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SUBSCRIBERS to the International Edition will receive with this week's issue the full quota of "additional" illustrations that, under our former system of publication, would be sent them distributed between this and the next twelve issues of the *American Architect*; thereafter and until the first issue for July the mail will bring them each week, in place of the familiar blue-covered International copy, the straw-colored copy of the Regular Edition with its quota of text and illustrations. So on July first they will find they have received the exact amount of text and illustrations that belong to a quarterly volume, but that it has reached them in an unusual combination and order. The change now made is an experimental one and can be continued or abandoned according as the subscribers express to us their approval or disapproval of it. For our own part, we are not in a position to know whether the change is likely to be a relief or an added burden; this number has certainly been burdensome, since we have had to prepare and manufacture in thirteen weeks the amount of illustrative material that hitherto has been evenly distributed over twenty-six weeks. But as the object of the change is not to procure relief for ourselves, but to render better service to our subscribers, we give to our own opinions and feelings a quite secondary place in the consideration of the problem. The illustrations contained in this issue afford excellent evidence as to the manner in which the change is beneficial to the subscriber: it seems to us that it is unquestionably rendering better service to place in the hands of a subscriber at one and the

same time all of the plates illustrating a given subject—"Wheatleigh," for example—than to dole them out to him two or three at a time during a succession of weekly issues more or less interrupted by the interpolation of dissociated material. One factor in the situation prejudicially affects the adoption of this new method of issuing the International illustrations in quarterly, in place of weekly, installments: we have been unable, as yet, to induce the postal authorities to allow us to send this quarterly issue through the mail prepared in such a way as to ensure it against damage in transit and place it in the subscribers' hands in a form that the quality and cost of the product requires and deserves. We have, however, prepared suitable heavy portfolio covers which can be mailed to any subscriber on the receipt of fifteen cents in stamps.

A BILL is pending before the New York Legislature to establish rules for the construction, ventilation and sanitation of school-houses and other public buildings, similar to those which have for several years been enforced in Massachusetts, to the very great advantage of school-children and other persons. The proposed New York law is very moderate in its demands in the matter of ventilation, requiring only fifteen cubic feet of fresh air per minute for each pupil in school-rooms, which is just half what Massachusetts children are by law entitled to, and, thanks to the efficiency of their good friends, the State inspectors, generally receive; but it would, perhaps, be difficult to enforce a more radical provision in New York at present. In other respects, the proposed law follows quite closely the statute of Massachusetts, and experience in the latter State has shown so clearly the great advantage to the public, and particularly to school-children, of such provisions that it can hardly be doubted that New York will adopt them. Architects of experience will remember that the Massachusetts law was passed with much difficulty. Nearly all "practical" persons ridiculed the idea of applying "theoretical" ventilation to school-houses, at least outside the great cities. They had learned to spell in school-houses heated by airtight stoves; or, in more advanced communities, by furnaces, which drew the air from the floor of the school-rooms, warmed it up, and sent it back into the rooms, in either case the same air, except so far as leakage around the windows, and transpiration through the walls might affect it, being served up through the entire winter. In extreme cases, a "ventilator" was provided, in the shape of a hole in the school-room ceiling, through which the hottest of the air escaped into the garret. In a community where such ventilation as this was the universal rule, and was perfectly satisfactory to all except a small group of "cranky" theorists, the task of introducing forced ventilation by law seemed hopeless, and there is good reason for suspecting that many of the legislators who voted for the passage of the bill never imagined that it would be enforced. For a time, in fact, its provisions were laughed at, but the inspectors quietly and perseveringly made their rounds, and, as one offender after another received a sharp admonition from the State officials, it began to dawn upon people that the new law was to be enforced. Even then, for many months it was systematically evaded. Multitudes of ventilation-fans, put in at the order of the Chief of the State Police, were operated only while the inspectors were looking on, and stopped as soon as their backs were turned; but even this reluctant concession showed people something of the difference between foul and fresh air, and the parents of the school-children soon began to interest themselves in seeing whether the law was complied with. A complaint from any one of these brought the State inspectors to the spot again, armed with their anemometers, and after a few school-houses had been ordered closed for non-compliance with the law, school-committees began grumblingly to prepare for obedience. All this was not very long ago, yet, since then, a great change has taken place. No architect in Massachusetts thinks now of planning a school-house without calculating the sizes of his ventilation-ducts, and studying the best position for them; and, if he neglects to do this, the State inspectors, who must approve the plans before they can be carried into execution, give him the necessary directions. When the school-house is built, if it is large enough to require steam-heating and fan-ventilation, a licensed engineer is engaged as a matter of course, not to stop the fan, and shut off the fresh air, as soon

as the inspectors are out of sight, but to keep the ventilating system in constant and efficient operation; and scholars, teachers and parents in Massachusetts, who now thoroughly appreciate the difference between good and bad air, would no more think of going back to the old system than they would of discarding their text-books of arithmetic, algebra, geography, Latin and French, and devoting their attention to the "New England Primer" and "Nature Display'd."

NEW HAMPSHIRE possesses a very energetic Society for the Protection of Forests, as well as some owners of forest land who are inspired with modern ideas in regard to their property. The latter have, within a few years, been quietly experimenting in forest planting, and the results are in the highest degree encouraging. Naturally, planting is done mostly with white pine, as this timber is easily grown in New Hampshire, and, owing to the exhaustion of the supply, brings a high price; and, as has been almost invariably the case where scientific forestry has been tried in this country, the rapidity of growth of the trees properly set out and cared for has surprised people accustomed only to the slow and uncertain increase of neglected forests. In one case, where young pines, five years old, were set out on a sandy hill twelve years ago, many of the trees are now seven inches in diameter, at two feet from the ground, and the thinnings alone are of considerable value. In another case, where a pine forest was carefully cut twelve years ago, so as to save the saplings, the latter are now beginning to furnish salable timber, ten years sooner than would have been the case under the usual management. While the more enlightened land-owners are carrying on practical experiments, the Society, which includes merchants and professional men, as well as forest-owners, is earnestly advocating a measure for the exemption from taxation of plantations of young pine, and pine forests scientifically managed, and it is hoped that it may be passed at the approaching session of the Legislature. If adopted, it will be, we think, the first statute of the kind in our timber-growing States, and its effect will be watched with great interest. So far as we can tell from the example of Germany, the result of such a law in New Hampshire should be to transform it rapidly from a rather declining community, with its principal wealth fast being stripped from it by railways and lumber corporations, into a prosperous and animated one, busily employed in producing and converting into valuable goods the unrivalled timber which Nature has given only to four or five of the States on the Atlantic slope, at the same time that it is storing up wealth, happiness and comfort for future generations. We have been told for the last fifty years that the decline of population in Maine, New Hampshire and Vermont was due to the fact that their inhabitants depended upon farming, and that the farmers in the Mississippi Valley could undersell them. The people of Vermont have had the good sense, instead of trying to compete with the Kansas farmers in raising wheat, to dig up, cut and send to market the beautiful marbles of which their State possesses an inexhaustible variety, and are beginning to be prosperous once more; and Maine, New Hampshire and Massachusetts have, in their soil and climate, unlimited resources for the perennial production of a timber which will grow in perfection nowhere else, except in portions of Pennsylvania and the Lake regions, for which there is a demand absolutely without limit, owing to its superiority to any other timber ever discovered, at prices three times as high as those which brought enormous fortunes to the owners of the pine lands of the last generation. To make available, however, the wealth which lies dormant in the soil of the white-pine States, patience and self-denial are necessary for a few years; and, as individuals without resources are unable to practise self-denial of this sort, it is indispensable that the State should help, if not by doing something to support the forest-planter and his family until his trees begin to be marketable, at least by relieving him of the burden of taxation. It must be remembered that, while a farmer can easily deduct a reasonable annual tax from the price of his yearly crops, the forest-planter has absolutely no resource, until his trees are marketable, for meeting taxation, except by taking from the scanty savings which he has been able to lay by in some other employment. No one can reasonably be expected to assume this burden, in addition to the heavy outlay required for starting a productive forest, and, until some distinction is made by the State authority, in which the difference between forest planting and potato raising is recognized, no general interest in forestry, on the part of people who own forest lands, can be hoped for.

THE Peabody Museum of American Archaeology of Harvard University, aided by contributed funds, recently fitted out an expedition to Copan, in Honduras, under the direction of Mr. George P. Gordon, which has done an excellent preliminary work in clearing and recording the hieroglyphic inscriptions on what is known as the Great Stairway, which leads from the plain up what seems to be an artificial pyramid, once, probably, crowned with a temple. The faces of the steps of the stairway were covered with hieroglyphic inscriptions, and the balustrade was sculptured with symbolical figures, while at least five statues stood at regular intervals on the steps and landings. When the Harvard expedition reached the spot, the ruins were buried in débris, and it has taken four years of labor to clear them. The whole stairway proves to have consisted of some seventy steps, each twenty-five feet long, the lower step being wider than the others. The lower step is not ornamented, but all the others are decorated on the face with hieroglyphics, in panels, interrupted occasionally by sculptured figures. All the figures seem to be in some way symbolic. Some of them hold in their hands a fish, which is very common in Central American sculpture, and seems to have some sacred significance; others are connected in some way with serpents, the rattlesnake being often shown; and serpents, alternating with figures of birds, form the decoration of the richly-carved balustrade. Of the statues which stood on the stairway many fragments remain, showing that they must have represented sitting figures, generally crowned with enormous head-dresses of plumes, sometimes mingled with serpents, and wearing, in at least one case, a breastplate representing a death's head, very much as Athena wore the head of Medusa. At the foot of the staircase are the remains of what is supposed to be an altar, having the form of some enormous animal, but now headless, and otherwise defaced. Some fragments of the sculpture show traces of colored stucco over the stone, and Mr. Gordon is inclined to believe that the whole of the staircase, with its balustrades, was once covered with stucco in this way. Of the temple to which the staircase led, nothing now remains in place, but many fragments of it are mingled with those of the staircase. In excavating to determine the form of the foundations of the temple, and the terraces which were connected with it, Mr. Gordon made the very interesting discovery that they rested on the remains of still older buildings, and, in some places, the traces of several distinct layers of débris were found, indicating that, as at Troy, the sacred Acropolis of Copan had been several times built over, in successive ages, the earliest structures dating, apparently, from an antiquity perhaps more remote than any yet known to archaeology.

