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TWO serious fires have occurred within a short time in hotels, and the question of protecting hotel guests has, in consequence, come up again for discussion in the newspapers. In the case of the Park Avenue Hotel, which was built, thirty years ago, for a fireproof structure, and was well supplied with brick partition walls, the fatal defect seems to have been in the windows. Those on the side toward Park Avenue gave way immediately before the flames blown across the street from the burning armory building on the other corner, and the curtains, furniture and woodwork were soon in a blaze. The windows opening on the interior court were, in their turn, quickly destroyed, on both sides, spreading the fire all over the building, although the floors were of masonry, and a fire originating, let us say, in the basement of the hotel would have had great difficulty in extending beyond the room in which it originated.

THIS has been the history of so many destructive conflagrations, particularly those in buildings intended to be fireproof, that experts have long agreed that no structure in a closely-built city can be considered even approximately secure against fire, so long as it is provided only with ordinary windows. Shutters, of iron, or of wood covered with tin, will protect windows if they are used; but, in practice, such shutters are out of the question for a hotel, and the only resource available in their place is the use of wired glass. That such glass, if set in metal sashes, and these in metal frames, will keep out fire as effectually as ordinary shutters, has been many times demonstrated, and, if it were not for its unattractive appearance, and its disposition to crack over the wires, the wired glass would be used very extensively, on the advice of architects. The latter, however, are obliged to consult the wishes of their clients in regard to the appearance of their buildings, as well as in regard to its security from fire, and clients who are satisfied with a network of chicken fencing in their front windows, diversified with cracks and bubbles, are rare. Nevertheless, the protection which it affords is so valuable that, if means could be found for making it even tolerably ornamental, its use would be greatly extended; and it does not seem impossible that such means might be found. Some of the glass set in small pieces in copper bars is extremely pretty, besides being nearly as fireproof as the wired glass; and, if manufacturers were disposed to take up the matter, there are plenty of architects who could furnish designs for imbedding in the melted glass an ornamental pattern in wire. In this, or some similar way, using also metal-covered doors and metal trim, hotels could be made really fireproof; and it does not seem unreasonable to suggest that the next amendment to the Building Laws might well take the form of a prohibition of the use of wooden window frames or sashes, or of glass in pieces of more than nine square inches, in any outside or courtyard wall of any hotel. That there would be resistance to such an enactment from the proprietors of stores on the street floors of hotels, and, possibly, from hotel landlords and their guests, is certain; but the latter would soon become accustomed to the change, and would probably find æsthetic attraction, as well as consciousness of safety, in the subdivided glass, and the objections of the former should not be considered in comparison with the safety of the hotel guests whose lives are imperilled by every sheet of plate glass in the building to which they entrust themselves.

A CASE heard in London, on appeal from the decision of a District Surveyor, has a considerable technical interest. Every one has heard of the Rowton Houses in London, where poor people are lodged and fed at a cheap rate, very much as they are in the Mills Hotels in New York. The architect of one of the houses, now in process of erection, designed a geometrical staircase, consisting of steps and landings of artificial stone, made with a core of "breeze" and Portland cement, surrounded with a finishing layer of cement and sand, and containing iron angle-bars, or, rather, bedstead-irons, in each step, the steps and landings being wedged into the wall at one end, but unsupported at the other, except that each step was notched on the one below. The District Surveyor objected to this construction, and directed that a steel or iron string should be put under the outer end of the steps, and a beam under the landings. This order was not obeyed, and, on his rejecting the staircase, an appeal was taken, as provided by the law. The Tribunal of Appeal is composed of experts in construction, and, after hearing a great deal of evidence on both sides, unanimously decided that the staircase was defective, and that the order of the District Surveyor should be carried out.

THE reasons given for this decision are instructive. The Tribunal was of opinion that a staircase of the same form, if made with concrete of uniform quality, would be safe; but the combination of a core of the soft and unreliable coke-breeze with an outer shell of hard concrete, of granite chips and cement, they thought likely to cause cracks, through the unequal shrinkage of the two kinds of material, and it appeared that in other staircases, built in the same way, transverse cracks had already shown themselves. The angle-irons were considered by the Tribunal to be of very doubtful value. The architect thought that the concrete adhered perfectly to them, although, instead of new angle-irons, old bed-irons, which had once been japanned, were used; but the Tribunal believed that the tendency of such irons to start a seam in the concrete in the direction of their surfaces was a source of danger, and that wires were to be preferred. A calculation of the strains and resistances of the steps was made, regarding the steps as independent cantilevers, from which it appeared that, when covered with a crowd of people, the tensile strain on the upper part of the step would be one hundred and eighty pounds per square inch, while the safe resistance of the concrete would be only one hundred pounds to the square inch. We should ourselves think one hundred pounds per square inch much too large an estimate of the safe resistance of concrete made with such a miserable material as coke-breeze; but, on the other hand, it is rather absurd to calculate a geometrical staircase, each step of which rests for its whole length on the step below, as a succession of independent cantilevers. However, the Tribunal, on inspecting the staircase in question, after a test had been made by loading it with brick to an extent only a little greater than the actual weight of a crowd, found that one of the joints between a step and a landing had opened throughout its whole length, probably through the crushing of the soft interior mass under the combined effect of the dead weight and the torsional strain, and its conclusion, that the margin of safety allowed was insufficient, seems to have been justified.

IT is fair to say that the investigation, although it resulted in the rejection of the architect's appeal, cast no discredit on him. The District Surveyor and the Tribunal concurred in praising warmly the work in general, and the question in regard to the stairs was simply a difference of opinion between two experts, carried to other experts for decision. The District Surveyor, Mr. Crow, in particular, showed not only thorough knowledge and excellent judgment in the matter, but a courtesy to his brother-architect which deserves commendation. Although he believed, on theoretical grounds, that the stairs, which were four and one-half feet wide, were unsafe, he went with the architect to see similar stairs, built in another district; and it was not until they had both found in these open joints between the steps and the landings that he gave notice that in

the new building he should require the outer ends of the steps to be supported.

ONE of the most unprovoked and malicious strikes of recent years has been in progress in Boston this week, but is now thought to be settled and declared "off." The source of the trouble is to be found simply in a demand made, some weeks ago, upon a large transportation company, which has many offices throughout the country, that it should refuse to accept for transportation goods made by non-union workmen. The officers of the transportation company replied that, while in all other points they were ready to accept the terms of the teamsters' union, they could not comply with this demand, for the reason that they were under contract with shippers of merchandise all over the country to receive and transport goods offered them, and they could not refuse such goods without a violation of their contracts which would involve them in ruinous suits for damages. This explanation would seem satisfactory to reasonable persons, but the agitators chose to reject it, and declared a strike against the transportation company. This strike was a failure, the company easily finding new men to drive its teams, while the Boston police showed admirable efficiency in suppressing the attempts of the strikers to assault the new men. As might have been expected, the leaders of the demonstration saw at once how the newly constituted civic conferences and conciliation committees could be utilized to advertise them, and telegrams, signed with their distinguished names, and addressed to Senator Hanna and other prominent persons, were duly communicated to the newspapers. The Secretary of the conciliation committee even came to Boston, but, after examining the affair, discreetly went back again.

AFTER a week or two of silent preparation, the "strike committee" executed its next manœuvre, which consisted in ordering all freight-handlers, railway-men, teamsters and others to refuse to unload, handle or touch any merchandise brought or offered to them by the offending transportation company. As was undoubtedly expected, the railway freight-handlers who first obeyed the order were immediately discharged, and a general strike of all teamsters and freight-handlers was ordered, to compel the railway-companies to reinstate them. It is fair to the employés of the railways to say that they obeyed the order to strike unwillingly and reluctantly, but the terrors which the union despots are enabled, mainly through the cowardly truckling of politicians, to hold over workingmen prevailed over the natural loyalty of railway servants to their road, and the strike soon affected all the railroad freight-yards in the city. The President of one of the roads gave his men three days to return to work or be discharged, and had the satisfaction of seeing them come back rapidly, and it is probable that the railways suffered very little by the demonstration; but, as is usual in such cases, and as was undoubtedly foreseen, multitudes of innocent and peaceable people were put to annoyance and expense. As the drivers of coal-wagons joined the strike, little or no coal could be delivered, and some small manufactories, to say nothing of the elevators in some buildings, had to suspend operation. In the same way, as materials could not be delivered, building-operations in the city were stopped, and many mechanics were thrown out of work. As is well known, building workmen in Boston never strike, their differences with their employers, when they have any, being settled by a committee of arbitration, so that their enforced participation in a contest in which they have not the smallest concern was particularly vexatious. That the strike must ultimately fail was evident, not only on account of the preposterous nature of the demand on which it was based, but because of the ease with which new men could be found to take up the simple and well-paid duties of freight-handling; and it may be hoped that the people of Boston, who are not so easily deluded in regard to labor matters as they were a decade ago, will take the opportunity to record emphatically their opinion of the desperate attempts which labor agitators have been making for the past two or three years, to shut out from all markets, and from all lines of transportation, merchandise not bearing the union stamp; that is, to reduce all American industry to slavery under the meanest, most cruel and most corrupt tyrants that ever cursed mankind.

A COMPOSITOR'S unfortunate blunder in our last issue must have given the impression that, like Tennyson's brook, our publication of "*The Georgian Period*" was to "go on forever." We will try to correct this impression by declaring that the Part that was published last week is the first Part of the third and final Volume, not, as was printed, "the first Part of five Volumes."

WE suppose that it must be the same Alexandre Sandier, well-known and beloved of many New York architects of the elder generation, who is now at the head of the national porcelain manufactory of Sèvres, and his friends in this country will be interested to hear of the porcelain tower which he proposes to erect in the park of Saint-Cloud, on the site of the "Lantern of Diogenes," which stood in the park until the destruction of the palace by the Germans in 1871. The tower is to be twenty-six feet in diameter and about one hundred and fifty feet high, and is to be entirely covered with decorated porcelain, representing the legends of the Forest of Saint-Cloud, with borders and ornaments taken from the animal and vegetable life of the region. The general ground color is to be white, or nearly so, the decorations being in their natural tints. Those who know M. Sandier's reputation as an artist will be impatient to see this remarkable work completed; but, as thirty thousand pieces of porcelain will be required, and the furnaces of the manufactory can contain only a limited number, it will be at least five years before the materials will be ready. In 1907, however, the Director hopes to be able to begin the work of construction, and the neighborhood of Paris will then be enriched with what is sure to be one of the most beautiful, as well as one of the most curious, of modern monuments.

IT is not impossible that this new undertaking, coming so soon after the extensive use of decorated earthenware in the front of the large Palace of Fine-Arts in 1900, indicates a renewed movement in France toward the use of colored materials in architecture which is of great significance. Since Garnier's well-studied, but rather timid attempt at polychromy with colored marbles in the front of the Opéra, little use has been made of color as an architectural resource in France, except in connection with restaurants or theatres. The polychromatic treatment of the latter has not, as a rule, been very successful, and the decision of the architects of so monumental a building as the large Fine-Art Palace to introduce a frieze in colored porcelain as a background for the capitals of their colonnade was received by the profession with many misgivings. The result, however, amply justified the innovation, and there was, perhaps, no architectural detail in the Exposition so interesting, as a suggestion of possibilities in the way of heightening and extending architectural expression, as the soft, pinkish band of decoration behind the upper portion of the colonnade, so little detached in color from the general tone of the wall that many people never noticed it until it was pointed out to them, yet giving a relief to the beautiful shafts and capitals, and, particularly at a distance, a certain mysterious charm to the effect of the colonnade, which must have struck all architects as affording a promise of new and lovely effects for artists capable of dealing with them. This frieze, we believe, came from the Muller manufactory, and if the Sèvres porcelain is as successfully applied to architecture, which M. Sandier's skill renders more than probable, the architects of the next decade will have a new field open to them.

THE Sixth International Congress of Workingmen's Dwellings will be held in Düsseldorf, beginning June 15, 1902, and continuing five days. The subjects to be considered are the influence of value of land, cost of construction and taxes upon rents; mutual assistance among those in need of dwellings, in the form of coöperative building societies and similar associations; and the effects of the intervention of the public authority in promoting the construction of such dwellings. The members of the Congress will make excursions to the great Krupp Colony, at Essen; to the houses of the Aders fund, and the Society for Savings, at Düsseldorf; and to similar groups at Munich, Cologne and Runscheid. The Secretary of the Committee of Organization, to whom communications should be addressed, is Professor Dr. H. Albrecht, Gross-Lichterfelde, Schillerstrasse, 11, Berlin. The subscription is ten marks, which should be sent to the Kasse A, Deutsche Bank, Manerstrasse, 29-32, Berlin, West. Inquiries in regard to accommodations in Düsseldorf during the time of the Congress may be addressed to Hugo Stangen, Unter den Linden, 39, Berlin, N. W. It is provided, very thoughtfully, that workingmen who are directors or inspectors in any workingmen's building society of general interest, if their application is made to the Secretary before June 15, may be relieved from payment of the subscription.

NOTES ON IRON AND STEEL CONSTRUCTION.[1] — V.

IN designing plate-girders there are several dimensions that must be decided by careful calculations, and there are likewise one or two details which must be carefully observed and analyzed. The span of the girder is fixed by the plan of the building, and to a certain extent the depth is likewise limited by the elevations. The depth of a plate-girder, however, should never be less than one-twentieth of the span, and when it is absolutely necessary to make the depth less than the minimum of one-twentieth, the deflection of the girder under the load should be figured, and if it is found excessive, the unit fibre-stress should be diminished by increasing the flange-area.

