. Ricker.



## BUILDING INTELLIGENCE.

(*Stables Continued.*)

**New York, N. Y.** — *Fourth St., Nos.* 188-190, six-st'y brick, stone and iron stable and wagon repository, 41′ x 100′; $35,000; own., Mrs. A. Halanan; arch., Chas. Rentz, 153 Fourth Ave.

**Philadelphia, Pa.** — *Mather St.*, s s, e 24th St., two-st'y brick stable, 100′ x 85′; own., Philip Haibach, s e cor. Thompson and 26th Sts.

*Master St.*, s s, extending through to Ingersoll St., bet. 24th St., two-st'y brick stable and wagon house, 100′ x 85′; own., Chas. & Wm. Freihoper; cost about $19,000; cont., Philip Haibach, s e cor. Thompson and 26th Sts.

**Torresdale, Pa.** — Two-st'y frame and brick stable, shingle roof; con., Rupell R. Robinson; own., Mrs. Mamie M. Coates; arch., Geo. I. Lovett, 424 Walnut St., Philadelphia.

### STORES.

**Chicago, Ill.** — Chas. Kantz, three-st'y brick store and flats, 2557 Emerald Ave.; $5,500.

P. S. Willis, three-st'y brick store and flats, 1464 Thirty-fifth St.; $5,500.

W. W. Nutting, three-st'y brick salesrooms, 296 Jackson Boulevard; $7,000.

**Cincinnati, O.** — *Sixth St.*, three-and-one-half-st'y brick store and flat building, 27½′ x 94′; $7,500; own., Chas. D. Jones; con., Furste & Son; arch., E. Schlochtermeyer.

*Hamilton Ave.*, three-st'y brick store, 28′ x 76′; $5,000; own., Dr. Huelsmann; con., John Rolfes; arch., A. Kunz.

**Ocean City, N. J.** — Two-and-one-half-st'y frame and brick store and dwell., 20′ x 43′; $5,000; own., Mrs. A. W. Steinmentz, Philadelphia; arch., Steelman & English.

**Philadelphia, Pa.** — *Germantown Ave., No.* 2726, three-st'y and basement brick store and dwell., galvanized iron cornice and tin roof, 20′ x 63′; own., Thos. P. Hunter; arch., John Ord.

### TENEMENT-HOUSES.

**Buffalo, N. Y.** — *Niagara St.*, nr. Georgia St., four-st'y brick tenement; $19,000; own. and bld., H. J. Tharle.

*Oakland Pl.*, nr. Summer St., two-st'y frame flat; $10,000; own. and arch., Wm. Lansing; bld., C. Berrick's Sons.

### WAREHOUSES.

**Baltimore, Md.** — Six-st'y brick warehouse, 47′ 5″ x 173′, s s Baltimore St., bet. Green and Arch Sts.; own , Geo. Bloone & Son, 619-621 West Baltimore St.

**Philadelphia, Pa.** — *Callowhill St., No.* 705, three-st'y brick storehouse, 19′ x 104′; own., Keystone Refrigerating Co., 6-9 "Bourse."

*Jefferson and Randolph Sts.*, five-st'y beer storage house; own , Mrs. A. Vollmer; con., Philip Haibach, s e cor. Thompson and 26th Sts.; arch., A. C. Wagner, 514 Walnut St.

### MISCELLANEOUS.

**Boston, Mass.** — *Baker St.*, nr. Germania St., Ward 22, two-st'y brick bakery, 36′ x 47′ x 100′, flat roof, steam; $18,000; own., Franklin Brewing Co.; arch., George Zunner, 1117 Columbus Ave.; not let.

**Bridgeport, Conn.** — *Black Rock*, two-and-one-half-st'y frame boat club-house, 70′ x 90′, pitch roof; $10,000; own., Bridgeport Yacht Club; bld., W. S. Hurlburt.

**Cincinnati, O.** — *Hulbert St.*, two-st'y brick bowling alley, 50′ x 78′; $6,000; own., West End Bowling Club; con., Jno. B. Dreyer; arch., E. H. Dornette.

**Galveston, Tex.** — *Ave. A. and 17th St.*, three-st'y brick annex to jail, fireproof construction; $32,000; own., Galveston County; bld., Pauly Jail and Mfg. Co., St. Louis.

**New York, N. Y.** — *Sixty-seventh St.*, nr. Lexington Ave. five-st'y brick building, 41′ x 40′; $25,000; own., Deaf Mute Institution Corporation; on premises; arch., Alfred Zucker, Decker Building.

**Philadelphia, Pa.** — *Buttonwood St.*, s e cor. 15th St., two and three st'y boiler and brass shop, 179½′ x 344½′; $88,000; own., Baldwin Locomotive Works; con , H. C. Roydhouse, Arey & Co., Master Builders Exchange.

*Pennsylvania Ave. and 20th St.*, machine shop; Bement & Miles; $75,000; con., P. H. Flynn & Co.