PEOPLE who expect to go to London to witness the coronation of King Edward the Seventh next June will do well to avoid standing on the balconies of London houses to see the coronation procession, or any similar sight. A few days ago, some people were standing on the balcony of a house on Pembroke Square, in London, when the whole affair suddenly broke down, dropping the people on it into the area below. It appeared, on examination, that the iron supports of the balcony were fixed in a stone string-course which ran across the front of the house, and this string-course had split off for its whole length. It is probable that the rusting of the iron, where it was set into the string-course, had begun to split the stone, and a small additional strain was sufficient to cause its separation. There are numberless examples in this country of such splitting of stone, particularly of the hardest kinds, by the rusting of fence-posts, or other pieces of ironwork, fixed in it. The lead and sulphur generally used to secure the iron in its place are said to increase the disposition to rust, this being particularly the case with sulphur; and after some years, the stone around the point of insertion of the iron begins to split in the direction of least resistance, which is usually that of the length of the stone. Occasionally, the granite base of a long cemetery railing, or yard-fence, may be seen split from end to end in this way, and architects expect, as a matter of course, to find cracks in stonework in which iron has been set for any considerable time. Quite recently, some architects have discarded lead and sulphur for setting iron in stone, and have used clear Portland cement in place of them. Theoretically, this should diminish the tendency to rust, and an examination of ironwork so set might furnish valuable information in regard to the all-important question of preserving iron in contact with masonry from corrosion.

NOTES ON IRON AND STEEL CONSTRUCTION.¹—VI.

THE rivets used in structural work are of a low-grade steel, and the usual sizes range from $\frac{5}{8}$ inch to 1 inch in diameter, $\frac{3}{4}$ -inch diameter rivets being the most used; $\frac{3}{4}$ -inch and 1-inch diameter rivets are used where the plates and rolled shapes are heavy, or where the grip of the rivet—i. e., the distance from head to head—is great; $\frac{5}{8}$ -inch rivets are only for light work, principally for light trusses, stair and other architectural ironwork.

A joint will fail in two ways, i. e., by the shear of the rivets or by the crippling of the plate around the rivet-holes. The rivets never fail by bending, and their transverse strength is never considered. Rivets may be in either single or double

than these can be used when the material or workmanship is of exceptional quality, or economy demands it. The single shearing-value of any rivet is equal to the area of the rivet multiplied by the allowable unit shearing-stress, while the double shearing-value of any rivet is twice the single shear. The ordinary bearing-value of a plate is usually taken as the diameter of the rivet multiplied by the thickness of the plate multiplied by the allowable unit bearing-value. Where the plate is in web-bearing it is customary to take one and one-half times the ordinary bearing as the allowable bearing-value. When several rolled-steel shapes are held together by rivets which are driven when hot, there is a tendency of the rivets to clamp the plates or grip them by the contraction of the rivets on cooling. While experiments show that the rivets grip the plates to a

THE SHEARING-RESISTANCE OF RIVETS AND THE BEARING-VALUE OF PLATES OF DIFFERENT THICKNESSES.

Diameter of rivet.	Area of rivet.	Single shear,		Bearing-value for different thickness of plate — Unit-value = 12,000.							
		6,000	12,000	$\frac{1}{4}$	$\frac{5}{16}$	$\frac{3}{8}$	$\frac{7}{16}$	$\frac{1}{2}$	$\frac{9}{16}$	$\frac{5}{8}$	$\frac{11}{16}$
$\frac{3}{16}$	.1105	668	1,325	1,125	1,406	1,688					
$\frac{1}{4}$	.1964	1,178	2,356	1,500	1,875	2,250	2,625	3,000			
$\frac{5}{16}$	.3068	1,841	2,682	1,875	2,344	2,813	3,281	3,750	4,219	4,688	
$\frac{3}{8}$	.4418	2,651	5,301	2,250	2,810	3,375	3,938	4,500	5,063	5,625	6,188
$\frac{7}{16}$	.6018	3,608	7,216	2,625	3,281	3,938	4,594	5,250	5,908	6,563	7,219
1	.7854	4,712	9,425	3,000	3,750	4,500	5,250	6,000	6,750	7,500	8,250
Diameter of rivet.	Area of rivet.	Single shear,		Bearing-value for different thickness of plate — Unit-value = 13,500.							
		6,750	13,500	$\frac{1}{4}$	$\frac{5}{16}$	$\frac{3}{8}$	$\frac{7}{16}$	$\frac{1}{2}$	$\frac{9}{16}$	$\frac{5}{8}$	$\frac{11}{16}$
$\frac{3}{16}$	.1105	746	1,491	1,266	1,582	1,898					
$\frac{1}{4}$	.1964	1,325	2,651	1,688	2,109	2,531	2,953	3,375			
$\frac{5}{16}$	.3068	2,071	4,142	2,109	2,637	3,164	3,691	4,219	4,746	5,273	
$\frac{3}{8}$	.4418	2,982	5,964	2,531	3,164	3,797	4,430	5,063	5,659	6,328	6,961
$\frac{7}{16}$	.6018	4,059	8,118	2,953	3,691	4,430	5,168	5,908	6,645	7,383	8,121
1	.7854	5,301	10,603	3,375	4,219	5,063	5,906	6,750	7,594	8,438	9,281
Diameter of rivet.	Area of rivet.	Single shear,		Bearing-value for different thickness of plate — Unit-value = 15,000.							
		7,500	15,000	$\frac{1}{4}$	$\frac{5}{16}$	$\frac{3}{8}$	$\frac{7}{16}$	$\frac{1}{2}$	$\frac{9}{16}$	$\frac{5}{8}$	$\frac{11}{16}$
$\frac{3}{16}$	.1105	828	1,656	1,406	1,758	2,109					
$\frac{1}{4}$	.1964	1,473	2,945	1,875	2,344	2,813	3,281	3,750			
$\frac{5}{16}$	.3068	2,301	4,602	2,344	2,930	3,516	4,102	4,688	5,273	5,859	
$\frac{3}{8}$	.4418	3,313	6,627	2,813	3,516	4,219	4,922	5,625	6,328	7,031	7,734
$\frac{7}{16}$	.6018	4,510	9,020	3,281	4,102	4,922	5,742	6,563	7,383	8,203	9,023
1	.7854	5,891	11,781	3,750	4,688	5,625	6,563	7,500	8,438	9,375	10,313
Diameter of rivet.	Area of rivet.	Single shear,		Bearing-value for different thickness of plate — Unit-value = 20,000.							
		10,000	20,000	$\frac{1}{4}$	$\frac{5}{16}$	$\frac{3}{8}$	$\frac{7}{16}$	$\frac{1}{2}$	$\frac{9}{16}$	$\frac{5}{8}$	$\frac{11}{16}$
$\frac{3}{16}$	.1105	1,105	2,209	1,875	2,344	2,813					
$\frac{1}{4}$	.1964	1,964	3,927	2,500	3,125	3,750	4,375	5,000			
$\frac{5}{16}$	.3068	3,068	6,136	3,125	3,906	4,688	5,469	6,250	7,031	7,813	
$\frac{3}{8}$	.4418	4,418	8,836	3,750	4,688	5,625	6,563	7,500	8,438	9,375	10,313
$\frac{7}{16}$	.6018	6,013	12,026	4,375	5,469	6,563	7,656	8,750	9,844	10,938	12,031
1	.7854	7,854	15,708	5,000	6,250	7,500	8,750	10,000	11,250	12,500	13,750

NOTE.—All values between the heavy lines are greater than the single shear of the rivets and less than the double shear; so that, if the rivet is in single shear, that value is used, while, if the rivet is in double shear, the bearing-value of the plate is taken in designing the connection.

shear, and the bearing of the plate may be either ordinary or web bearing. Single shear is where the rivet tends to shear through one section only, as along the line *aa* in Figure 35, while double shear is where the rivet tends to shear across two sections, as shown along the lines *bb* in the same figure.

Web-bearing exists in a plate held between two side plates so that the bearing around the rivet-hole is in a direct line—i. e., there is no side pull upon the middle plate. The plates marked *c* and *d* in Figure 35 are in ordinary bearing, while the plate marked *e* is in web-bearing. The allowable unit shearing-value for steel rivets in building-construction is 7,500 pounds, while the allowable unit bearing-value is 15,000 pounds; higher values

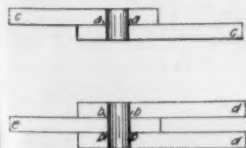


Fig. 35.

certain extent and prevent them from sliding one past the other, they have also proved that the amount of this gripping or clamping tendency is indeterminate; it is, therefore, not considered in the design of structural work.