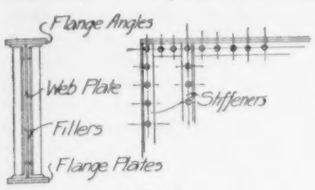


Fig. 25.

The structural features of a plate-girder are the upper and lower flanges, or chords, as they would be called if the web were built up of structural members instead of a solid plate, and the web-plate, all of which is clearly designated in Figure 25. The flanges are essentially the members that resist the bending-stress, while the web-plate is the member that resists the shear due to the loads, and thus transmits the stress from the top and lower flanges. Since the web-plate is responsible for the shear, and as economical consideration in the manufacture of the plate-girder prohibits making this member of different thicknesses of plates throughout its length, the plate must be proportioned for the maximum shearing-stress. The maximum shearing-stress in any simple beam is always at the points of support, or abutments, and is, consequently, equal to the greatest reaction at the ends of the girder; the greatest reaction being the vertical shearing-force acting through the web-plate, it is necessary to obtain enough metal in the section of the plate to resist the shearing-force to which it is subjected. The width

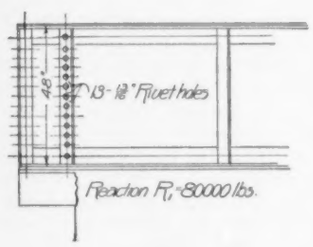


Fig. 26.

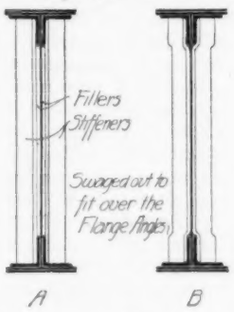


Fig. 27.

of the web-plate having been assumed, it is necessary, in order to obtain its net sectional area, to deduct all of the rivet-holes in a straight line through the end of the plate. The net sectional area cannot be found directly because the thickness is, as yet, undetermined, but the net depth may readily be determined by deducting from the width of the web-plate the product of the diameter of the rivet-holes by the number in the straight line. If this net depth is then multiplied by the safe unit shearing-stress of structural steel, usually taken at 12,000 pounds, the strength of the web-plate, if made 1 inch in thickness, is obtained. When this result is divided into the amount of the greatest reaction, or greatest vertical shear, the thickness of the web-plate required for the particular case will be determined. This can be readily stated in simple formula as follows: $t = \frac{R}{D - (d\,n)\,s}$, in which t equals the thickness of the web-plate to be determined, D equals the depth of the web-plate in inches, d equals the diameter of the rivet-holes, n the number of holes in a straight line, while s equals the safe unit shearing-stress of the metal, usually taken at 12,000 pounds, and R equals the greatest reaction, or the greatest vertical shear upon the girder. The results of this formula can, however, only be used when the required thickness is found to be at least $\frac{5}{16}$ inch, for thinner plates than this have been found, in time, to wear oval at the rivet-holes, and be subjected to buckling, which it was impossible to avoid.

Example. — The details of construction at the end of a plate-girder are shown in Figure 26, and it is desired to find the thickness of the web-plate.

Solution. — From the formula as previously given

$$t = \frac{R}{D - (d\,n)\,s}$$

and in this case D equals 48 inches, $d\,n$ (equals $\frac{13}{16}'' \times 13$) equals 10.56, s, as shown, equals 12,000, and R, as seen from the figure, amounts to 80,000 pounds. By substituting these values in the formula, $t = \frac{80{,}000}{(48 - 10.56) \times 12{,}000} = .18$ inch, or the theoretical thickness of the web-plate. This dimension being less than $\frac{5}{16}$ inch, the web-plate, for practical reasons before mentioned, must be made the minimum allowable thickness. The web-plate, owing to its extreme thinness and great width, is liable to cripple and buckle under the vertical loads which it supports, and it is, consequently, necessary to stiffen the plate by riveting at intervals angles which are usually placed back to back, one on each side of the plate. There are two methods commonly employed of constructing this detail, and they are shown in Figure 27. The construction shown at A is the one usually employed, as it requires less labor, though more material, than the design shown at B. It is possible to do without stiffeners when the depth of the girder is small by thickening the web-plate, but this is seldom done, and angle stiffeners must be provided if the shearing-stress exceeds the value of s as given in the following formula: —

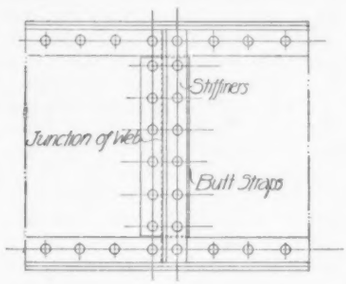


Fig. 28.

$$s = \frac{12{,}000}{1 + \frac{h^2}{3{,}000\,t^2}}$$

in which h represents the depth of the web between the flanges of the girder and t the thickness of the web-plate, both of these values being expressed in inches. Some engineers limit the use of stiffeners to plate-girders having a greater exposed depth of web-plate between the flange-angles than eighty times the thickness of the plate. In all cases, whether stiffeners are used throughout the length of the girder or not, they must be provided at the ends of the girders over the supports, and at all points on the girder where a concentrated load is located.

The stiffeners at the end of a plate-girder are always proportioned so that they will have sufficient sectional area to resist the amount of the reaction, and the usual safe allowable unit compressive strength upon such stiffeners is taken at 12,000 pounds. There is no theoretical rule by which the stiffeners can be spaced throughout the length of the girder, though it is the usual practice to place them at a distance apart equal to the depth of the girder where such a distance does not exceed 5 feet; where the girder is deeper than this the stiffeners are placed at this maximum distance. The sizes of the stiffeners are not usually determined by any calculation, and in actual practice they are made usually of $2\frac{1}{2}'' \times 2\frac{1}{2}'' \times \frac{5}{16}''$ angles for girders up to 4 feet in depth, and of $3'' \times 3'' \times \frac{3}{8}''$ angle for girders over 4 and less than 5 feet in depth. They could be proportioned to resist the vertical shear at the point at which they occur; this is not customary, however, and the sizes of stiffeners mentioned above are commonly employed.

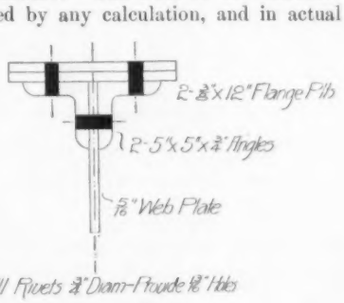


Fig. 29.

Where plate-girders are of great length and considerable depth it is impossible to obtain the web-plate in one piece, and, consequently, it is often necessary to splice this plate. Such a splice should always occur, where possible, at the point of least shear, which in a girder uniformly loaded is at the centre, and

[1] Continued from No. 1366, page 69.

it is usual in making such a splice to place the joint adjacent to a set of stiffeners. The two pieces of the web-plate abut against each other, and are reinforced on each side by butt-straps. These are usually made the same thickness as the flange-angles, and take the place of a filler underneath the stiffeners, as shown in the detail, Figure 28. Where the splice is made at the point of no shear, only sufficient rivets are required to hold the plates in position, and it is usual to pitch the rivets at the maximum allowable pitch, which is 6 inches.

In proportioning plate-girders to withstand transverse stress, it is not the practice to figure the moment-of-inertia, or section modulus of the section, for a plate-girder is regarded as a Pratt truss, the web-plate taking the place of the diagonal and vertical members common in such a truss. Considered in this way, the resisting-moment of a plate-girder is equal to the moment of the tensile or compressive strength of the upper and lower flanges, one about the other; that is, under any transverse stress the lower flange tends to tear apart with a leverage around the upper flange, as a centre-of-moment. From this the resisting-moment of a plate-girder, or M_1, equals $S\,D$, in which S equals the allowable tensile stress of the metal, and D the depth of the plate-girder. The value of S in the formula is equal to $A\,s$ or the allowable unit stress by the net area of the flange, while D is the theoretical depth of the girder taken from the centres-of-gravity of the flanges. The allowable unit stress, or s, adopted for plate-girders used in building-construction is 15,000 pounds, though, where economy demands it, 18,000 pounds may be used with safety. In figuring the area of the flange, or A, many engineers consider only the combined net section of the flange-plates and angles, while others, less conservative, consider one-sixth of the depth of the web-plate in calculating the area of the flange. In either case the area of the rivet-holes cut by a vertical plane must be deducted from the gross sectional area in order to obtain the net sectional area.

While, theoretically, the depth of the girder is the distance from centres-of-gravity of the flanges, in practice the depth of the girder is commonly taken as the width of the web-plate, or approximately the distance from back to back of flange-angles. Since M_1 equals $S\,D_1$ as previously explained, M_1 equals $s\,A\,D$ also, or by transposition, $A = \frac{M_1}{s\,D}$; that is, the net sectional area required in a plate-girder is equal to the resisting-moment at that place divided by the product of the allowable unit stress by the depth of the girder, and in applying the formula the resisting-moment required, or M_1, is obtained in foot-pounds, and the depth of the girder, or D, is designated in feet.

Example. — Determine the net sectional area for a girder having a span of 50 feet, and a depth of 4 feet, when loaded with a uniformly distributed load of 4,000 pounds per lineal foot.

Solution. — W equals $4{,}000 \times 50 = 200{,}000$, M equals $\frac{W\,L}{8}$, or $\frac{200{,}000 \times 50}{8} = 1{,}250{,}000$ foot-pounds. M equals M_1, and A equals $\frac{M_1}{s\,D}$, or $1{,}250{,}000 \div 15{,}000 \times 4 = 20.8$ square inches, which is the required flange-area. In order to provide for this area, assume the flange section shown in Figure 29, which consists of two $\frac{3}{8}'' \times 12''$ flange-plates, two $5'' \times 5'' \times \frac{3}{4}''$ angles, and one-sixth of the $\frac{5}{16}''$ web-plate.

The combined gross area of these rolled shapes is as follows: —

Two $\frac{3}{8}'' \times 12''$ flange-plates	9. square inches.
Two $5'' \times 5'' \times \frac{3}{4}''$ angles	14.22 square inches.
One-sixth of web-plate	2.5 square inches.
Total gross area	25.72 square inches.

It will be observed from the figure that 3 rivet-holes must be deducted, and their area, provided $\frac{3}{4}$-inch rivets are used, and the hole is made $\frac{1}{16}$ inch larger than the rivet, is as follows: —

Two rivets in vertical position $= 2 \times 1\frac{3}{16} \times 1\frac{1}{4}$	$= 2.436$
One rivet in horizontal position $= 1\frac{3}{16} \times 1\frac{3}{16}$	$= 1.469$
	3.905

Deducting the area of the 3 rivet-holes from the gross sectional area of the flange gives $25.72 - 3.905 = 21.815$, or the area of the assumed section. This is slightly greater than the required flange-area, and, consequently, the section can be adopted for the girder n question.

The single web-plate girder shown in Figure 27 is not always used, for in some cases the double web, or box, girder, as designated in Figure 30, is adopted. The principal disadvantage in the use of the single-web girder is on account of its lack of lateral rigidity, and its liability to failure from sidewise deflection. The box-girder should always be used where there is a great length of span, and where wide flange-plates are necessary in order to obtain lateral stiffness; the great disadvantage

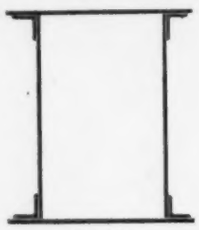


Fig. 30.

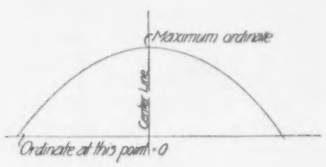


Fig. 31.

in the use of box-girders consists in the fact that they are difficult of access for inspection and painting. Where a single-web girder is not held in position laterally, the width of the flange-plate should be equal, at least, to one-twentieth of the span. If such a proportion does not exist, the sectional area of the upper flange should be increased by the following formula: —

$$A_1 = A\left(1 + \frac{l^2}{5{,}000}\right)$$

in which A_1 equals the necessary gross sectional-area in inches required in the top flange of the girder; A equals the gross area in inches required in the top flange of the girder when the vertical moment alone is considered, and l equals the quotient obtained by dividing the length of the span in inches by the width of the flange, likewise in inches.