Since a riveted joint or connection may fail, either by the shearing of the rivet or the crippling of the plate, it is necessary to analyze both values, and to determine where the failure is likely to occur, for the strength of the joint or connection depends upon the strength of its weakest part.

In order that the resistance of rivets or the bearing-value of the plates may readily be determined, a table such as the foregoing is often prepared; this table gives the shearing and bearing values for rivets of different diameters, and for plates of different thicknesses when different shearing and bearing values are considered. It will be found convenient for reference in all future calculations.

In structural work there are certain practical considerations

¹ Continued from No. 1368, page 85.

besides mere strength, that determine the spacing of rivets. These rules are practically standard.

In order that the rivet-hole may not pull out at the end of a plate, it is usual to make the distance from the centre of the rivet-hole to the edge of the plate not less than one and one-half times the diameter of the rivet, nor greater than eight times the thickness of the plate, while the minimum distance from the centre of a rivet-hole to the side edge of a plate should be one-half of the diameter of the rivet, plus one-half the thickness of the plate, plus $\frac{1}{8}$ inch. Rivets should never be placed closer together than three times the diameter, and the pitch should not exceed sixteen times the thickness of the thinnest outside plate, provided such a distance does not exceed 6 inches, though in plate-girder work it is sometimes found advisable to space rivets as far apart as 9 inches. Where rolled-plates are in compression, the maximum pitch in the direction of the stress should never exceed sixteen times the thickness of the plate, nor thirty-two times the thickness of the plate in a direction at right angles with the line of stress. Exception to this rule exists in cover plates of deep chords and end posts in a truss, where the pitch may be as great as forty times the thickness of the plate. At the end of compression-members the pitch should not exceed four times the diameter of the rivet for a length equal to twice the width of the member, while the pitch throughout the balance of the length may be made the maximum. The following table gives data regarding rivet-spacing which will be of value in the design of structural members:—

TABLE OF RIVET-SPACING GIVING MAXIMUM AND MINIMUM DISTANCES IN INCHES.

Size of rivet.	Minimum pitch.	Maximum pitch at the ends of columns and compression-members.	Minimum pitch in the flanges of girders.	Distance from edge to centre of rivet-holes.	
				Minimum.	Usual.
$\frac{1}{4}$	$1\frac{1}{2}$				
$\frac{3}{8}$	1	$2\frac{1}{2}$	3	$1\frac{1}{8}$	$1\frac{1}{2}$
$\frac{1}{2}$	$1\frac{1}{2}$	3	3	$1\frac{3}{8}$	$1\frac{3}{4}$
$\frac{5}{8}$	2	$3\frac{1}{2}$	$3\frac{1}{2}$	$1\frac{5}{8}$	$1\frac{5}{8}$
3	3	4	4	$1\frac{3}{4}$	2

It is customary in designing riveted connections that are to be put together in the field to allow 25 per cent greater resistance in the rivets than was employed in the shop-work. This is to allow for defects in workmanship and material, for in the field it is difficult to drive the rivets perfectly, and in extremely cold weather they are likely to be cooled very rapidly and driven at a low heat, the heads, in consequence, being very brittle and the rivets being insufficiently upset to fill the holes. In all rivet-work put together in the shop the holes are punched $\frac{1}{16}$ inch larger than the rivet. They should be made true to a templet, and no drift-pins should be used to bring the work together. It is advisable to drill all of the rivet-holes for field-connections, and these holes should be drilled while the pieces are securely clamped or bolted in correct juxtaposition. If they are punched they should be reamed so that excessive drifting in the field will be avoided. Rivets may be driven in shop or field; they may be countersunk on one or both sides or flattened. To designate upon a drawing in what manner the rivets should be driven it is customary to use Osborne's code. This code is shown in Figure 36 and is easily remembered after careful observation.

It is necessary in designing plate girders to have sufficient rivets through the vertical leg of the flange angles, in order to transmit the stress from the web to the flanges. Theoretically, the pitch of the rivets through the vertical leg of the flange angles would vary from the abutments to the centre, the rivets being placed very closely together at the abutment and extremely far apart towards the centre of the span. In order to

facilitate work in the shop it is usual to provide only two or, at the most, three different pitches throughout the length of a girder. Where the girder is divided by the stiffeners into panels and the length of the panel is equal to the depth of the girder, the pitch of the rivets in the vertical leg of the flange angles between any two stiffeners may be determined by dividing the vertical shear at the stiffener nearest the abutment by the allowable value for one rivet, and by dividing this result,

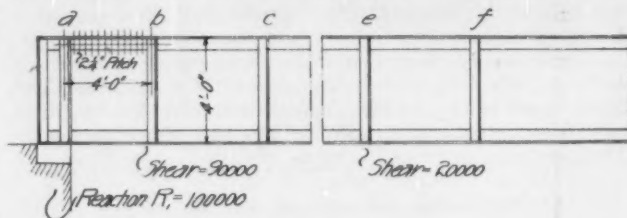


Fig. 37.

which is the number of rivets required between the two stiffeners, into the distance in inches between the stiffeners or the depth of the girder. For instance, it is desirable in Figure 37 to obtain the rivet-spacing between the points *a* and *b*. These points are 4 feet apart, which is the depth of the girder; the reaction *R*₁ equals 100,000 pounds. According to the above, therefore, the number of rivets required between *a* and *b* is equal to 100,000 pounds divided by the allowable resistance for one rivet. Supposing that the rivets are $\frac{3}{4}$ inch in diameter, the shearing and bearing values may be found from the foregoing table. The allowable unit shear is 6,000 pounds and the unit bearing-value is 12,000 pounds, so that a $\frac{3}{4}$ -inch rivet through a $\frac{1}{2}$ -inch web-plate and $\frac{3}{8}$ -inch flange angles will have an allowable value equal to the web-bearing of a $\frac{1}{2}$ -inch plate, or one and one-half times 2,810, which gives 4,215; then $100,000 \div 4,215 = 23.7$, or 24 rivets; dividing 24 into 48 inches, the distance between *a* and *b*, the pitch of the rivets, is ascertained to be 2 inches; this is somewhat below the minimum pitch, which, as previously stated, should never be less than three times the diameter of the rivet; it would, therefore, be good practice to pitch the rivets between *a* and *b* as near as possible to $2\frac{1}{4}$ inches.

Again, assume that it is desired to determine the pitch of the rivets between *b* and *c*. The shear at *b* on the girder is found to be 90,000 pounds; therefore $90,000 \text{ pounds} \div 4,215 = 21.3$, or 22 rivets; consequently, the pitch between *b* and *c* is equal to $48 \div 22 = 2.18$; this pitch is theoretical, and would probably be made the minimum pitch. At a panel nearer the centre of this girder, as at *e*, the shear is 20,000 pounds; then the number of rivets required between *e* and *f* would equal $20,000 \div 4,215$, or 4.7, say 5 rivets; $48 \div 5 = 9.6$ inches, the theoretical pitch between *e* and *f*; this greatly exceeds the allowable pitch for rivets in a compression-member. Since the upper flange is practically a compression-member, the rivets must be spaced not farther apart than 6 inches; the rivets throughout the girder then would probably be spaced through the first two panels $2\frac{1}{4}$ inches; through the next two, 3 inches; the next two, 4 inches, and throughout the remaining portion of the girder, 6 inches.

A somewhat similar method, though more accurate, for proportioning the rivets through the flange angles and web-plate of a girder is to determine the increment of stress transmitted from the web-plate to the flange angles at each point. The maximum increment of the horizontal flange stress at any point in the length of a plate-girder is equal to the shear at that point divided by the depth of the girder in inches; consequently, if the increment for each inch in length may be determined, the pitch of the rivets may readily be ascertained by dividing

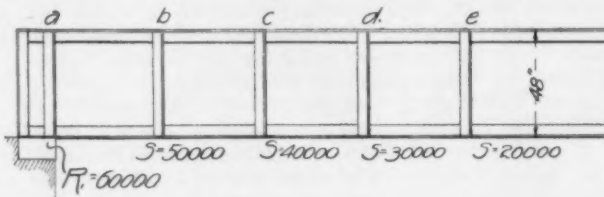


Fig. 38.

the allowable resistance of one rivet by the increment. Assume that it is desired to proportion the rivets throughout the vertical leg of the flange angles in the girder shown in Figure 38 and also assume that the allowable resistance of one rivet is

4,000 pounds; the reaction R_1 equals 60,000 pounds, and the increment of stress at a, b, c , etc., is as follows:—

Increment a = shear a = 60,000 pounds $\div$ 48 = 1,250
 Increment b = shear b = 50,000 pounds $\div$ 48 = 1,042
 Increment c = shear c = 40,000 pounds $\div$ 48 = 833
 Increment d = shear d = 30,000 pounds $\div$ 48 = 625
 Increment e = shear e = 20,000 pounds $\div$ 48 = 417

Since the allowable resistance of a rivet equals 4,000, then the pitch of the rivets between the several points is as follows:—

Between a and b = $4,000 \div 1,250 = 3.2$
 Between b and c = $4,000 \div 1,042 = 3.8$
 Between c and d = $4,000 \div 833 = 4.8$
 Between d and e = $4,000 \div 625 = 6.4$
 Between e and f = $4,000 \div 417 = 9.6$

From the above tabulation, in practice the girder would be designed with rivets pitched 3 inches apart in the first panel, 4 inches apart in the next, while between c and d would probably have the rivets spaced 5 inches apart, the rivets throughout the remaining length of the girder being spaced the maximum distance, namely, 6 inches.

The rivet-spacing in the vertical leg of the flange angles may be determined by another method, which consists in calculating the bending-moment at the several panel points, and then determining the flange stress at these points. When the flange stress has been determined at any point, the number of rivets between that point and the abutment may be determined by dividing the flange stress by the allowable resistance of one rivet.

Example.—The girder shown in Figure 39 is loaded with a

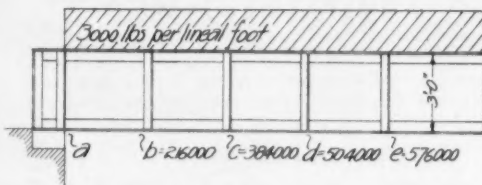


Fig. 39.

uniformly distributed load of 3,000 pounds per linear foot, and the bending-moment at a, b, c, d and e is as follows:—

a = 0 foot-pounds.
 b = 216,000 foot-pounds.
 c = 384,000 foot-pounds.
 d = 504,000 foot-pounds.
 e = 576,000 foot-pounds.

The flange stress at the several points is, therefore, as follows:—

a = $0 \div 3 = 0$
 b = $216,000 \div 3 = 72,000$
 c = $384,000 \div 3 = 128,000$
 d = $504,000 \div 3 = 168,000$
 e = $576,000 \div 3 = 192,000$

From the above data the number of rivets between b and a may be found by dividing the flange stress by the allowable resistance of one rivet, likewise the number of rivets between c and a may be found by dividing the flange stress at c by the allowable value for one rivet; by deducting from the number of rivets required between c and a , the number of rivets necessary between b and a , the rivets between c and b may readily be found. Likewise the rivets between d and c may be obtained by deducting from the number of rivets required between d and a the number of rivets necessary between c and a . Having the number of rivets between each of the panel points, the pitch may readily be found by dividing the number of rivets into the distance between the centres of the stiffeners. If in the girder in question the allowable resistance of one rivet is 4,000 pounds, the number of rivets between the several points may be obtained by the following calculation:—

Number of rivets, a to b = $72,000 \div 4,000 = 18$
 Number of rivets, a to c = $128,000 \div 4,000 = 32$
 Number of rivets, a to d = $168,000 \div 4,000 = 42$
 Number of rivets, a to e = $192,000 \div 4,000 = 48$

Then

Number of rivets, a to b = 18
 Number of rivets, b to c = $32 - 18 = 14$
 Number of rivets, c to d = $42 - 32 = 10$
 Number of rivets, d to e = $48 - 42 = 6$

Pitch of rivets, a to b = $48 \div 18 = 2.66$ inches.
 Pitch of rivets, b to c = $48 \div 14 = 3.43$ inches.
 Pitch of rivets, c to d = $48 \div 10 = 4.8$ inches.
 Pitch of rivets, d to e = $48 \div 6 = 8$ inches.

Besides these several analytical methods the rivet-spacing in the flange-angles may readily be determined graphically by the

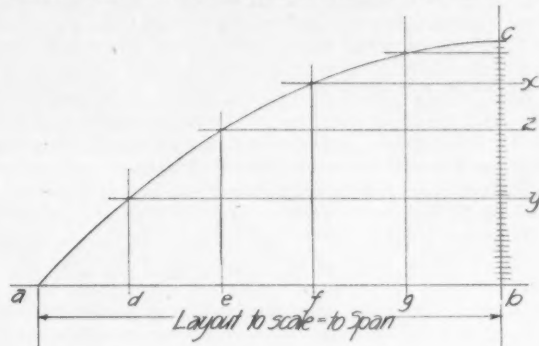


Fig. 40.

use of the parabolic curve, as explained in connection with the shortening of the flange-plates; that is, of course, where the girder is uniformly loaded. Figure 40 shows parabolic curve $a-c$; the line $c-b$ is laid off into as many equal parts as there are rivets required between the centre of the girder and the abutments. The number of rivets may be determined by any of the above-described methods, *i. e.*, by calculating the flange stress at the centre of the girder by means of the formula $\frac{WL}{D8}$, in which W equals the uniform load upon the girder, L the length of the girder in feet, and D the depth of the girder in feet. The distance $a-b$ in Figure 40 is laid off to scale equal to one-half of the span of the girder, and at the points where it is desired to change the pitch of the rivets, as at d, e, f, g , etc. (these points being usually located at the centre line of the stiffeners), extend upward the ordinates as shown until they intersect the parabola; from these points of intersection describe the horizontal lines, and by counting the number of divisions between these horizontal lines, the number of rivets between the several panel points, or points at which it is desired to change the pitch, may be determined. For instance, in the figure the number of divisions between b and y denotes the number of rivets required between a and d , while the number of rivets between d and e , and e and f , may be determined by counting the number of division between $y-z$, and $z-x$ respectively. By making a general diagrammatic scale having for its principle this method, a convenient means of obtaining the number of rivets required through the vertical leg of the flange-angles may be obtained.

In spacing the rivets through the horizontal leg of the flange angles—that is, through the cover-plates—it is good practice to place sufficient rivets in the end of each cover-plate, pitched at a distance not farther apart than four times the diameter of the rivet in order to equal in resistance the net sectional area of the plate; the rivets throughout the remaining length of the plate being spaced at the maximum pitch. For instance, in a $12'' \times \frac{1}{2}''$ plate there are two $\frac{3}{4}$ -inch rivet-holes in a straight line across; in consequence, the net area of the plate is practically 5 inches; if the allowable unit-stress of the material is 15,000 pounds, the net strength of the plate is 75,000 pounds.

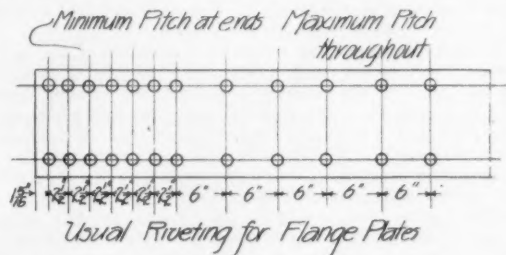


Fig. 41.

Provided the rivets have an allowable resistance of 6,000 pounds, there will be required in the end of the cover-plate $75,000 \div 6,000$, or 12.5 rivets, or 13. As this is an odd number, and because the rivets are spaced symmetrically along

each edge of the cover-plate, 14 rivets will be required in the end. These will be spaced as shown in Figure 41; the remaining rivets throughout the length of the cover-plate being 6 inches.

It is difficult to obtain rolled angles and plates longer than 70 or 80 feet—*i. e.*, when they are of any size; it is, therefore, often necessary to splice both the cover-plates and flange-angles. It is not necessary that all splices in the upper chord be heavy, because they are only needed to keep the plates and angles in alignment, since this portion of the girder is in compression, but where it is necessary to provide splices in the lower flange of the girder, care should be taken in proportioning the splice to obtain the greatest percentage of strength, and sufficient rivets must be placed in each side of the abutting joint to equal the net resistance of the rolled section. Wherever possible these splices should be placed as near as possible to the abutments, because at such points the bending-moment is less. Where the flange-angles are spliced, the splices should not occur opposite each other—*i. e.*, the joints should be broken.

The application of the several principles and rules set forth in the foregoing will be demonstrated in a future article, which will show the general design and several details of construction for plate-girders, and their connections to structural-steel columns such as would commonly be used in building-construction.

M. M. SLOAN.

(To be continued.)

LA HUNAUDAYE, BRITTANY.

THERE are many crumbling old ruins in France and not a few in Brittany, but none more lonely or forgotten than that of the castle of La Hunaudaye, buried in a forest that looks as if it had not changed in the last thousand years.

The forest of La Hunaudaye, or forest of Laumor, as it was also called, was, in the Middle Ages, a rendezvous for all the brigands of the country. They used to attack travellers who passed that way and were not sufficiently guarded. Among those who suffered was the Bishop of Saint-Brieux, who, one day in the fourteenth century, was attacked by these ruffians while crossing the forest and only liberated on his promising to pay a heavy ransom, losing at the same time his horses and all his baggage. The trees of this forest were principally oak, beech and chestnut—that truly Breton tree, which also furnished a thick undergrowth in which the wild boar was often found. Badgers and squirrels are at the present time its most dangerous inhabitants, although, if the winter is severe, it is not uncommon to see a pack of hungry wolves come stealing out in quest of prey which they failed to find in its dark retreats.

It was not only on account of the atrocities committed by its robbers that the forest of La Hunaudaye was famous; far greater was the terror caused to all the Breton peasants by its owner, the noble and puissant Seigneur Tournemine de la Hunaudaye, whose magnificent castle, built in the years 1214-1220, was noted in the annals of Breton chivalry. Its architect, says Freminville, wished to unite elegance with strength. The castle, standing in the centre of the forest, was in shape heptagonal, flanked by seven towers a good deal higher than the main building and surmounted by turrets. In addition to these, two other towers protected the entrance, one on each side, the whole surrounded by a double moat; the walls were about forty feet in height and of great thickness. Both walls and towers were surrounded by outstanding parapets so that, in case of attack, boiling oil and melted pitch might be poured on the besiegers. In the centre of the court was a deep well, where the inhabitants could always get their supply of water in times of war.

But none of this original splendor longer exists, for during the French Revolution violent hands were laid on the castle, as on so many others, and it suffered the same fate; its owner was forced, by order of the directors of the district of Lamballe, a town some fifteen miles distant, to set fire to his own castle, lest it should fall into the power of the Royalist army. It was then the property of Mme. de Talhouet, a descendant of the family of Tournemine. It is said the fire lasted eighteen days before it burned itself out.