As previously explained, when a beam is uniformly loaded, the bending-moment upon it may be represented by a parabola, and as the flange-area is directly proportional to the bending-moment, the flange-area throughout the girder may likewise be represented by a parabolic curve. By observing this curve, as shown in Figure 31, it will be noted that it has an altitude or ordinate of zero at the abutments, and rises to a flat curve at the centre of its length where the greatest ordinate occurs. This would show that practically a flange-area of zero is needed at the abutments, while at the centre of the span the maximum area is required. Where, therefore, a girder is proportioned with a number of flange-plates, it is usual to extend these flange-plates only so far on each side of the centre of the girder as may be required. The greater the number of flange-plates, the more nearly may theoretical economy in the design of the girder be obtained. It is customary to extend the flange-angles throughout the girder, and where the girder lacks lateral support, it is the best practice to carry the first flange-plate the entire length of the girder, as well as the flange-angles. The remaining flange-plates may be reduced to within 2 feet of their theoretical length, a foot being necessary on each end over and above the theoretical length in order to provide for riveting. The theoretical length for the flange-plates on any girder supported at both ends and uniformly loaded may be

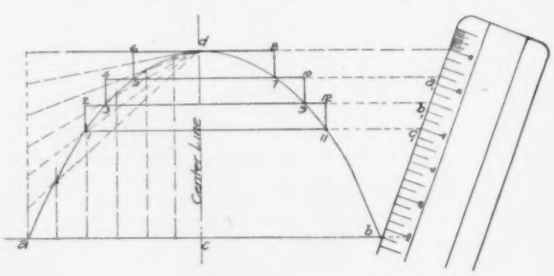


Fig. 32.

determined by means of the diagram shown in Figure 32. In this figure lay off the line $a\,b$ equal by any scale to the span of the girder, and make the length of the centre ordinate $c\,d$ equal by any scale to the maximum net flange-area, divide the ordinate at a into any number of equal parts and likewise the distance $a\,c$ into the same number of parts, extend lines from the divisions upon the vertical line at a, radiating to the point d,

and draw from the divisions upon the horizontal line $a\,c$ the ordinates as shown; through the points at which the ordinates intersect the corresponding radial lines draw the curve which is a parabola as designated. By laying any scale diagonally across the drawing, as shown, so that the number of divisions upon the scale equals the number of square inches in the combined net flange-area, the areas of the several flange plates and angles may be laid out; these areas are obtained by counting off a number of divisions as at a', b', c', equal, respectively, to the number of square inches in the net area of the several flange-plates. Extend from the points a', b' and c' the horizontal lines designated, and from the point of intersection of these horizontal lines with the parabola draw the heavy vertical lines to the next horizontal line above, as shown at 1–2, 3–4, 5–6, 7–8, 9–10, etc.; then the length of the several flange-plates may be found by scaling the distances 6–8, 4–10, 2–12, with the same scale to which the span of the girder $a\,b$ was laid off. These lengths are the theoretical lengths of the flange-plates, and a foot at each end must be added in order to determine the length of flange-plate that should be used. Where it is not desirable to use the graphical method there is a formula by which the length of the flange-plates may be calculated where the girder is uniformly loaded. This formula is

$$L_1 = L\sqrt{\frac{A_1}{A}}$$

in which L_1 equals the theoretical length in feet of the flange-plate in question; L equals the length of the girder from centre to centre of supports, in feet; A_1 equals the net sectional area of all of the flange-plates counting from the outside of the girder and including the flange-plate in question, while A equals the total net flange-area.

Example. — Assume that a plate-girder having a span of 60 feet has a net flange-area equal to 40 square inches, and that the flange is composed of two flange-angles and four $12'' \times \frac{5}{8}''$ plates, each of which has a net flange-area equal to 6.25 square inches; determine the length of the four flange-plates.

Solution. — Since a girder having such a narrow flange lacks lateral stiffness, the flange-plate next to the flange-angles should extend the full length of the girder; by substituting in the formula, the length of the outside plate is equal to L_1, or

$$60\sqrt{\frac{6.25}{40}} = 23.40 \text{ feet};$$

the length of the flange-plate next to the outside one is equal to L_1, or

$$60\sqrt{\frac{12.50}{40}} = 33.60 \text{ feet},$$

while the third flange-plate is equal to L_1, or

$$60\sqrt{\frac{18.75}{40}} = 40.80 \text{ feet}.$$

These lengths, as previously explained, are the theoretical lengths, and must be increased at least 1 foot at each end.

Where a girder is loaded with a number of concentrated loads the flange-plates can also be stopped off and a saving in

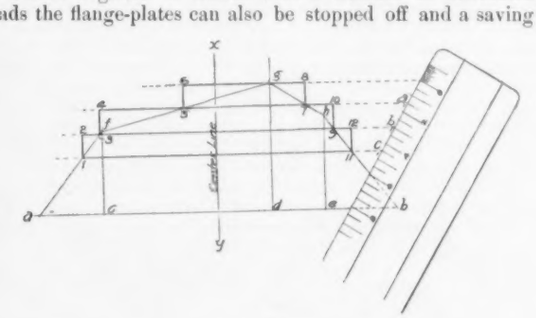


Fig. 33.

metal and riveting thus instituted. The method commonly employed is shown in Figure 33 and consists of laying off the line $a\,b$ equal by any scale to the span of the girder and locating accurately upon it the concentrated loads, which may be of any number and amount, as shown at c, d and e; upon ordinates located at these points the amount of either the bending-moment or the net flange-area required at the several locations must be laid off, as at c-f, d-g, e-h; then by connecting a-f, f-g, g-h and h-b, a true diagrammatic representation of the bending-moment is obtained; draw the indefinite horizontal line through g and lay off with the scale as shown, and as previously explained in connection with the uniformly distributed load, the net sectional area of the flange plates and angles; these divisions are made as at a_1, b_1 and d_1, and the horizontal lines extended from these

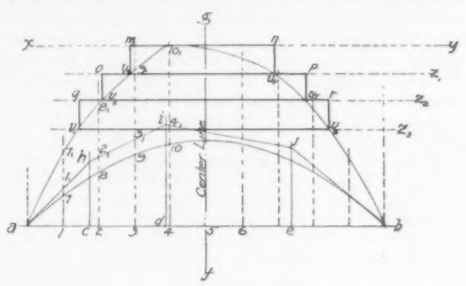


Fig. 34.

points as shown. Where these lines intersect the funicular polygon $a\,f\,g\,h\,b$, as it is called, draw the vertical lines as shown at 1–2, 3–4, 5–6, 7–8, 9–10, 11–12, and by measuring 6–8, 4–10, etc., the theoretical length of the several flange-plates is determined, the measurement being made as before, with the same scale to which $a\,b$ was laid off. These flange-plates must be located properly with reference to the centre line $x\,y$, and the location may be determined by scaling from the diagram.

The graphical method for determining the length of flange-plates where the girder supports both a uniformly distributed load and several concentrated loads is designated in Figure 34. This diagram is a combination of the methods employed for the uniformly distributed load and the concentrated load. It consists of laying off to scale the span of the girder as a, b, and upon the centre line $g\,f$ marking to scale a distance equal to the bending-moment caused, or the flange-area required, by the uniformly distributed load only; through the points a and b, a parabola is drawn as described in connection with Figure 35; from the points c, d and e, which are the locations of the three concentrated loads upon the girder, ordinates are erected, and upon these ordinates the bending-moments, or flange-area, due to the concentrated loads alone are laid off, as at c-h, d-i and $e\,j$, using the same scale as in measuring the parabola. The diagrammatic figure consists of the parabola representing the uniformly distributed load, and the funicular polygon representing the concentrated loads; both together express the distribution of the bending-moments upon the girder. The combined effect of the two loads is obtained by dividing the span $a\,b$ into any number of equal parts and from these divisions, as 1, 2, 3, 4, 5, etc., extending the vertical ordinates, lay off the distances 1–7, 2–8, 3–9, 4–10, etc., from the points 1_1, 2_1, 3_1, 4_1, respectively, obtaining the measurements 1–7_1, 2–8_1, 3–9_1, 4–10_1, etc.; from these points draw the irregular curve as designated; through the highest ordinate of this curve draw the horizontal line x-y, and by placing the scale as designated lay off the divisions representing the net sectional area of the flange-angles, as explained in connection with Figures 36 and 37, and as shown in this diagram at z_1, z_2, z_3; from these points draw the several horizontal lines designated, and where they intersect the irregular curve, as at v_1, v_2, v_3, v_4, v_5, v_6, etc., draw the short heavy vertical lines upwards as designated; then by measuring the distances m-n, o-p, q-r, etc., the theoretical length of the several flange-plates may be determined. As explained in connection with the diagram for determining the theoretical length of the flange-plates where the girder supports several concentrated loads, the flange-plates in this case must be placed with relation to the centre line as called for by the diagram.

The several principles and usual methods for proportioning and designing plate-girders have been given; the rivet-spacing, however, is important, and will be explained in the next article, in connection with the strength of rivets. M. M. Sloan.

[To be continued.]

Ruskin Memorial in Poets' Corner. — The work of the committee formed for the purpose of placing a memorial of John Ruskin in Westminster Abbey has been accomplished. The memorial takes the form of a bronze medallion. The sculptor was the late Mr. Onslow Ford, R. A. The place assigned to the memorial by the Dean and Chapter is in Poets' Corner, immediately above the bust of Sir Walter Scott. — *Exchange.*

MODERN OFFICE-BUILDINGS.[1]

SOME of Mr. Bolton's remarks indicate that he recognizes, what other keen observers have already recognized, that the high steel-skeleton office or hotel building is not simply an architectural problem, but a problem in which the architectural treatment is but one of the coördinate parts of the design.

The architectural treatment is not and should not be considered as the controlling factor — though it generally is — in the design of this modern embodiment of concentrated facilities for administrative business or communistic living.

In buildings of this character a very little thought will be required to perceive that the architectural design is not the controlling factor, and therefore should not be allowed to fix the conditions, to which all other parts of the design should conform. To illustrate this idea: The architectural design can be changed, almost an infinite number of times, without the mechanical-engineering essentials being changed at all, and with only such changes in the structural design as may be required locally by the changed architectural disposition of the materials composing the walls, etc. If the truth of this proposition is recognized, it is evident that no extended argument is required to show that the present method is wrong, in putting in the hands of the individual designer of the façade the final decision on all matters of design; and the truth of this proposition can be admitted and acted upon without in any way belittling or making light of the architectural problems, which are of great importance, and should only be entrusted to broad minds and capable hands. For as long as appearances continue to be a factor in human affairs, and as long as beauty of line and form appeal to our sense of intellectual fitness, just so long will the architectural problem be worthy of the most careful consideration.

The recognition of the fact that the architectural part of high-building construction is not the governing factor gives no excuse for slighting this part of the design, but it should be also recognized that the architectural problem, in its specific relation to high-building construction, can be worked out to a rational solution only when the limits which bound it are defined by the factors which actually should control the design as a whole. High steel-skeleton building-construction may be defined as an engineering work with an architectural accompaniment.

It is perhaps already evident that in order that each of the elements entering into the design as a whole be given proper recognition, and its due value as a factor, the chief designer should be a man capable of judiciously passing upon the claims of each of these elements to precedence. Experience has shown that the man who owes his training exclusively to the art-school and its influences cannot or will not consider the engineering side of the problem. The men who spell their art with a capital A deplore science, as a necessary evil, which disturbs their mental repose; and, if not as an evil, then as a bore, which interferes with and places practical obstacles in the way of their flights of fancy. Mathematics and science are looked upon by men of this type as matters of formulas, rule-of-thumb and mechanical routine, a matter to be learned out of a book, which can be mastered in about the same way that one learns to recite a piece of verse or prose, or as one learns a trade. Men of this type do not think that imagination enters into the study or practice of science, and particularly the science of engineering, and look upon themselves as the only rightful possessors of the wings of flight or imagination. They have no conception of the trained imagination required to comprehend the higher mathematics, nor of the sustained and logical derivatives of the product of thought, obtained from mathematical investigation. Having no appreciation of the intellectual basis of engineering, it is not to be wondered at that they treat the demands of science with scant consideration. It is, therefore, hardly to be expected that the graduate of the art-school only, whose whole mental training has been given up to the study alone of the relative values in the play of light and shadow, the balancing of solids and openings, the study of the appearances of things, or the art of seeming, can be qualified to pass upon problems which deal with realities or things as they are. In works of magnitude, under the guidance of such minds, the structural and mechanical parts of the design are often sacrificed to supposed requirements of art; and the result is an incongruous composite of the total elements of the design, and, necessarily, a failure.

Another type of mind which is unsuited for the position of designer-in-chief is that type which has no appreciation of art and beauty, and has no other "measures" than those of "economy" and "efficiency." This type, while useful in a large way as a counterweight and a standard of comparison, often misses the best solution, or possibly never attains it, in a problem of this character, by the narrow view it takes of the things with which it is not familiar, and, by reason of one-sided training, is not fitted to be an intelligent and impartial judge of the various elements entering into a composite and complex design.

The designer best qualified for this important position of designer-in-chief is evidently one who has a knowledge of the broad essentials and limitations of the various parts of the design, the judicial temperament permitting the balancing of an advantage against a disadvantage, a breadth of mind enabling a comprehensive view to be taken, coupled with courage and decision; with all these qualifications, governed by a broad and catholic love of beauty in all its manifestations — not only of beauty of form and line, which is evident and can readily be comprehended, but of the more subtle beauty of science and its results.

This combination of qualities is not an impossible one, or, in fact, necessarily a very rare one. It is realized, perhaps, more definitely in the scholarly engineer, whose acquaintanceship with facts and laws governing matter is accompanied with a broad knowledge of the fundamental requirements of art, and to him must eventually come the position of master builder.

If the composite design of one of these engineering-architectural problems is analyzed, it will be seen to admit of two main subdivisions:

(1) The engineering design.
(2) The architectural design.

The engineering design can be subdivided into its structural and mechanical components: The structural component, comprising the foundations and superstructure, including the stability of the structure against vibration, wind forces, fire and corrosion. Under the head of structural design should also come the planning of the floor areas and spaces, with all their subdivisions. Usually, the floor-plan is laid out by the architectural designer without reference to the structural design, and this results frequently in poor and expensive construction. The consideration of the floor-plans and the structural design should take place at the same time — and preferably by the same mind, or, at any rate, by minds working in harmony, for the floor-plan and the structural arrangement are truly dependent on each other. The arrangement of the floor is not strictly an architectural problem, though it is frequently considered as such; it is also a scientific one, or one in which all the factors can be determined and balanced one against the other, and an equation arrived at figuratively, from which a result can be obtained which rests upon determined facts, and not upon mere whim, prejudice or predilection. Daylight has a certain carrying and distributing power which does, or should, determine some of the dimensions of rooms.

Transportation facilities and convenience of access determine the local arrangement of the office-areas around the elevators, or, rather, the location of the elevators with reference to the "centre-of-gravity" of the office-areas. The economic location of lavatory-fixtures requires the grouping of these fixtures around common drainage and water-supply centres, which in turn demand certain broad arrangements of lavatory rooms and fixtures, usually not difficult to comply with.