The prison-tower in particular attracts the attention of the visitor of the present day, its walls being covered with inscriptions or figures carved on the stones by the prisoners who had been detained there. One of the figures is an infant swathed according to the custom of the country; another, a cross and stars. This is the only apartment that still keeps its roof; it was stone-vaulted, and so resisted the fire. The entrance to the prison is easily recognized, as there are triple doors, and in the wall holes or sockets into which the bolts were shot; besides, there are other and deeper holes, where bars of iron could be placed across for greater security. In the centre of the castle stood the chapel, its Gothic windows and carved doors bearing testimony to its pristine beauty. Directly under the chapel is the entrance to a subterranean passage, its secret door having been burned away with all the rest. Should any one be tempted to explore this dismal route he will encounter complete darkness, a cold, damp feeling and a most peculiar noise, caused by a multitude of bats escaping from the unusual sight of a visitor to their abode, for few

strangers go to La Hunaudaye, and the peasants rarely go inside the castle at all, much less would they venture into the gloom of its underground mysteries. If you ask why, you would probably get the same answer as did the writer from an aged peasant living on the farm close at hand, who told this tale in Breton-French:

"Some hundred years ago, monsieur," said he, "the castle was owned by Seigneur de Tournemine, an atrociously cruel man, who, in order to get possession of it, killed his father and his elder brother. His wife, who was a good woman, often reproached him with his crime, so he got rid of her in the same way. A few days after he had murdered her, a dreadful storm arose. It was late at night, and the Seigneur was sitting in his room when a loud knock sounded at the door. The sentinels had not observed any one come down the avenue, which, as you see, is over a mile long. However, a tall man, dressed in red, was ushered into the Seigneur's presence. Every one was greatly astonished to find that, although it was raining in torrents outside, his clothes were perfectly dry. 'Who art thou?' said De Tournemine, 'and how dare you come into my castle without a retinue at this hour of night?' 'My retinue is present,' answered the strange visitor. 'Let them appear,' and instantly the three figures of the father, brother and wife became visible. All were ghastly white and wrapped in shrouds, which they opened, and showed the blood pouring from their wounds. Then the cavalier in red said: 'Baron, I have no other guard,' and pointing to the eldest of the three spectres he added, 'There is your father, a holy old man, who was slain by a dagger thrust. There,' turning to the younger, 'is your brother, and there is your wife. You are the murderer of all three, and you know it.' Then the three ghosts laid hold of the Seigneur de Tournemine and he fell dead at their feet. The man in red laughed and all four vanished. During this time the lightning was rending the skies and peal after peal of thunder reverberated in the valleys."

Such is the legend of La Hunaudaye, and the country-folk believe that the castle is still haunted by the mysterious four.—*N. Y. Tribune.*

ILLUSTRATIONS

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

TENTATIVE SKETCHES FOR "WHEATLEIGH": HOUSE OF H. H. COOK, ESQ., LENOX, MASS. MESSRS. PEABODY & STEARNS, ARCHITECTS, BOSTON, MASS.

PRELIMINARY STUDY FOR THE SAME.

TERRA-COTTA DETAILS FROM THE SAME.

STATUE OF "HELVETIA" IN THE ENTRANCE-HALL OF THE UNION BANK BUILDING, ZURICH, SWITZERLAND. RICHARD KISSLING, SCULPTOR.

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

THE CHÂTEAU DE CLAMBEAU, NIÈVRE, FRANCE. M. NARJOUX, ARCHITECT.

This plate is copied from *La Construction Moderne*.

[Additional illustrations in the International Edition.]

"WHEATLEIGH": HOUSE OF H. H. COOK, ESQ., LENOX, MASS. MESSRS. PEABODY & STEARNS, ARCHITECTS, BOSTON, MASS.:—

THE ENTRANCE—FRONT.

MAIN ENTRANCE.

A GATE—POST.

REAR ENTRANCE—ARCADE.

SIDE VIEW.

LAWN FRONT.

GARDEN FRONT.

HARVARD UNION, H. U., CAMBRIDGE, MASS. MESSRS. MCKIM, MEAD & WHITE, ARCHITECTS, NEW YORK, N. Y.:—

THE REAR VIEW.

EAST END OF LIVING—ROOM.

WEST END OF LIVING—ROOM.

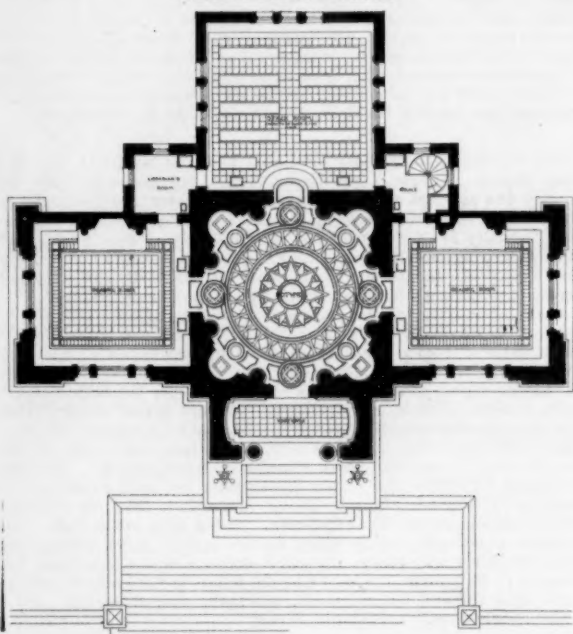
DETAILS OF INTERIOR TREATMENT OF THE HOUSE OF COLONEL GUFFEY, PITTSBURGH, PA. MR. GEORGE T. PEARSON, ARCHITECT, PHILADELPHIA, PA.: SIX PLATES.

HOUSE OF GIRAUD FOSTER, ESQ., LENOX, MASS. MESSRS. CARRÈRE & HASTINGS, ARCHITECTS, NEW YORK, N. Y.:—

THE SOUTH FRONT.
THE VESTIBULE.
THE MAIN HALL.
MANTELPIECE IN THE MAIN HALL.
THE MAIN STAIRCASE.
THE PALM-HOUSE.
THE PALM-HOUSE ENTRANCE.
THE DINING-ROOM.
THE DEN.
THE LIVING-ROOM.
A FIREPLACE IN THE LIVING-ROOM.
A CORNER IN THE PARLOR.
FIREPLACE END OF THE PARLOR.

THE FIELD MEMORIAL LIBRARY, CONWAY, MASS. MESSRS. SHEPLEY, RUTAN & COOLIDGE, ARCHITECTS, BOSTON, MASS.:—

THE MAIN FRONT.
ENTRANCE PORTICO.
THE DELIVERY-ROOM.



"ELM COURT": HOUSE OF W. D. SLOANE, ESQ., LENOX, MASS. MESSRS. PEABODY & STEARNS, ARCHITECTS, BOSTON, MASS.:—

THE LAWN FRONT.
THE NEW FRONT.
THE ENTRANCE FRONT.
SIDE ENTRANCE.

STATUES FROM THE MAXIMILIAN TOMB, INNSBRUCK, TYROL, AUSTRIA: FOUR PLATES. DRAWN BY A. C. CONRADE.

THE tomb of Maximilian I in the Hofkirche at Innsbruck is one of the most remarkable memorials that exist, partly because the tomb does not enclose the remains of the Emperor, who was actually sepulchred at Wiener Neustadt, and partly because, besides the marble tomb itself, adorned with twenty-four bas-reliefs and a bronze effigy of the Emperor kneeling upon the top, the memorial includes a remarkable series of colossal bronze statues, twenty-eight in number, that stand on a stylobate in the intercolumniations of the nave and the transept crossing. These statues are, in the main, the work of Gregory Löffler, that is, the best of them are his work, while others are due to the lesser skill of the brothers Godl. We believe that some of the series were never finished and set in place and are represented by incomplete fragments which still lie in a storeroom, the process of founding and erecting having been interrupted by the wars of the period. Should any one try to assemble a complete statue from this mass of *disjecta membra* a successful result would doubtless be impossible, since, during the wars referred to, much of this bronze material was seized, put into the melting-pot, and converted into arms of such precision as the advance of military science at that time made possible. Nevertheless, the task has been essayed and the figure of "Theodobert, Duke of Burgundy" is the result. It is said that sculptors nowadays have no difficulty in deciding that the sculptor entrusted with the task assembled the wrong fragments and produced a compound result very different from that intended by the original artist. At all events, this meddler was a man of such inferior prowess that he was unable to model a likeness of the Duke, and to disguise his incompetence represented the Duke with the visor of his jousting-helmet lowered.

STATUES FROM THE MAXIMILIAN TOMB, INNSBRUCK: SEVEN PLATES. DRAWN BY MR. C. HOWARD WALKER, ARCHITECT, BOSTON, MASS.

WHEN, a few weeks ago, we came upon, in the *Builder*, Mr. Conrade's interesting drawings of some of the statues in the nave of the Hofkirche, we were at once reminded of the very complete and remarkable water-color drawings exhibited at the Boston Art Club last year by Mr. C. Howard Walker, and we thought it would be interesting, merely as an exhibition of comparative draughtsmanship and artistic skill and feeling, to reproduce those of Mr. Walker's drawings which depicted the same figures drawn by Mr. Conrade. We little imagined that when placed side by side such singular and inexplicable variations and discrepancies would be revealed, and knowing the full history of Mr. Walker's work and his ability, skill and accuracy, we cannot but wonder where Mr. Conrade procured the data on which he founded his drawings. Not upon photographs, evidently, first, because, with the exception of the "King Arthur" and one or two more, the figures have never been allowed to be photographed, and, next, because had they been founded on photographs there would not have existed the discrepancies between them and Mr. Walker's careful work. Sceptres and swords would not appear in hands that Mr. Walker found empty; sword-hilts and daggers would not appear on the wrong side, and the form and position of armorial shields would have been alike in both sets of drawings. A justifiable inference is that Mr. Conrade founded his drawings, made in 1901, on some older published sketches secured at a time when the prohibition against drawing and photographing in the Hofkirche was not so strictly enforced as now.

We will leave to Mr. Walker to tell at another time and in another place the interesting story of how, by address, persistence and a goodly allowance of Yankee shrewdness, he at length secured permission to sketch a few of the statues—which it seems are not so much Crown property as a part of the personality of the Emperor Francis Joseph—and how by the use of an allowable subterfuge and the speediest of workmanship he managed to expand his "few sketches" into a practically complete record of the entire series. As shown on the walls of the Art Club two years ago, the drawings formed one of the most interesting exhibits that were ever hung there, and formed an impressive monument of industry, perseverance and artistic skill.

A MONUMENT TO THE MEMORY OF M. EDOUARD REMY, LOUVAIN, BELGIUM. M. P. BRÄCKE, SCULPTOR.

This plate is copied from *L'Emulation*.

VIEWS AT THE PAN-AMERICAN EXPOSITION, BUFFALO, N. Y. AFTER PHOTOGRAPHS BY MR. CONRAD BAER, BUFFALO, N. Y.:—

THE ELECTRIC TOWER. MR. JOHN GALEN HOWARD, ARCHITECT, NEW YORK, N. Y.

"GEN. W. T. SHERMAN": MODEL OF EQUESTRIAN STATUE FOR NEW YORK, N. Y. MR. AUGUSTUS ST. GAUDENS, SCULPTOR;—"THE CHALLENGE." MR. CHARLES CARY RUMSEY, SCULPTOR.

THE TRIUMPHAL CAUSEWAY. MESSRS. CARRÈRE & HASTINGS, ARCHITECTS. MR. KARL BITTER, SCULPTOR.

THE "FOUNTAIN OF MAN." MR. CHARLES GRAFELY, SCULPTOR;—THE "FOUNTAIN OF NATURE." MR. GEORGE T. BREWSTER, SCULPTOR.

THE "STRUGGLE FOR EXISTENCE": A FOUNTAIN. MISS ENID YANDELL, SCULPTOR;—TERMES AND ELECTRIC CANDELABRA IN THE SUNKEN GARDEN

A PAVILION OF THE MANUFACTURES BUILDING. MESSRS. SHEPLEY, RUTAN & COOLIDGE, ARCHITECTS, BOSTON, MASS.;—TERRACE OF THE PROPYLEA. MESSRS. BABE, COOK & WILLARD, ARCHITECTS, NEW YORK, N. Y.

"THE CHARIOT RACE." MR. FREDERIC G. ROTH, SCULPTOR.

BASE OF THE "FOUNTAIN OF NATURE." MR. GEORGE T. BREWSTER, SCULPTOR.

DOORWAYS AT BEAUVAIS AND PROVINS, FRANCE.

TRANSEPT DOOR, CATHEDRAL OF COUTANCES, MANCHE, FRANCE;—CHURCH DOORWAYS, LE-MESNIL-ST.-DENIS, FRANCE.

CHURCH AT BERZY-LE-SEC, NEAR SOISSONS;—CHURCH AT BRAINE, FRANCE.

CHURCH AT FROUVILLE, FRANCE;—ABBAYE DE LA LUZERNE, ST. PIERRE-LANGERS, MANCHE, FRANCE.

CHURCH AT VAILLY, AISNE, FRANCE;—CHURCH AT VASSENY, NEAR SOISSONS, FRANCE.

CANDELABRA, 149 BROADWAY AND 20 BROAD ST., NEW YORK, N. Y.

"THE MEDICINE MAN," PARIS EXPOSITION OF 1900. MR. C. E. DALLIN, SCULPTOR;—COLONNADE OF THE LOUVRE AND FREMIET'S STATUE OF "VELASQUEZ," PARIS, FRANCE.

THE FOUNTAIN OF ST. SULPICE, PARIS, FRANCE. L. T. J. VISCONTI, ARCHITECT;—THE CHAPEL OF THE SORBONNE, PARIS, FRANCE. JACQUES LEMERCIER, ARCHITECT.



WILKINS'S OVERBIG BATTLE-PIECE.—An elephant of a picture is troubling the souls of the Corporation of Hastings-by-the-Sea, England. It is a battle-piece 31 feet 8 inches wide and 17 feet 6 inches high. Painted by Wilkins in 1820, it has never found a wall big enough to contain it, though the Corporation paid \$7,500 for it eighty-two years ago. The last suggestion is to offer it to Sir Augustus Webster, the new owner of Battle Abbey, the building erected on the spot where Harold fell to express the gratitude of Duke William for his victory. The moment chosen by Wilkins is the last charge of Duke William, when Harold had fallen by a chance arrow and the Saxons began to flee.—*N. Y. Times*.

THE DOME OF THE PARIS PANTHEON.—The dome of the Panthéon at Paris, beneath which the centenary of Victor Hugo was celebrated, is constructed entirely of stone, and is placed in the centre of a Greek cross. It is supported by four triangular piers strengthened by engaged columns of the Corinthian order. The four piers with the lines of the intermediate arches form externally a large square, each side of which is 74 feet 9 inches. These four piers are pierced above with arched openings, and between the piers with the openings are large arches, the diameter of which is 44 feet 11½ inches, and the height 85 feet 5 inches. Between these arches rise the corbellings, which are gathered in to form the circular plan of the drum. The arches and the corbellings are crowned with a large entablature 13 feet 4 inches high. The upper part of the cornice of the entablature is raised 101 feet above the pavement of the nave. The diameter taken at the frieze is 66 feet. The internal drum which is constructed on this entablature is 55 feet 7½ inches in height to the springing of the internal dome. The interior of this drum is decorated with a continuous stylobate, which is the basement of a colonnade of sixteen Corinthian columns almost isolated from the wall. These columns are 35 feet 2½ inches in height. Between the columns are sixteen windows; four of which are false, and placed above the four piers of the dome. The colonnade is crowned with an entablature, above which is a large plinth which rises to the springing of the internal dome. The internal dome is 66 feet 8½ inches in diameter at the springing, and is decorated with octagonal caissons or sinkings with a rose in the centre of each. The eye at the top of the dome is 31 feet 3½ inches in diameter. Through this eye is seen the upper part of another or intermediate dome. The external dome is placed on a circular base 108 feet 7½ inches in diameter and square at the bottom. The angles are strengthened by flying-buttresses. Above the corbellings a circular wall is constructed, forming an external continuous stylobate which supports an external colonnade. The external colonnade constructed on the stylobate forms a peristyle round the dome, and is composed of thirty-two isolated columns of the Corinthian order 36 feet 5½ inches high. This colonnade is divided into four parts by the solid constructions in masonry raised over the four piers. The external colonnade is surmounted with an entablature and balustrade above it. There is an attic constructed above the circular wall of the drum, set back 13 feet 10 inches, and pierced with sixteen windows, twelve of which light the space between the internal dome and the intermediate dome which bears the lantern. This attic is terminated with a cornice with a step or plinth above. The external dome, 77 feet 8½ inches in diameter, measured on the outside, is constructed with masonry; the height is 45 feet 9½ inches from the top of the attic to the underside of the finishing against which the curve terminates. The outside of the dome is covered with lead, and is equally divided vertically by sixteen projecting ribs. The intermediate dome, built for the purpose of carrying the lantern, was intended to be decorated with subjects by the painter. The form of this dome resembles the small end of an egg; its springing commences at the base of the attic at the point where the internal dome begins to disengage itself. This dome is 50 feet ¾ inch high, 3½ feet and 70 inches in diameter, and is pierced with four great openings at the lower part 37 feet 3 inches high and 30 feet 10½ inches wide at the base. On a circular platform above the summit of the dome are eight piers with arches, which support the finishing against which the external dome terminates. Above this is the lantern of the dome.—*The Architect*.

A DAY'S WORK IN BRITISH BRICKLAYING.—A long letter from Mr. Stewart, the building-manager to the British Westinghouse Electric Co., relating to the number of bricks per day laid by the bricklayers engaged in the erection of the works for that company at Manchester, appeared recently in the *Times*. Replying to the questions, "What is the thickness of the walls? Was mortar or cement used?" Mr. Stewart says that in no instance are the walls less than 19 inches thick, and that in some instances they are 23 inches thick, also that mortar was used, not cement. All the walls are "piers." In the centre of each brick pier is a large "Z" bar steel column. With one exception all the buildings are faced with No. 2 stock-brick. This work may therefore be regarded as closely approximating in character to that performed by the bricklayers employed by the London County Council, but the average number of bricks laid per man per day was 1,400, as against the trade-union standard of 450, or the London County Council average of 330. For "common work" the Westinghouse now averaged 2,250 bricks per man per day. Some explanation of the difference between the speed of British and American work is to be found in the following statement: "Our mortar is made much softer than that commonly used in England, and the bricks are laid by a light pressure of the hand and a light tap of the trowel, instead of by repeated hammering of the trowel to force the brick into place in stiff mortar. By the use of soft mortar we can lay enough mortar with one stretch of the trowel for half a dozen to a dozen bricks." Now, one stretch of the trowel with stiff mortar such as is used here will suffice only for three

bricks, and it is evident, therefore, that since each trowel-charge of stiff mortar is of greater weight, and is more difficult to work, than the same charge of sloppy mortar, and will suffice for less than one-half the number of bricks, the weight of mortar and the work expended on a given area of finished brickwork laid on the British system must be much greater than a similar area laid on the American system. For 9-inch walls there is no doubt that the maxim, "Wet bricks and stiff mortar," must be retained, but it is possible that for walls exceeding 18 inches in thickness British builders may without much risk increase the speed of bricklaying by using more water in the mortar. We are of opinion that the use of sloppy mortar in the American fashion produces inferior brickwork to that erected on the British system, though we have never heard that American brickwork is unsafe, and modern factories are seldom required to be durable in the British sense of the term. But even for high-class British work the number of bricks laid per day should not be less than 600.—*The Builder*.