The lighting and heating systems require distributive local centres and sub-centres, which should bear certain relations to the groups of offices and sources of supply.

Not infrequently, the floor-plan is decided upon and then turned over to the structural designer with instructions that nothing can be changed. This results sometimes in the use of structural expedients which are expensive and structurally unsatisfactory, and which could have been avoided by an appreciation of the relative values of each of these matters. The consideration of the scheme, also, from one standpoint only often results in the sacrifice of the best arrangement of the mechanical equipment.

When the planning of the floors and the structural design is under discussion the fireproofing and rustproofing should also be considered. It is not an uncommon thing to find the fireproof covering cut away to get in a door or window frame, or some piping that has been overlooked or not considered when the planning was under consideration, and for this there is no excuse, unless haste in preparing the plans — due to no fault of the designer — is given.

Fireproofing is generally given but scant consideration, and rust-proofing little, if any, and for this neglect no adequate excuse can be given. The fireproofing is seldom considered as a part of the design, but is taken care of by general methods of allowances over the dimensions of the beams, girders and columns. The intelligent designing of fireproofing demands a knowledge of the weakening effects of heat on steelwork. The maximum strength of iron is at about 400 degrees Fahr., and there is a loss of strength of about 1,000 pounds per square inch of section for every increase of 100 degrees in temperature. A knowledge of the rate of transmission of heat through various substances and dead-air spaces, and a knowledge of the resistances of various materials to the action of fire and water, separately and alternately — a little knowledge of these various matters — will be sufficient to show the insufficiency of many of the present methods, and the inadequacy of many of the materials used for this purpose. Porous or semi-porous terra-cotta properly made and burned is probably the best material in use, but, as it is manufactured to-day, it is too thin, and the standard beam-coverings, with a thickness of only 1 inch over the lower flanges of the beams, are absurd, and the column-coverings and the methods of fastening them on the steelwork are but little better.

The question of rust-proofing is seldom considered, and is often entirely ignored. The rusting of iron is such a familiar fact that it is surprising how little attention is paid to it. Millions of dollars are being invested yearly in buildings the durability and stability of which are entirely dependent upon the iron framework, yet, beyond giving the metal-work a coat of paint, nothing is done. The fact that Portland-cement preserves iron from corrosion is now well known, and the chemistry behind this fact should be as well-known. Rust is caused by three factors working together, viz., water, an acid, and oxygen. If these three factors are not allowed to act coördinately, rusting cannot take place. Portland-cement, because it is a product

[1] A letter by William Copeland Furber, M. Am. Soc. C. E., read before the American Society of Civil Engineers, and published in the *Proceedings* of the Society.

of lime, furnishes a base which neutralizes any acid likely to be present under ordinary conditions, and therefore any water which may filter through it can do no harm. This fact is acted upon in the use of steel in the foundations of buildings below the water-line, but little use is made of the knowledge above the cellar-floor.

The mechanical component of the engineering design, comprising the steam-power plant for operating the elevators, the lighting, heating and ventilation systems, and the layout of each of these parts; the lighting-system, consisting of dynamos, distributive wiring and storage-battery; the heating-system, consisting of the distributive piping, etc., with the fans and ducts required to supply the heat and air under pressure, and to remove the foul air; the operating mechanism of the elevators; the water-supply for individual and general uses and fire-protection; the drainage-system, and the telephone and telegraph wire-systems; should all be considered and tentatively laid out before the final plans are decided upon.

The requirements of each of these subdivisions of the mechanical design require most careful study, and, as they are a vital part of the design as a whole, they should be laid out to accomplish the best possible results, and this arrangement adhered to as closely as is permissible with reference to other parts of the scheme. Most of the evils of crowded and unsatisfactory layouts of the mechanical equipments in high buildings are the result of lack of knowledge, on the part of the designer-in-chief, of the conditions of arrangement conducive to the best results. The fact that the equipment can be placed and operated in inconvenient and contracted spaces is also taken advantage of, and the mechanical equipment relegated to such spaces as can be devoted to no other purposes. When the amount of money required to maintain and operate this equipment, and its proportion to the total operating expenses of the building, are considered, no defence can be made of the inadequate facilities usually allowed for its installation.

In the distributive systems of the mechanical plant, the placing of pipes, conduits, etc., in the floors, walls and partitions is frequently not considered in the detail drawings, and is generally merely specified. This neglect sometimes leads to a great deal of trouble and often to the adoption of make-shift methods, which could have been avoided by due consideration being given to the details on the drawings.

The architectural design consists in the main of the treatment of the façade, usually according to, or with the details of, some historic style; the arrangement of the windows, and, in a secondary way, the architectural treatment of the offices. This internal treatment of offices can be said to be independent of the general architectural, structural and mechanical design, and therefore not a factor in the design of the whole, with which only this particular discussion deals.

The arcitectural part of the design can be changed according to the whim or predilection of the designer without materially affecting the other parts of the design. It is therefore evident that with this liberty goes great responsibility. If the design decided upon is one of a possible thousand, and the design is a poor one, the responsibility is proportional to the number of better ways of solving the problem.

A great mistake that many architectural designers make in treating the high skeleton building is in attempting to treat it as a masonry structure. This lack of perception of the limitations of masonry construction leads them to many curious anomalies and absurd results, as, for instance, the placing of a Greek temple on top of a many-storied building, and the employment of brackets, consoles, modillions and other architectura details which once had some function, but which are now, in these buildings, wired or strapped upon an iron framework.

The high skeleton building is worthy of an architectural style consistent with its serious purposes and the dignity of its place in the modern business world, and this style should express the truth of its construction and its purposes, and should not make it masquerade in borrowed clothing, pretending to be a masonry structure, yet violating some of the fundamental principles of masonry construction. Architecture needs the stimulus of new truth and new conditions, and the skeleton building furnishes them.

A CONCRETE COURT-HOUSE.

THE Nassau County Court-house, which has just been completed, is one of the most important buildings ever constructed entirely of cement-concrete. The entire work was constructed under the Ransome system, which consists of reinforcing the concrete with cold-twisted steel bars of great strength, which are placed at proper points, both vertically and horizontally, in the concrete. The general dimensions of the building are 195′ x 95′, in the form of an inverted T. It is two stories in height, 36 feet from the ground to the roof, and the height to the apex of the dome is 65 feet. The general measurements of the court-room are 38′ x 50′ and 18 feet high to the ceiling. It is situated on the second floor, with two jury-rooms and a judge's room in the rear. The foundation-walls, floors, pillars, partitions and dome are of cement-concrete. The building is practically an immense rock, cut and dressed with architectural ornament on the outside and mined inside in the form of rooms. A building of this character represents a class of construction that is certainly ahead of anything known to the building world as regards its fireproof qualities. The records of the great fires of Chicago and Boston have given proof of an unquestionable nature that cement-concrete is as good as any fireproof building-material. The exterior of the new county-court is especially attractive. The concrete is finished in a very satisfactory manner; both smooth and rough surfaces are produced with perfect success. To give the concrete the appearance of rough-dressed stone, it is gone over with pneumatic tools, except on ornamental and fine-dressed work, where hand-chisel is used. The appearance is so perfect that the difference between natural stone and the concrete is hardly distinguishable. The lines representing the joints between stones are made by placing strips of moulding lightly nailed to the inner surface of the mould. They may be arranged in such manner as desired, and of any shape or size to suit requirements. The concrete is then filled into the moulds in the usual manner, and when it is sufficiently set the moulds are removed. This leaves the concrete marked off as if built up with stone. The ornamental work was made from plaster moulds, and each part has imbedded in it the bars of twisted steel, which not only serve to strengthen it, but also afford a means of securing the ornament to the wall in a most satisfactory way. The sharpness of the detail in ornamentation of the most elaborate design is a feature of the work on this building. The court-house is connected by a concrete tunnel with the jail, which was also built according to the Ransome system. — *Stone Trades Journal.*

ILLUSTRATIONS

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

CORRECTION: THE A. D. CLUB BUILDING.

WE regret sincerely that we were innocently the instrument of doing injustice to the author of this design. We have been advised since publication of our last issue that in the carrying out of his design Mr. Charles K. Cummings, of Boston, associated with himself for this work Mr. J. Harleston Parker, the now senior member of the firm, to whom the entire credit was mistakenly attributed. — EDS.

DESIGN FOR A PROPOSED CHURCH IN THE SUBURBS OF BOSTON, MASS. MESSRS. CRAM, GOODHUE & FERGUSON, ARCHITECTS, BOSTON, MASS.: TWO PLATES.

NORTHWEST VIEW OF THE HOUSE OF MRS. L. L. SWANN, STOCKBRIDGE, MASS. MR. ROBERT S. STEPHENSON, ARCHITECT, NEW YORK, N. Y.

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

THE BASSIN DU DRAGON, VERSAILLES, FRANCE; — HARDE DE CERFS, GARDEN OF THE LUXEMBOURG, PARIS, FRANCE. M. LE DUC, SCULPTOR.

[Additional illustrations in the International Edition.]

HOUSE OF MRS. L. L. SWANN, STOCKBRIDGE, MASS. MR. ROBERT S. STEPHENSON, ARCHITECT, NEW YORK, N. Y.

THE PHILLIPS CONGREGATIONAL CHURCH, EXETER, N. H. MESSRS. CRAM, GOODHUE & FERGUSON, ARCHITECTS, BOSTON, MASS.

EAST FRONT OF THE SAME CHURCH.

A DOORWAY OF THE GRAND PALAIS, PARIS, FRANCE. M. DEGLANE, ARCHITECT; — THE TUILERIES: ENTRANCE TO THE MINISTRY OF THE COLONIES.

VESTIBULE: CHÂTEAU DE CHANTILLY, FRANCE; — THE GRAND STAIRWAY: THE SORBONNE, PARIS, FRANCE. H. P. NÉNOT, ARCHITECT.

THE MAURITSHUIS, THE HAGUE, HOLLAND.

THE CHURCH OF S. GIUSTINA, PADUA, ITALY. [1532–49.] ANDREA RICCIO, ARCHITECT.

NOTES AND CLIPPINGS

THE GLASTONBURY THORN. — It is to be hoped that another Glastonbury thorn will be obtained to replace the missed one in South Kensington Gardens, for in the bustle of modern times it is pleasant to be occasionally reminded of the legends and beliefs of our forefathers.

By them it was held that Joseph of Arimathæa struck his travelling-staff at Wearyall Hill, near Glastonbury, where it immediately took root, and annually blossomed at Christmas. In the reign of Queen Elizabeth it had two trunks, but one was destroyed by a Puritan, the other being preserved for a time by a flying chip, which blinded the assailant. The remaining trunk was cut down by another Puritan in the reign of Charles I. Early in the nineteenth century a small flat stone, bearing the inscription of J. A., A. D. 31, was placed to mark the site where the tree grew. Of course, the initials stand for Joseph of Arimathæa, while the date is that traditionally ascribed to his visit. So great was the demand for relics from the Glastonbury thorn that before its destruction many trees had been grafted in the neighborhood. Not only was it noted for its miraculous blossoming; its sprigs and blossoms — about the size of a sixpence — were considered sovereign specifics for avoiding the evil eye, rooting out weeds from corn, and various other evils. Its fame spread beyond the seas, and down to the reign of Henry VIII the Bristol merchants exported these blossoms to different parts of the world. Crowds, too, annually visited Glastonbury down to recent times at Christmas to see the blossoming. A curious story is told in *The Gentleman's Magazine* for January, 1753. Confusion still existed concerning the old and new style, and a vast concourse of people assembled at Glastonbury to see the trees blossom on December 25. No blossoms came on that date, but on old Christmas Day they appeared as usual. — *London Chronicle.*

False Antiques in Europe. — Philip G. Hubert, Jr., narrating in the March *Century* "A Bavarian Bric-à-Brac Hunt," has this prefatory warning concerning the tricks of the dealers: "In the way of carved furniture, I am afraid that there are more fraudulent antiques than genuine in the Paris shops to-day. There is one dealer in particular who, when closely questioned as to the origin of certain Louis XV sideboards and tables he has for sale, will tell you they came from the Château of Chenonceaux, the famous little palace where the fair Diane de Poitiers once lived and loved; and in proof of it he will show you a bill of sale, duly stamped and authenticated, of a certain lot of furniture sold to him in 1863 from the château. Hundreds of persons, doubtless many Americans among them, have bought those Chenonceaux tables and buffets, and have seen that precious document, which, no doubt, is good so far as it goes. Unfortunately, according to a rival dealer, that bill of sale covered only two sideboards and three tables from Chenonceaux, notwithstanding which, Chenonceaux tables and chairs have been pouring forth from the little shop in a steady stream for the last twenty years — enough to freight an ocean steamship. The widow's cruse of oil was nothing to it. I do not doubt that if I were to order fifty Chenonceaux tables to-morrow, the proprietor of the shop would agree, with a twinkle of intelligence, to fill the order within a reasonable time. Some time ago the neighbors of a certain petty furniture-dealer in London complained of the constant pistol-shooting in the tradesman's back yard. Haled before a magistrate, the man testified that he was a reputable manufacturer of "antique" oak chests, and that it was necessary to fire bird-shot at his new chests in order to give them a worm-eaten appearance; which anecdote recalls to me that I once saw in the window of a bric-à brac shop in Strasburg this announcement: 'The Newest Things in Antiquities.'"