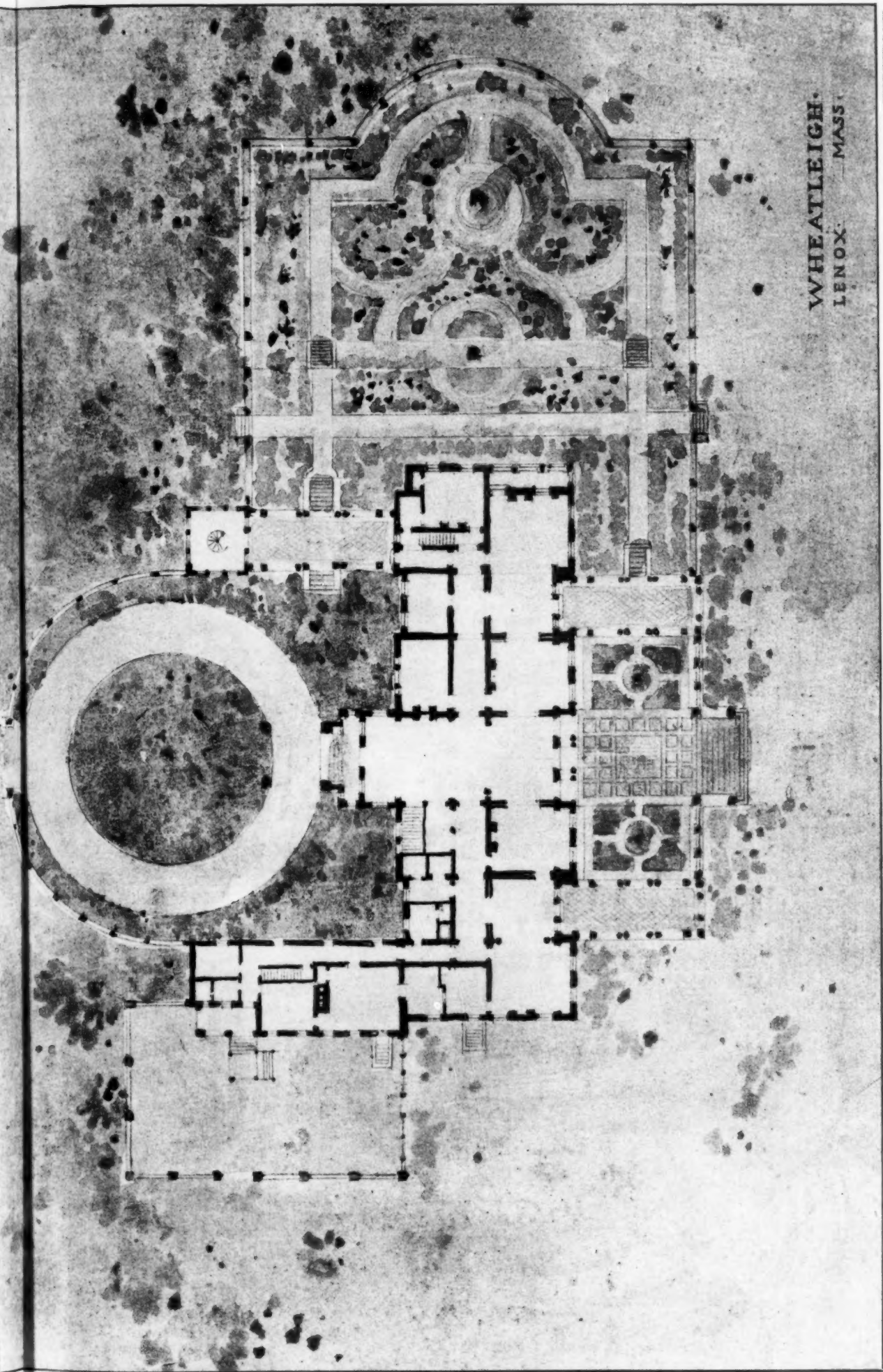
EL CAMINO REAL.—A California association is making an effort for the restoration to usefulness of "El Camino Real," the royal road, or the king's highway, which was travelled by the Franciscan missionary friars in the days, more than a century ago, before the "gringos" invaded the land. This road was the most direct route practicable between the pueblos and the missions. It ran through very many of what are now the counties of the State, and the supervisors in these counties have been asked to aid the movement. Many of them have consented. Little engineering science was used in the layout of the road. It sought a direct route where practicable, but it avoided obstacles, and it would be of little commercial use in these hurrying days. But the presidios, pueblos, and missions are "drawing" objects of interest to the tourists, and it is thought that interest would be increased if opportunity were afforded these later pilgrims to travel from mission to mission over the roads which had been trodden by the sandals of the friars and the boots of the Spanish soldiery.—*N. Y. Evening Post*.

WATER-LEAKAGE IN NEW YORK.—A recent writer in one of the daily papers of New York City ridicules the assertion that about seventy-five per cent of the Croton supply of water "enters the foundation-walls of the buildings along the many miles of mains." He shows that "seventy-five per cent of the daily delivery of New York's water-supply escaping into the ground, as they would have us believe, would play havoc with the streets by washing out the earth and causing the streets to cave in when heavy teams passed over these places." There is waste, of course, but the greatest amount (he insists) is in the older parts of the city. Yet it is these that "the heaviest trucks traverse, and a washout from a large leak would let a truck down." He would not be surprised to learn, however, "after an investigation, that, when the service-pipe is abandoned, the entire line from the buildings to the main, ferrule, or cock, is not removed, but only cut off at the curb line and the pipe hammered together—a custom by no means uncommon with contractors and plumbers—in which case there must be much and constant waste from these abandoned service-pipes." The writer proceeds: "I believe the Water Department had such experience only recently in Hanover Square. As an illustration, take the site of the new Custom-house at Bowling-Green. There once stood forty or fifty separate buildings, with as many service pipes. Have they all been removed all the way out to the street mains, and the taps in the mains plugged? Of course, the new Custom-house is not going to use all of those little fellows, but, no doubt, will make one, or several, new and larger connections."—*Fire and Water*.

APARTMENT-HOUSES NOT TENEMENTS.—The question before Justice Truax, at the Special Term of the Supreme Court, in the case of George Kitching against Kate C. Brown, was whether the defendant had violated a covenant in 1873 not to erect tenement-houses on his premises. Mr. Brown has erected three modern apartment-houses, each seven stories in height and each containing two apartments on a floor. Each suite has a parlor, dining-room, library, kitchen, five bedrooms, and servants' quarters. The buildings have every modern convenience. Justice Truax recently found against the plaintiff's contention that the buildings are tenement-houses, and within the definition of the Act of 1867, where such houses are "taken to mean and include every house, building, or portion thereof which is rented, leased, let, or hired out to be occupied as the home or residence of more than three families living independently of one another and doing their cooking upon the premises, or by more than two families upon a floor so living and cooking, but having a common right to the halls," etc. Justice Truax says the words "tenement-house," as used in the covenant, are to be construed according to their plain, ordinary, and popular sense, and not according to the definition given in the Act of 1867. "A tenement-house, then" (in 1873), continues Justice Truax, "as well as now, had a well-defined meaning. When one says to-day that a person lives in a tenement-house, he does not mean that such person lives in a house like the Nevada flats, and yet those flats are occupied by more than three families living independently of one another and doing their cooking upon the premises."—*N. Y. Times*.

AN ANCIENT TEMPERED COPPER PICKAXE.—An extremely interesting relic of bygone ages has just been dug up on the shore of Lake Gogebic, a few miles east of Ironwood, Mich., by A. C. Hargraves, of that location. It is a pickaxe of tempered copper that had apparently been used in prehistoric times by people dwelling along the lake. The metallic part of the pick is 23 inches long and about half an inch thick. It tapers to a point at either end and is as finely tempered as a piece of tool steel. At the centre is a place where the tool was bound by thongs to a handle of wood. It is so hard that a steel file makes no impression on the copper. The art of tempering the red metal is unknown at the present day. Occasionally tempered copper knives have been dug up in this region, but this is the largest tool ever found.—*Boston Transcript*.





WHEATLEIGH. LENOX. MASS.