Empirical Way of prejudging the Effect of a Monument. — Some time ago the well-known French sculptor Bartholdi described in *La Nature* a simple method of ascertaining what dimensions of a proposed monument will produce the desired effect on a given site. A silhouette of the design is cut from cardboard, either a scale-drawing or preferably a photograph from a scale model furnishing a basis therefor. If this can be tinted so as to give the tone of the material to be used, so much the better. The silhouette is attached to one end of a piece of soft wire, which is wrapped loosely round a cane, umbrella, or other similar support, so that its position may be shifted back or forward at will. On the site of the monument, just alongside where the base will probably come, is placed a vertical measuring rod marked off into prominent divisions. The experimenter takes his position at a sufficient distance to secure a good general view, and brings up to the level of his eye the support carrying the silhouette, aiming as with a gun towards the site. By shifting the position of the silhouette along the support it may be determined after a while where it produces the best effect, considered as furnishing the illusion of the original structure. By there noting the correspondence in height between any given division of the small design — as, for instance, the top and bottom lines of the die — and the feet or yards on the measuring rod, a scale can be established. This scale applied to the drawing or model will show what the sizes of the executed work should be. — *Stone Trades Journal.*

Destruction of Rood-lofts. — The order of Edward for the taking down of roods applied, in the first instance, simply to the removal of the rood figures, *per se*, being afterwards erroneously concluded to extend to the rood-loft, or gallery of access to them. This gallery was formed on the upper beam of the screen, into which the joists of it, with the supporting timbers of the rood figures, were framed, and its either side was defended or fenced in by a parapet along its length, to secure safe passage across. It was this gallery, or passage, to, and as such connected and associated with, the objected-to rood figures that it was the object of the reformers of Elizabeth's time to do away with, as is very clearly and explicitly shown by her order. The indiscriminating ignorance and prejudice of the age, however, failed to distinguish between transposition, "transposed" being the word of the order, and destruction, as it had already done between reformation and abolition, and from the lack of a clear understanding or a wilful misconception of former orders, had both the rood-gallery and its figures pulled down, and were continuing to pull down, the entire upper portion of the screen, extending the demolition in some instances to the entire structure of it, leaving them as that at Southwold, and in a number of other cases, is now seen stripped to their naked framing and entirely denuded of their upper part. To this condition it was not the authorized intention to reduce them. Elizabeth's order clearly defines the extent to which they were to be altered and the mode in which they were to be finished and left after such alteration. The words are as follows: — "It is thus decreed and ordained that the rood-lofts" — roods had already been previously for the most part removed — "as yet, being at this day aforesaid, untransposed, shall be so altered that the upper part of the same with the soller" — an old term for an upper story — "be quite taken down unto the upper parts of the vautes" — vaulting — "and beam running in length over the said vautes, by putting some convenient crest upon the said beam towards the church"; that is to say, the rood-loft or gallery was to be taken down to the beam or cornice above the groined canopy or vault, and was there to be finished with a crest ornament or brattishing, the common mode of finishing such a cornice or termination. — *The Architect.*

An Old-time Organ. — In Clyde, N. Y., a Wayne County village, is the oldest church pipe-organ in the United States. Additional interest attaches to the instrument from the reason that it was the first whose pipes gave music for the worshippers in old Trinity, New York City. The organ is now occupying a place of repose and honor due to the dignity of old age in the chapel of St. John's Episcopal Church. It has had a somewhat remarkable career from the time it came to the New World as a royal gift to the day its place was taken in the country church by a rival of more modern make. The organ was installed in old Trinity as a mark of Queen Anne's special favor to the Englishmen who had made New Amsterdam into New York. The gift was received with the royal command that it should never be sold, but that when the parish could afford a better one it should be transferred to a church which had no organ. After many years the old instrument was set up in Trinity Church, Utica, where it was used for more than two decades. Still honoring the precept of Queen Anne, although times had changed and royal commands had little effect among the people of the new States, the organ was sent here in 1846, and from that date to 1884 it served St. John's Church. Once it had a narrow escape, for the church was burned, but the parishioners bent all their efforts toward saving the organ, and succeeded. When the new instrument was put in position in 1884, the old Queen Anne's gift was removed to the chapel, where for more than ten years its keys have not been touched, but the parishioners prize it highly. The ancient instrument is 8 feet in height, 7 feet in width and 4 feet in depth, with one set of keys and six stops. — *N. Y. Tribune.*

Electroplating Wooden Doors. — A process of covering wooden doors with sheet-metal by means of electrolysis is at present being experimented with at Bridgeport, Conn. The excellent fire-resisting qualities of a wooden door covered with tinplate have long been recognized, since the metal covering prevents the wood taking fire, while the use of wood for the framing avoids any risk of the warping of the door by heat, allowing flames to pass through, as has happened with doors built wholly of iron. A tinplate-covered door has, however, a poor appearance, and is therefore suitable only for workshops and warehouses. By depositing copper or bronze electrolytically, it is hoped to provide doors suitable for buildings of all kinds. The method followed is to place the carefully-finished wooden doors in a hot solution of fossil gum in linseed-oil. This completely closes the pores of the wood with an impervious varnish, so that on transferring the door to the electrolytic bath the solutions are not absorbed. On removal from the varnishing bath, the edges of the door are bound with sheet-copper fixed by cement, and the rest of the door is then covered with a conducting layer of bronze powder, after which the whole is placed in an electrolytic bath, and copper deposited over the whole surface. — *Building News.*

The Illinois Central planting Catalpa Trees. — John P. Brown of Connersville, Ind., Secretary of the International Society of Arboriculture, passed through this city recently on his way to New Orleans. Mr. Brown has been employed by the Illinois Central Railroad to inspect the lands owned by that system in Mississippi with a view to selecting an area suited to the cultivation of catalpa trees. The purpose of this experiment is to raise catalpa trees on some of the unimproved lands of the Company to be utilized in the shape of cross-ties, posts and lumber. The Company has authorized Brown to plant not less than 200,000 catalpa trees, and figures that, in the course of about fifteen years, it will have a most valuable forest, furnishing thousands of dollars' worth of cross-ties, lumber, and posts of various kinds. The experiment has been tried by a number of railroad-companies in the United States. The strongest claim for the catalpa tree is the greater durability of this wood, which is said to outlast anything else in the field. — *Boston Transcript.*

Street Nomenclature in East Boston. — "Monmouth" is a familiar word to the student of Revolutionary history, and this fact was called to Lieutenant-Governor Bates's attention by the writer. "You are evidently not acquainted with East Boston," he rejoined, and then said the early founders of the island city divided the town up into sections; the first section of streets is named after the notable battles of the Revolution; the second section, running at right angles, is named after the generals in the Revolution; the third section is named after the great English poets, with the addition of Homer; the fourth section is named after the great cities of Europe, while the fifth section is named after birds. — *Boston Herald.*

Cataloguing the Papal Art-treasures. — The Pope recently received a petition to encourage the project of making a catalogue of all art-treasures preserved in Italian churches and monasteries, to prevent their being secretly purchased and exported. — *Exchange.*

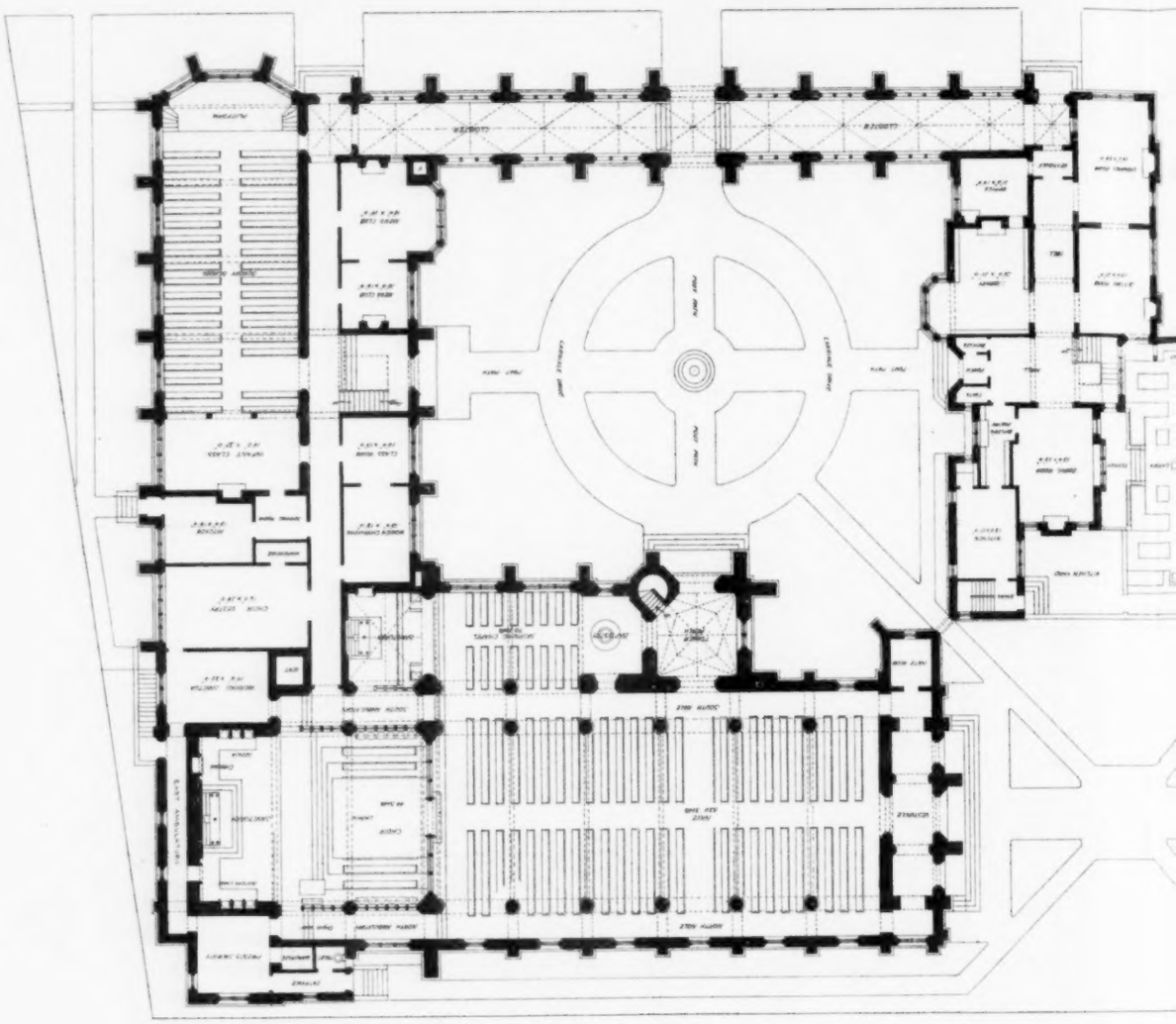
S. J. Parkhill & Co., Printers, Boston, U. S. A.

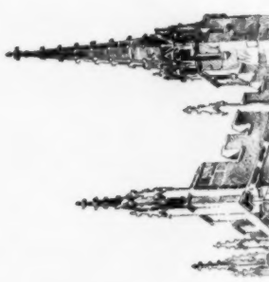
A PROPOSED CHURCH IN THE S

CRAM, GOODHUE & FERG

N THE SUBURBS OF BOSTON, MASS.
E & FERGUSON, ARCHITECTS.

HELIOTYPE PRINTING CO., BOSTON





A PROPOSED CHURCH IN THE SUBURBS OF BOSTON, MASS.

CRAM, GOODHUE & FERGUSON, ARCHITECTS.

The American Architect
March 15, 1902.
No. 1268

NORTHWEST VIEW: HOUSE OF MRS
ROBERT S. STEPH

OF MRS. L. L. SWANN, STOCKBRIDGE, MASS.
S. STEPHENSON, ARCHITECT.

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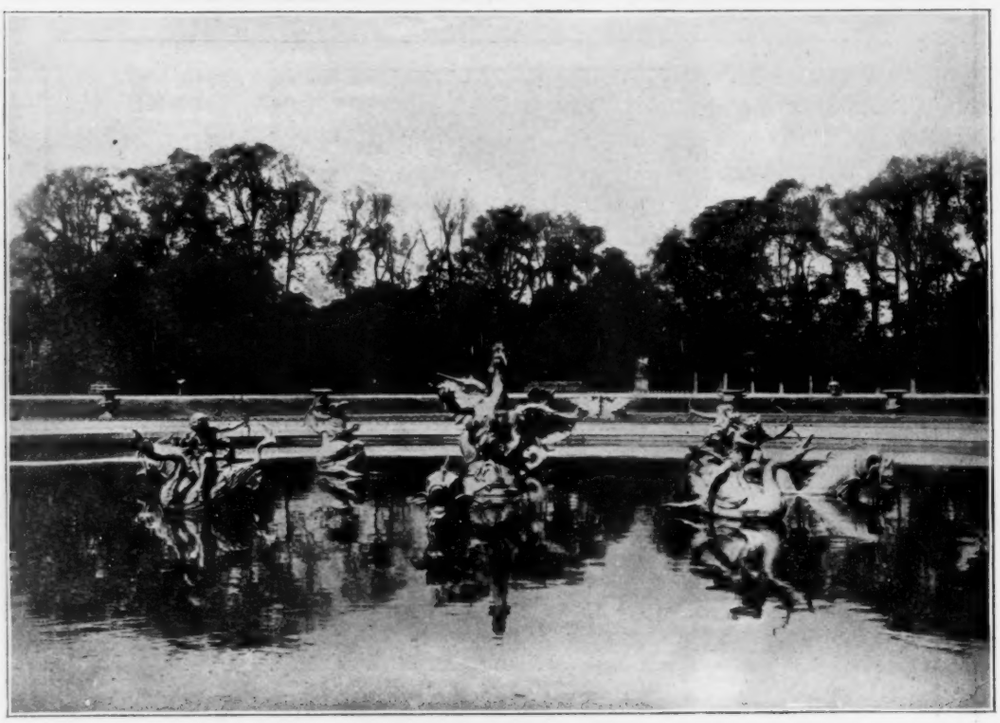
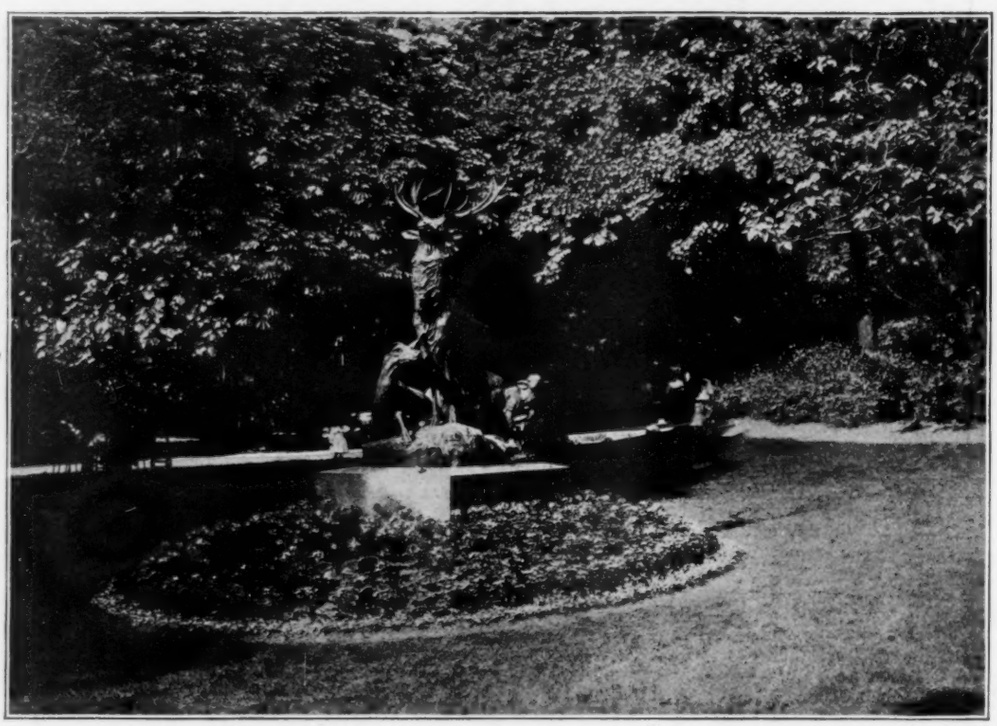


THE BASSIN DU DRAGON, VERSAILLES, FRANCE.



HARDE DE CERFS, GARDEN OF THE LUXEMBOURG, PARIS.

Le Duc, Sculptor.

The American Architect and Building News

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GAY & PROCTOR, architects.
Boston, March 1, 1902.

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DRAUGHTSMAN. — Wanted, an architectural draughtsman. Must be first-class for general working drawings and full-sized details. Answer, stating qualifications and salary desired. Richards, McCarty & Bulford, Columbus, O. 1368

WANTED.

DRAUGHTSMAN. — Wanted, first-class architectural draughtsman and specification writer. Call, if possible, at office of Ernest Flagg, architect, 35 Wall St., N. Y. City. t.f.

BUILDING INTELLIGENCE.

(Reported for the American Architect and Building News.)

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

ADVANCE RUMORS.

Ada, Minn. — Omeyer & Thori, St. Paul, have been selected to prepare plans for the Norman Co. courthouse; probable cost, $30,000.

Alexandria, S. D. — The citizens of Hanson Co. have voted to erect a $28,000 court-house.

Amsterdam, N. Y. — It is announced that W. and J. Sloane, of New York, are interested in the Shuttleworths Bros.' Company recently incorporated with a capital of $100,000, to manufacture carpets and rugs. A mill capable of employing 250 hands is to be erected at once.

Anniston, Ala. — C. W. Carlton & Co. have drawn plans for a five-story hotel to be erected on the corner of Noble and 12th Sts. Wm. H. Zinn is interested.

Austin, Tex. — Plans have been prepared by Dodson & Scott, of Waco, for a veterinary laboratory for the Agriculture and Mechanical College, to cost $30,000.

Ballard, Wash. — The Ætna Locomotive & Machine Co. will erect a plant to manufacture locomotives, freight-cars and mill machinery; cost, $150,000.

Baltimore, Md. — The Maryland Women's Quarter Club has been incorporated. Its purpose is to receive donations of money and property of any description for the erection and maintenance of a hospital for consumptives.

Boston, Mass. — Plans for a six-story building, to be erected for the Perkins Institution for the Blind at Day and Perkins Sts., Jamaica Plain, have been prepared by D. E. Reardon, an inmate of the institution.

Brockton, Mass. — A high school will be erected on Warren Ave. and High St., to cost $42,000.

Brooklyn, N. Y. — Plans have been drawn by A. N. Allen, Windsor Arcade, for a four-story brick dwelling to be erected on Clinton Ave. for W. H. Nichols, Jr.

Bryn Athyn, Pa. — F. L. Hoover & Son, Philadelphia, have plans from William Hunter for a new station at this place, which is on the Newtown branch of the Philadelphia & Reading Railway. It will be one-story high, of frame, with a slate roof, and will measure 20′ x 30′.

Cambridge, Mass. — Permit has been granted Mrs. Charlotte A. Ricker for the erection of a three-family frame dwelling on Windsor, corner of Market St., Ward 2; cost, $6,000.

Camden, Pa. — The Fries Breslin Co., Philadelphia, are to make a big addition to their manufacturing plant at Atlantic and Federal Aves. The plans for the work have not yet been made public.

Canandaigua, N. Y. — A $100,000 hospital will be given by Mrs. F. F. Thompson.

Chicago, Ill. — Holabird & Roche have drawn plans for a ten-story building to be erected on Michigan Ave. for Eldridge M. Fowler; cost, $200,000.

Plans have been drawn by Handy & Cady, 172 Washington St., for an apartment-house to be erected by P. J. Ryan, on Garfield Boulevard and S. Park Ave., to cost $80,000.

Chippewa Falls, Wis. — Andrew Carnegie offers this city $20,000 for a library building.

Cleveland, O. — Steffens, Searles & Hirsh, 131 Euclid Ave., have completed plans for an apartment-house to be erected on Wade Park and Marcy Aves., by Fisher & McKenzie, to cost $125,000.

BUILDING INTELLIGENCE.

(*Advance Rumors Continued.*)

Columbus, Ga. — Plans have been adopted for a $25,000 edifice for St. Paul's Methodist Church.

Des Moines, Ia. — Westminster Presbyterian Church plans the construction of a church at 12th and Forest Aves. of pressed brick or stone, to cost $20,000.

Duluth, Minn. — John Panton, of Panton & White, has had plans prepared by Kees & Colburn, architects, of Minneapolis, for a modern residence and barn to cost about $20,000.

Epping, N. H. — Mrs. Sarah F. Wright has sold her farm, situated in the North River district, to John Gerry, of Massachusetts. It is understood that on the farm, which contains 200 acres of very valuable land, will be established the largest brick plant in New Hampshire; the report being that the land will be transferred to the Epping Brick Co. Operations will be begun in April, or as early as the condition of the land will permit.

Evanston, Ill. — Plans have been completed by John D. Atchison, 90 Washington St., Chicago, for an apartment-house costing $100,000 to be erected on Hinman Ave. and Lee St., for the United Safety Investment Co.

Gloversville, N. Y. — An offer of $50,000 has been made this city by Andrew Carnegie for the erection of a library building.

Goshen, Ind. — Patton & Miller, 115 Monroe St., Chicago, Ill., have drawn plans for a $40,000 high school for this place.

Grand Rapids, Mich. — N. G. Robinson, Houseman Block, has drawn plans for a business block for the Herpelshimer Dry Goods Co.; cost, $60,000.

Harrisburg, Pa. — Builder L. H. Focht, of Philadelphia, has plans for Alexander Smith, of Reading, for the new station to be built here for the Philadelphia & Reading Railway.

The Phillip Arms Co., Philadelphia, have plans from C. Harris Lloyd, of this city, for a new public school-house to be built at 6th and Woodbine Sts. It will be known as the Old Camp Curtin School. The approximate cost will be $100,000.

Homestead, Pa. — J. B. Knoth is stated to have completed plans for a three-story brick bank and office building, to be erected on 8th Ave. for the Monongahela Trust Co., to cost about $40,000.

Jackson, Miss. — St. Andrew's parish will erect a new edifice on Capitol and West Sts., to cost about $30,000.

Jackson, Tenn. — Messrs. Brown & Brown, 126 N. Spruce St., Nashville, have in preparation plans for remodelling the Southern Hotel; cost, $10,000. Plans will be ready March 15th. The same architects have also under way plans for a frame Colonial dwelling for W. B. Moss, to cost $3,500, and for a brick veneer dwelling for Walter Brown, to cost $4,500.

Louisville, Ky. — Plans have been prepared by Clarke & Loomis, 502 Fourth St., for a wholesale house to be built on Main St., at a cost of $100,000 for Peaslee & Gaulbert Co.

Mangum, Okla. Ter. — The Greer County Commissioners have decided to erect a $50,000 court-house.

Minneapolis, Minn. — Maj. C. B. Heffelfinger has decided to have built a 40 by 70 foot addition to the North Star Boot & Shoe Factory. It will be of the same height as the main building, seven stories, and will cost about $30,000.

The Brooks-Griffith Elevator Co. will rebuild their grain elevator, which was destroyed by fire, in southeast Minneapolis. The new building will be of fireproof construction and will cost $100,000.

John Wunder has begun work on the superstructure for the Lindley building at 1508 Hennepin Ave. Kees & Colburn, architects; cost, $15,000.

Nacogdoches, Tex. — The County Commissioners will erect a $20,000 jail.

Newport, Vt. — Supervising Architect James Knox Taylor has sent to the Builders' Exchange plans providing for the erection of a new post-office, custom-house and court-house building at this place.

New York, N. Y. — Augustus N. Allen, Windsor Arcade, has prepared plans for a six-story private

BUILDING INTELLIGENCE.

(Advance Rumors Continued.)

dwelling, with limestone front, 25′ x 90′, to be erected at 33 E. 39th St.

Henry Ives Cobb, 1 Wall St., has drawn plans for a twenty-story brick and stone office-building to be erected at 36, 38, 40, 42 Broadway, for a syndicate represented by S. H. G. Stewart, 115 Broadway.

A press report states that Warren & Warren have sold for E. G. Scott, 36 W. 20th St., a four-story and basement brownstone dwelling-house to Henry Schuyler & Co. The buyers will build a fourteen-story office-building on the premises. The front of the building will be of white marble.

It is stated that the Metropolitan Life Insurance Co. has loaned to the Seaboard Realty Co. $600,000 on the property situated at the corner of Amsterdam Ave. and 70th St. A twelve-story brick apartment-hotel is to be erected.

The Senate Cities Committee has reported favorably the bill which provides that municipal club-houses for boys shall be established in each of the boroughs of the city of New York, and that the sum of $10,000 be appropriated for each club-house in each borough, without amendment.

W. E. Finn has sold to John W. Stevens Building Co., 682 Broadway, an old three-story building, on a plot 29′ x 130′. A ten-story store and loft building will be built on the site. The building on the premises is a landmark of the city. It was the home of Philip Hone, when he was mayor of the city.

J. Romaine Brown & Co. have sold for L. G. Quinlan to the Metropolitan Life Insurance Co. 18 E. 24th St., a three-story brick dwelling-house, on a lot 20′ x 98′ 9″. The premises will be included in the site on which a new wing of the Metropolitan Life Building will soon be built.

The New York Ophthalmic and Aural Institute has bought a plot 100′ 5″ x 150′ at the corner of 64th St. and Central Park West from the Century Realty Co. A new home for the institution, it is said, will be built on the site. It is also reported that Dr. Herman Knapp, surgeon to the hospital, was the real buyer of the plot, and that he bought it as a gift for the hospital, which he founded in 1869. This report could not be confirmed however.

North Tonawanda, N. Y. — Geo. F. Rand is stated to have prepared plans for a $50,000 edifice to be erected by the Central Church of Christ.

Norwich, Conn. — The Uncas Paper Co. has plans in preparation for an enlargement of its plant by the construction of three storehouses and a boiler-house.

Oil City, Pa. — Charles W. Bolton & Co., of Philadelphia, have won the architectural competition for the designing of the proposed Carnegie library building at this place. It will be a two-story fireproof structure of brick, stone and terra-cotta, 60′ x 90′, and will be in the French Renaissance style. Cost of the work will be about $40,000.

Philadelphia, Pa. — Architect E. Wilson Allen has drawn plans for a large operation of dwellings at Broad St. and Erie Ave., for Louis Klibe; for 94 dwellings at Wayne Junction for William F. Morris, and 82 at Mount Airy for William T. B. Roberts.

Duhring, Okie & Ziegler have plans for an addition to the parish house of the Church of the Crucifixion on Bainbridge St., above 8th. It will be a four-story brick building, 18′ x 75′, and will be equipped with a gymnasium, dressing-rooms, game and reading rooms.

It is reported that an apartment-house will be built on the site of the old Brill mansion, at the corner of 35th St. and Powelton Ave., which has recently been purchased by Frederick A. Poth. A short time ago Mr. Poth purchased from Mrs. Ella D. Smith the adjoining property at 3615 Hamilton St. An eleven-story apartment-house will occupy the two sites, and will be one of the finest buildings of its kind in West Philadelphia.

Architects Cope & Stewardson have awarded to Stacy Reeves & Son the contract for the erection of the magnificent new medical laboratories for the University of Pennsylvania. The dimensions are 190′ x 340′, and the contract price for the work is $600,000.

BUILDING INTELLIGENCE.

(Advance Rumors Continued.)

Builder John R. Wiggins has been awarded the contract for the erection of the Philadelphia & Reading Railway, Y. M. C. A. Building, at Lehigh and Kensington Aves. It will be a three-story brick building measuring 50′ x 65′, and will be surrounded by spacious porches. In the basement will be bowling-alleys, a swimming-pool and a lunch-room: on the first floor the offices, library and committee rooms; on the second 14 bed-rooms, and on the third an auditorium and lecture hall. The total cost of the work will be $25,000.

It is reported that J. D. Clark, builder, will erect 172 dwellings in West Philadelphia on Hobart and Wanamaker Sts., and on 58th and 59th Sts., above Arch. They will be two-story brick structures with porches.

The Roxford Knitting Co. proposes to erect a plant for the manufacture of Balbriggan underwear. The main building will be six stories, 60′ x 200′. A dye house and engine and boiler house will constitute a one-story structure, 30′ x 170′. The entire plant will cost $150,000.

Pittsburgh, Pa. — Henry Phipps has purchased a site on the corner of 5th St. and Duquesne Way for the erection of a Mills Hotel. The building will be of brick, eight stories high, 100′ x 100′, and cost $80,000.

It is reported that the Baltimore & Ohio Railway Co. has taken steps to erect a new $400,000 station on the present site, corner of Smithfield St. and Monongahela Ave. It will be seven stories high, of brick and stone, 100 feet square. The old station will be moved northward a hundred feet and used for freight offices. The freight-house will be doubled in size and some terminal betterment made.

Pottsville, Pa. — The M. E. Society is reported to have decided to erect an $80,000 church.

Providence, R. I. — The Consolidated Mineral Water Co. has plans figured for a $25,000 bottling factory, of brick, two stories, 50′ x 100′.

Racine, Wis. — The Mitchell & Lewis Co. has plans for an addition to the wagon factory to cost $100,000.

Richmond, Va. — Muhlenburg Bros., of Reading, Pa., and Noland & Baskerville, of Richmond, are stated to have been selected by the Chesterfield Apartment-house Co. to prepare plans for a seven-story apartment-house to be erected on Shafer and Franklin Sts., to cost about $150,000.

Sauk Center, Minn. — St. Paul's German Catholic Society will erect a church, 50′ x 125′, to cost $20,000.

Scranton, Pa. — William Steele & Sons, Philadelphia, have plans for a large printery to be built for the International Correspondence Schools. It will be a three-story and basement building, of stone and brick, and will measure 150′ x 166′. W. Scott Collins is the architect.

Sharon, Pa. — Contract has been awarded George Kratt, of Findlay, O., for erecting the club building which Frank H. Buhl will present to the city; contract price reported to be about $150,000.

Spokane, Wash. — L. L. Rand and J. K. Dow have completed plans for a Masonic Temple in this city. Cost, $40,000 to $50,000.

Bishop Wells (Episcopalian) has secured a site and it is understood, will arrange for the erection of a mission building at Stevens St. and Front Ave.; cost, $30,000.

Springfield, Ill. — S. J. Hanes, Farmers' Bank Building, has prepared plans for a $40,000 building to be erected at Adams and 6th Sts., and occupied by the Farmers' National Bank.

Springfield, Mass. — Ellsworth & Kirkpatrick, of Holyoke, have prepared plans for a six-story business building to be erected on Dwight St. for Elisha Morgan, to cost about $25,000.

St. Paul, Minn. — McKibben, Driscoll & Dorsey contemplate the erection of a large store on Broadway and 5th St. which will cost in the neighborhood of $100,000. The structure will be fireproof, and will be of the best modern equipment throughout.

The chief engineer of the Omaha Ry. Co. has drawn plans for a brick and stone freight depot to be erected on the new tracks on the west side; cost, $20,000.

Titusville, Pa. — Jackson, Rosencrans & Canfield, 160 Fifth Ave., New York City, have drawn plans for the Benson Memorial Library to be erected here by R. D. Benson, Vice-president Water Oil Co., 12 Broadway, New York City. It will be of brick and terra-cotta construction, and cost in the neighborhood of $20,000.

Toledo, O. — The Depenthal Trunk Co. is to erect a warehouse on Morris and Hill Sts., to cost about $30,000. Architect, A. B. Sturgis, Spitzer Building.

West Hoboken, N. J. — Andrew Carnegie has offered $25,000 for the erection of a library building here.

Winchester, Va. — The plans of Frye & Chesterman, of Lynchburg, have been accepted by the Building Committee of the Farmers' & Merchants' National Bank, for a three-story brick building, to cost $30,000.

Worcester, Mass. — A five-story brick addition of large dimensions is to be made to the factory of the Graton & Knight Mfg. Co., at an expense of $150,000.

A three and one-half story addition, 142 feet long, will be made to Odd Fellows' Home. Barker & Nourse, architects. Cost, $20,000.

A. C. Higgins contemplates the erection of 2 or 3 apartment-houses on Grafton St. Plans have not yet been prepared.

A three-story frame structure, 42′ x 70′, will be erected for St. Joseph's Industrial School; cost, $15,000.

Rev. James B. Brady, pastor of Grace Church, is to buy property on the West Side, and a large chapel will be erected for the convenience of West Siders.

ALTERATIONS AND ADDITIONS.

New York, N. Y. — *Fifth Ave., No.* 473, alteration of dwell. to store & loft building; $15,000; a., Lionel Moses, 156 Fifth Ave.; lessees, Schultz, Dowling & Butler, 431 Fifth Ave.

BUILDING INTELLIGENCE.

APARTMENT-HOUSES.

New York, N. Y.—*Central Park West*, cor. 102d St., ten-st'y bk. & st. flat, 100′ 11″ x 105′ 3″, gravel roof; $350,000: o., Philip Braender, 47 W. 125th St.; a., Fred'k C. Browne, 143 W. 125th St.

E. Fourteenth St., Nos. 226-238, 4 six-st'y bk. flats & stores, 46′ x 90′; $180,000; o., Benjamin and Henry Nieberg, 133 Crosby St.; a., Sass & Smallheiser, 23 Park Row.

Eighteenth St., nr. 3d Ave., six-st'y bk. & st. apart., 42′ x 92′; $30,000; o. & b., Mishkind & Feinberg, 83 E. 7th St.; a., Sass & Smallheiser, 23 Park Row.

CHURCHES.

Calumet, Mich.—Two-st'y st. church, 56′ x 118′, steam; $25,000; o., Croatian Society; a., C. E. Nystrom, Laurium.

EDUCATIONAL.

New York, N. Y.—*Madison Ave.*, cor. 130th St., four-st'y bk. & st. school, 48′ x 110′; $100,000; o., R. C. Church of All Saints, 47 E. 129th St.; a., Wm. W. Renwick, 39 W. 27th St.

FACTORIES.

New York, N. Y.—*W. Fourth St., No.* 186, seven-st'y bk. & st. factory & stores, 20′ 6″ x 97′ 3″ x 93′ 8″, asphalt roof; $25,000; o., Michael Hallanan, 196 W. 4th St.; a., John Ph. Voelker, 979 Third Ave.

HOTELS.

New York, N. Y.—*Forty-fourth St.*, nr. 6th Ave., twelve-st'y bk. & st. hotel, 71′ 10″ x 92′, tile roof; $600,000; o., Puritan Realty Co., 51 Wall St.; a., Goldwin Starrett, 51 Wall St.

Sioux City, Ia.—Three-st'y & base. bk. hotel, 54′ x 150′; $20,000; o., J. J. Lessenich; a., G. W. Burkhead.

HOUSES.

Boston, Mass.—*Ash'and St.*, nr. Brown Ave., Ward 23, two-st'y fr. dwell., 38′ x 50′, shingle roof, furnace; $5,000; o., Rose A. Coughlan, Ashland St.; a., Thayer & Bowser; b., T. P. Wills.

Mill St., No. 121, Ward 24, 3 three-st'y bk. & st. dwells., 22′ x 55′, comp. roofs, hot water; $21,000; o., a. & b., A. Piotti, 38 Olney St.

Newcastle Road, Nos. 34-36, Ward 25, two-st'y fr. dwell., 28′ x 46′, shingle roof, furnace; $6,500; o., Helen McDaniel, 11 Mountford St.; a., G. E. Parsons.

Brooklyn, N. Y.—*Rogers Ave.*, nr. Erasmus St., three-st'y bk. stores & dwell., 27′ x 40′; $6,500; o., J. & W. Sieviers, Erasmus St. & Rogers Ave.; a., B. Driesler, 1432 Flatbush Ave.

Duluth, Minn.—Two-st'y bk. dwell., slate roof. $20,000; o., John Panton; a., Kees & Colburn, Minneapolis.

Glen Cove, L. I., N. Y.—2½-st'y fr. dwell., 29′ x 40′; $8,000; o., B. H. Tobey, 133 Fifth Ave., New York City; a., See & Silkworth, 150 Nassau St., New York City.

Greenport, L. I., N. Y.—2½-st'y fr. dwell., 24′ x 50′; $5,000; o., G. H. Reeves; a., H. Alban Reeves, 105 E. 17th St., New York City.

Mountain Lake, Minn.—Two-st'y bk. dwell., 36′ x 56′, shingle roof, hot water; $6,000; o., David Ewert; a., H. C. Gerlach, Mankato.

New Rochelle, N. Y.—Two-st'y bk. dwell., 38′ x 40′; $7,000; o., W. T. Emmet; a., Snelling & Potter, 111 Fifth Ave.

New York, N. Y.—*Two Hundred and Thirty-sixth St.*, nr. Katonah Ave., two-st'y fr. dwell., 20′ x 55′; $7,500; o., Louis A. Schneider, 1046 E. 165th St.; a., Moore & Landsiedel, 148th St. & 3d Ave.

Bainbridge Ave., nr. 208st St., three-st'y fr. dwell., 22′ x 52′; $5,000; o., Mrs. Rosa Gundall on premises; a., F. D. Miller, 3852 Southern Boulevard.

Prospect Ave., cor. Westchester Ave., two-st'y bk. dwell. & store, 99′ 8″ x 99′ 8″; $20,000; o., H. L. Phillips, 149th St. & 3d Ave.; a., W. C. Dickerson, 3d Ave. & 149th St.

One Hundred and Seventy-sixth St., cor. Morris Ave., 7 three-st'y bk. & st. dwells., 19′ x 44′; $55,000; a., R. C. Bullard, 148th St., cor. 3d Ave.

Vyse St., nr. Home St., 4 three-st'y bk. dwells.,

BUILDING INTELLIGENCE.

(*Houses Continued.*)

18′ x 55′; $28,000; o., M. Leonard, 342 Willis Ave.; a., Cunningham & Bullard, 148th St. & 3d Ave.

Lind Ave., nr. 167th St., two-st'y fr. dwell., 22′ x 53′; $5,000; o., Annie A. Smith, 3 Mercher Ave.; a., Will A. O'Hea, 195 Woodycrest Ave.

One Hundredth St., nr. West End Ave., 5 four-st'y bk. & st. dwells., 15′ x 56′; $75,000; o., John Livingston, 134 E. 71st St.; a., G. F. Pelham, 503 Fifth Ave.

Fifth Ave., nr. 73d St., five-st'y & base. bk. & st. dwell., asphalt & tile roof; $56,000; o., Geo. H. Warren, Newport, R. I.; a., Warren, Wetmore & Morgan, 3 E. 33d St.

E. Fortieth St., Nos. 34-36, *E. Thirty-ninth St., No.* 35, 3 five-st'y bk. & st. dwells., two 25′ x 89′, one 25′ x 91′ 11″; $150,000; o., Walter Stabler, 674 Columbus Ave.; a., Chas. I. Berg, 571 Fifth Ave.

BUILDING INTELLIGENCE.

(*Houses Continued.*)

Loring Pl., 2½-st'y fr. cottage, 20′ x 61′; $5,000; o., S. Caplan; a., A. De Saldern, 130 Broadway.

W. Fortieth St., Nos. 236-38, three-st'y bk. & st. dwell. & store, 40′ x 80′; $20,000; o., J. Weber, 213 W. 42d St.; a., Welch, Smith & Provot, 11 E. 42d St.

Orange, Mass.—2½-st'y fr. dwell., 36′ x 112′; $20,000; o., J. W. Wheeler; a., Fuller & Delano, Worcester; c., J. G. Vandreul, Worcester.

Orange, N. J.—Two-st'y half-timber dwell., 40′ x 54′; o., Mr. Lamme; a., Ludlow & Valentine, 100 Broadway, New York City.

Worcester, Mass.—*Batcheler St.*, three-st'y fr. dwell., 28′ x 63′; $5,000; o., Mrs. M. Dillon; a., G. H. Clemence; c., Thos. D. Foley.

BUILDING INTELLIGENCE.

(*Houses Continued.*)

Baker St., 2½-st'y fr. dwell., 30′ x 63′; $5,500; o., J. G. Murdock; a., A. J. Harrington.

MERCANTILE BUILDINGS.

Worcester, Mass.—*Park St.*, five-st'y bk. block, 60′ x 125′; $65,000; o., Harrison S. Prentice; a., W. H. Harvey.

STABLES.

New York, N. Y.—*W. Sixty-third St.*, two-st'y & base. bk. & st. stable, 50′ x 100′; a., Ludlow & Valentine, 100 Broadway.

Railroad Ave., cor. Mechanic St., 1½-st'y fr. stable, 30′ x 50′; $3,000; o., Lorillard Refrigerator Co., 1168 Broadway; a., W. T. Mapes, De Milt Ave., Wakefield.

Twenty-ninth St., No. 217, three-st'y bk. stable & storage, 23′ x 96′, gravel roof; $15,000; o., James S. Maher, 328 W. 20th St.; a., John E. Kerby, 722 Tremont Ave. & 1432 Broadway; b., John Maher & Son, 122 W. 34th St.

Sixty-third St., nr. 8th Ave., two-st'y bk. stable, 50′ x 89′, asphalt & gravel roof; $20,000; o., Isidore Jackson, 31 Nassau St.; a., Ludlow & Valentine, 100 Broadway.

Sixty-fourth St., nr. Avenue A, two-st'y bk. & st. stable, 26′ x 53′, tin & slate roof; $8,000; o., N. Y. Medical College & Hospital, Avenue A, bet. 63d & 64th Sts.; a., Geo. E. Teets, 28 Washington Pl., East Orange, N. J.

Sixty-third St., Nos. 41-43, two-st'y bk. stable, 50′ x 89′; $20,000; o., I. Jackson, 31 Nassau St.; a., Ludlow & Valentine, 100 Broadway.

Philadelphia, Pa.—*Walnut St., rear No.* 1219, four-st'y bk. stable, 17′ x 50′; $5,000; o., F. G. Pepper; b., G. F. Payne & Co.

STORES.

New York, N. Y.—*Canal St., No.* 101, five-st'y bk. lofts & stores, 30′ x 45′; $10,000; o., Louis Rubenstein, 258 Canal St.; a., Max Muller, 3 Chambers St.

TENEMENT-HOUSES.

New York, N. Y.—*W. Eleventh St., Nos.* 322-324, six-st'y bk. tenement, 45′ x 59′ x 48′ x 60′; $32,000; o., Sahneidler & Bachrach, 31 Nassau St.; a., Oscar Lowinson, 39 Cortlandt St.

One Hundred and Third St., nr. Amsterdam Ave., six-st'y bk. & st. tenement, 80′ x 87′; $150,000; o., Charles and Joseph Paterno, 507 W. 112th St.; a., G. F. Pelham, 503 Fifth Ave.

Avenue D, Nos. 67-69, six-st'y bk. tenement & stores, 40′ x 69′ & 80′; $35,000; o., Max Kotzen, 52 Broadway; a., M. Bernstein, 111 Broadway.

Eighty-fifth St., nr. 3d Ave., six-st'y bk. & st. tenement, 48′ 10″ x 89′ 2″; $45,000; o., Nathan Silverson, 242 or 247 E. 71st St.; a., G. F. Pelham, 503 Fifth Ave.

One Hundred and Sixteenth St., nr. Lenox Ave., six-st'y bk. & st. tenement & stores, 87′ 11″ x 100′; $135,000; o., William Cumming, Jr., 121 Manhattan Ave.; a., G. F. Pelham, 503 Fifth Ave.

Perry St., Nos. 63 65, six-st'y bk. & st. tenement, 50′ x 82′; $40,000; o. & b., Sam'l Parnass, 257 Henry St.; a., G. F. Pelham, 503 Fifth Ave.

THEATRES AND HALLS.

New York, N. Y.—*Forty-fifth and Forty-sixth Sts.*, nr. 7th Ave., five-st'y bk. & st. theatre, 85′ 8″ x irregular, slate roof; $120,000; o., Daniel Frohman, Daly's Theatre; a., Herts & Tallant, 32 E. 28th St.

WAREHOUSES.

Brooklyn, N. Y.—*Pearl St.*, cor. Front St., six-st'y bk. warehouse, 100′ x 102′, gravel roof; $115,000; o., Jones Bros., Pearl & Water Sts.; a., E. N. Stone, 1364 Dean St.

President St., nr. 3d Ave., three-st'y bk. warehouse, 92′ x 120′, gravel roof; $30,000; o., Hildebrand Baking Co., 505 Carroll St.; a., C. Werner, 26 Court St.

Howard Ave., n e cor. Bainbridge St., 5 three-st'y bk. dwells., 20′ x 50′; $25,000; o., B. Levine, Jr., 8640 Twenty-first Ave.; a., W. B. Wills, 17 Troutman St.

Howard Ave., n w cor. Bainbridge St., 5 three-st'y bk. dwells., 20′ x 50′; $25,000; o., B. Levine, Jr., 8640 Twenty-first Ave.; a., W. B. Wills, 17 Troutman St.

Quincy St., nr. Lewis Ave., 4 three-st'y bk. dwells., 18′ 10″ x 50′; $25,000; o., F. Berlenbach, 838 Flushing Ave.; a., W. B. Wills, 17 Troutman.

MISCELLANEOUS.

Brooklyn, N. Y.—*Herkimer St.*, cor. Sackman St., two-st'y bk. telephone exchange, 48′ x 66′, terra-cotta roof, steam; $25,000; o., N. Y. & N. J. Tel. Co., 81 Willoughby St.; a., W. B. Claflin, 81 Willoughby St.

Cropsey Ave., nr. Bay 19th St., two-st'y & attic fr. summer nursery, 30′ x 64′, shingle roof; $5,000; o., N. Y. Children's Aid Society, 287 Fourth Ave.; a., A. E. Parfitt, 26 Court St.

PROPOSALS.

SCHOOL. [At Cygnet, O.]

Bids are wanted **March 27** for furnishing material and erecting a school in Cygnet Special School Dist. I. F. JUNE, Chmn. Bldg. Com., Bd. Educ. 1368

CITY-HALL. [At Houston, Tex.]

Bids will be received **March 24** for erecting a city-hall and market-house to cost $250,000. ARTHUR LIPPER, City Sec'y. 1368

BRIDGE. [At Buffalo, N. Y.]

Sealed proposals will be received by the Commissioner of Public Works for the construction of a bascule bridge in S. Michigan St., over the City Ship Canal, **until March 27, 1902.** Information furnished on application. C. M. MORSE, Deputy Engineer Commissioner. 1368

PORTLAND CEMENT, ETC. [At Fort Monroe, Va.]

U. S. Engineer Office, Custom-house, Norfolk, Va. Sealed proposals for furnishing and delivering Portland cement, broken stone, yellow pine lumber, steel bolts, I and channel beams, iron doors and bolts, iron castings, soil and wrought-iron pipe and fittings, hollow brick and partition tile at Fort Monroe, Va., will be received here **until March 24, 1902.** Information on application. 1368

SCHOOL. [At Damascus, O.]

Bids are wanted **March 24** for erecting a school. W. A. KETTLAN, Clk. 1368

POOR HOUSE. [At Burlington, Ia.]

Bids are wanted **March 25** for erecting Co. Poor House at the Co. Farm. C. MATHES, Chmn. Bd. Superv. M. P. SHARTS, Co. Aud. 1368

SCHOOL. [At Shawano, Wis.]

The undersigned hereby gives notice that sealed proposals for the erection of a school-building to be erected at Shawano, Wis., including all labor and material, will be received by D. B. Gorham, clerk of the School Board, **until the 25th day of March, A. D. 1902.** All bids must be in strict accordance with the plans and specifications prepared by Chandler & Park, architects, of Racine, Wis., and may be seen at the office of D. B. Gorham, clerk, and at the architects' offices at Racine, Wis. (Signed) D. B. GORHAM, clerk. Shawano, Wis., February 26, 1902. 1368

PROPOSALS.

REMODELLING HALL. [At Baltimore, Md.]

Bids are wanted **March 30** for remodelling Friendship Hall, 125 E. Montgomery St. Address, EDW. E. MITCHELL, Pres. Bd., 1226 S. Charles St. 1369

COURT-HOUSE AND JAIL. [At Shelburne, N. S.]

Bids are wanted **April 2** for erecting a court-house and jail. GEO. A. COX, Chmn. Const. Com. 1369

BUSINESS BLOCK. [At Dawson, Minn.]

Sealed proposals will be received **until March 29th,** by Mr. H. H. Onstad, of Dawson, Minn., for the erection of a brick business block at Dawson. Plans and specifications may be seen at the store of H. H. Onstad, Dawson, Minn., or at the office of the *Improvement Bulletin*, Minneapolis. H. H. ONSTAD. 1369

SCHOOL. [At Pocahontas, Ia.]

The Independent School District of Pocahontas, Ia., will receive bids **until March 31, 1902,** for the erection of an eight-room brick school-house. Plans and specifications may be seen at secretary's office in Pocahontas, Ia., or at office of Jas. S. Cox, architect, Estherville, Ia., after March 15. A. L. SCHULTZ, secretary, Pocahontas, Ia. 1369

AGRICULTURAL BUILDING. [At Durham, N. H.]

Bids are now being taken and no date set for closing on proposed three story brick and stone agricultural building, 58′ x 110′, with ell, to be erected at a cost of $30,000 at Durham, N. H., from plans furnished by J. E. Randlett, of 72 North St., Concord, N. H. Architect has charge. 1369

BARRACK BUILDINGS AND POWER-HOUSE. [For the Mountain Branch, N. H. D. V. S.]

OFFICE OF THE NATIONAL HOME FOR DISABLED VOLUNTEER SOLDIERS,
Rooms 932-4 New York Life Building, 346 Broadway,
New York City, March 12th, 1902.

Sealed proposals will be received at this office **until 12 M. Wednesday, the 16th day of April, 1902,** for furnishing materials, labor, etc., for the construction of barrack buildings and power-house at the Mountain Branch of the National Home for D. V. S., near Johnson City, Tenn. Plans and specifications can be seen, necessary information obtained, and blank forms for proposals procured on application to this office or to the architect, J. H. Freedlander, 244 Fifth Ave., New York City, or at the office of the Superintendent of Construction near the site of the work. The Home reserves the right to reject any or all bids and to waive defects. MOSES HARRIS, General Treasurer, N. H. D. V. S. Approved: M. T. McMAHON, President Board of Managers, N. H. D. V. S. 1372

Treasury Department, Office of the Supervising Architect, Washington, D. C., March 10, 1902. Sealed proposals will be received at this office until 2 o'clock P. M. on the 15th day of April, 1902, and then opened, for furnishing the low pressure, steam heating apparatus, etc., complete in place for the U. S. Post-office at Hot Springs, Arkansas, in accordance with the drawings and specification, copies of which may be had at this office or at the office of the Superintendent at Hot Springs, Arkansas, at the discretion of the Supervising Architect. JAMES KNOX TAYLOR, Supervising Architect. 1369

Treasury Department, Office of the Supervising Architect, Washington, D. C., March 10, 1902. Sealed proposals will be received at this office until 2 o'clock

PROPOSALS.

P. M. on the 12th day of April, 1902, and then opened for furnishing the heating apparatus complete in place for the U. S. Post-office building at Oskaloosa, Iowa, in accordance with the drawings and specification, copies of which may be had at this office or at the office of the Superintendent at Oskaloosa, Iowa, at the discretion of the Supervising Architect. JAMES KNOX TAYLOR, Supervising Architect. 1369

SEWER. [At Sac City, Ia.]

The incorporated city of Sac City, Ia., will receive sealed bids **until March 24th, 1902**, for the construction of a sanitary sewer. Plans, specifications and proposal blanks are on file with Dr. T. B. Mansfield, chairman sewer committee, Sac City, Ia., and the Engineer, A. Marston, Ames, Ia. 1368

COURT-HOUSE. [At Parker, S. D.]

Bids are wanted **March 25** for erecting a courthouse; also same date for plumbing and heating the same. Address, the Co. Aud. 1368

ADDITION TO WAREHOUSE. [At Hayward Boarding School, Wis.]

Department of the Interior, Office of Indian Affairs, Washington, D. C. Sealed proposals addressed to the Commissioner of Indian Affairs, Washington, D. C., will be received at this office **until March 25, 1902**, for furnishing and delivering the necessary materials and labor to construct and complete at the Hayward Boarding School, Wis., an addition to the brick warehouse in strict accordance with the plans and specifications and instructions to bidders. For further information apply to this office, or to the U. S. Indian Agent, La Pointe Agency, Ashland, Wis. W. A. JONES, commissioner. 1368

DORMITORY AND WATER AND SEWER SYSTEMS. [At Crow Agency, Mont.]

Department of the Interior, Office of Indian Affairs, Washington, D. C. Sealed proposals addressed to the commissioner of Indian Affairs, Washington, D. C., will be received at this office **until March 31, 1902**, for furnishing and delivering the necessary materials and labor required in the construction and completion of a brick or stone dormitory, and water and sewer systems at Pryor Creek, Crow Agency, Mont., in strict accordance with plans and specifications, and instructions to bidders. For additional information apply to this office, or to J. E. Edwards, U. S. Indian agent, Crow Agency, Mont. W. A. JONES, commissioner. 1369

CEMENT AND STONE. [At Ft. Wadsworth, N. Y., and Ft. Hancock, N. J.]

U. S. Engineer Office, Army Building, New York, N. Y. Sealed proposals for furnishing and delivering cement and broken stone at Ft. Wadsworth, N. Y., and Ft. Hancock, N. J., will be received here **until March 31, 1902**. Information on application. W. L. MARSHALL, major, engineers. 1369

OFFICERS' QUARTERS. [At Fort Adams, R. I.]

Office Constructing Quartermaster, 209 Thames St., Newport, R. I. Sealed proposals will be received here **until March 26, 1902**, for constructing, plumbing, heating and wiring 2 single sets frame officers' quarters, Fort Adams, R. I. Information furnished on application. THOMAS H. SLAVENS, Q. M. 1368

PIPE. [At Batesville, Ind.]

Sealed bids are wanted **until March 24** by the town clerk for furnishing and laying approximately 1¼ miles of 4-inch and 6-inch pipe, including hydrants and valves. Plans and specifications on file in the office of Sturtevant & Todd, 1208 Fisher Building, Chicago. 1368