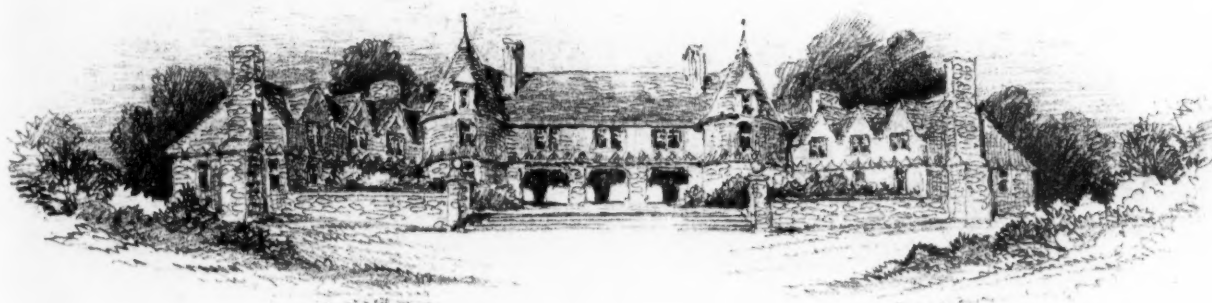
PRELIMINARY STUDY FOR "WHEATLEIGH;" HOUSE OF H. H. COOK, ESQ., LENOX, MASS.
PEABODY & STEARNS, ARCHITECTS.

The American Architect
April 6, 1902.
No. 1371.



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TENTATIVE SKETCHES FOR "WHEATLEIGH" H
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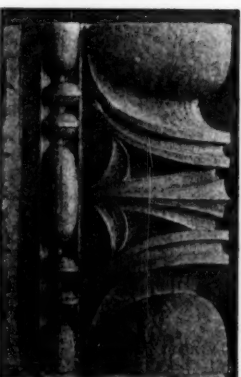
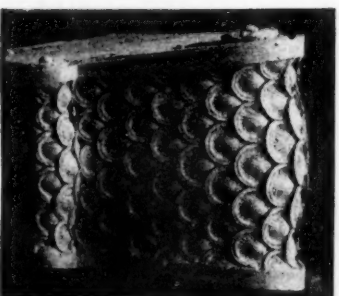
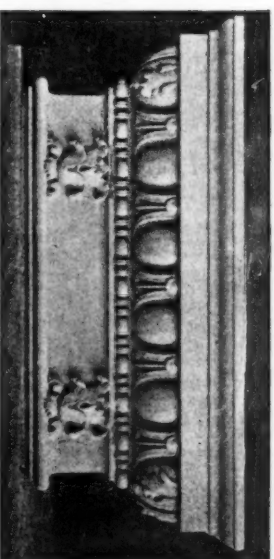
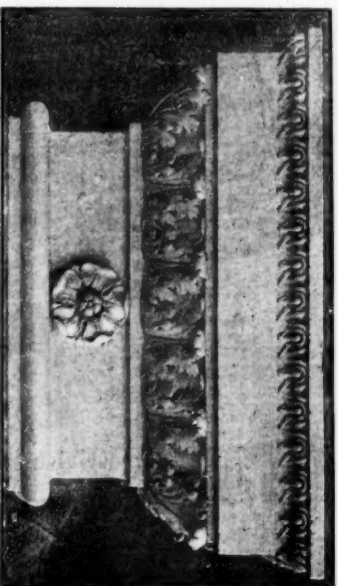
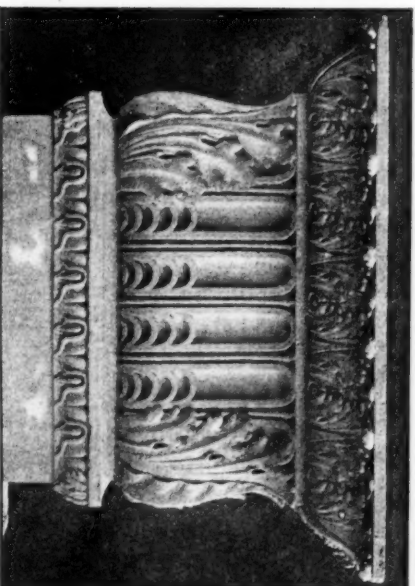
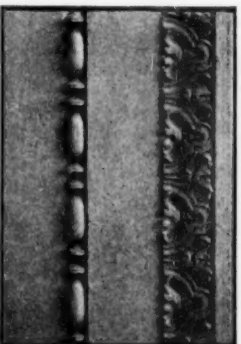
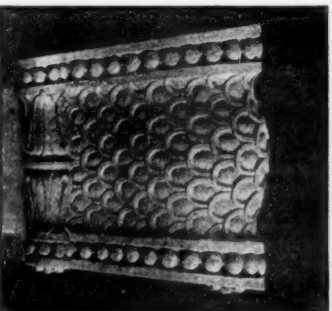
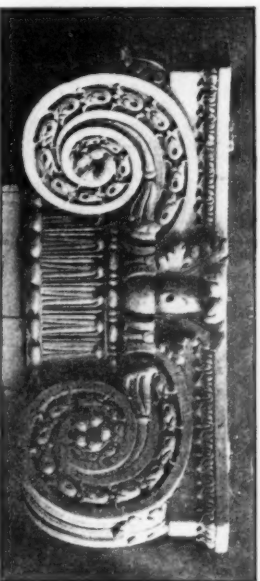
The American Architect
 April 5, 1902.
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From Schweizerische Bauzeitung

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STATUE OF "HELVETIA" IN THE ENTRANCE HALL OF THE UNION BANK, ZURICH, SWITZERLAND.
RICHARD KISSLING SCULPTOR.



THE AMERICAN ARCHITECT AND BUILDING NEWS

ADVERTISERS' TRADE SUPPLEMENT

No. 239

SATURDAY, APRIL 5, 1902

VOLUME LXXVI
No. 1371

THE AMERICAN HARDWARE CO.

THE final details have now been completed, and the P. & F. Corbin Co. and the Russell & Erwin Mfg. Co. can now be said to be successfully merged into the American Hardware Corporation. The formal details were completed at a meeting of the directors of the subordinate companies held in the office of the P. & F. Corbin Company, March 13.

The Directors of the American Hardware Corporation then met and elected the following officers:—

President, Hon. Philip Corbin.

First Vice-President, Charles M. Jarvis.

Second Vice-President, George J. Loughton.

Treasurer, A. J. Sloper.

Assistant Treasurer, Charles E. Wetmore.

Secretary, Theodore E. Smith.

Less than one-tenth of the stock of the subordinate companies remains as yet untransferred. This clearly emphasizes the disposition of the stockholders towards the merger, considering that scarcely two weeks had transpired since the announcement of the plan was sent out to the stockholders. The time-limit fixed at that time for the transfer of stock was April 1 and there is little room for doubt that by that day all the stock will have been exchanged for American Hardware.

The articles of incorporation have been filed with the Secretary of State and with the town-clerk, and from this date the affairs of the two companies will be conducted under the one head.

Hon. Philip Corbin, first Director and President of the American Hardware Corporation, joint founder of the P. & F. Corbin Company, of which he is President, was born in Willington, Conn., October 26, 1824. He is President of the New Britain Machine Company and Director in many of New Britain's industrial concerns. He is also prominent in the affairs of the South Church. His residence is Maple Street, New Britain.

Charles Maple Jarvis, third Director in the American Hardware Corporation and second Vice-President in this Corporation and the P. & F. Corbin Company, was born in Deposit, Delaware County, N. Y., April 16, 1856. He attended the public schools in Binghamton, N. Y., and later entered Sheffield Scientific School, from which he was graduated in 1887. He became Engineer of the Berlin Iron Bridge Company, then a small concern, doing \$20,000 a year business. Later he became its President and made the works indispensable to the trust, which was compelled to buy it. Mr. Jarvis resigned as Vice-President of the American Bridge Company to be

Vice-President of the P. & F. Corbin Company. His residence is Berlin Street, Berlin.

George J. Loughton is President of the Russell & Erwin Company. Mr. Loughton has been connected with the Company for forty years. He entered its employ in an humble position in the New York store and gradually worked his way up. When on the retirement of Henry E. Russell as President the Directors looked about them for a worthy successor they came to a unanimous agreement on Mr. Loughton. He has held this post for the past four years. Mr. Loughton's home is in Brooklyn, N. Y.

Andrew J. Sloper, the foremost representative of the Russell & Erwin Mfg. Co. in the merger, is generally and rightly referred to as a self-made man. He is President of the New Britain National Bank, to which position he worked himself by diligence and honest application to the best interests of his employers. He is a director in many of the city's leading business interests and is closely allied with the industrial prosperity of the community. He conducted in great part the Russell & Erwin end of the negotiations in the merger. Mr. Sloper is the State Senator from this district. His residence is on Grove Hill.

A GOOD CATALOGUE.

EVERY one knows that one of the most important groups of industries of the country, if not the most important of all, is that which is employed in the production and working of iron. In the consumption of the finished product the railroads hold the first place in the total tonnage consumed, for not only the rails have to be constantly renewed by the rolling-stock, but machine-shops consume a vast amount of material. After the railroads come the other great groups: ship-building and structural building, and then the minor industries.

The bulk of the total output is used by mankind in forms that are intensely utilitarian, but none the less brutally inartistic. That part of the metal that is used for tools and machines has a beauty of finish and perfection of arrangement and workmanship which excites the admiration of those who are skilled in such things, but it is a beauty rather of a scientific than an artistic kind.

It is only when we come to the minor uses to which iron can be put that we begin to discover how readily and naturally it lends itself to the production of forms that are artistically beautiful, and, roughly speaking, almost all of these forms of grace and beauty are designed

in connection with structural building-work, and are the product of the skill of the architectural designer or his fellow-worker the arts-and-crafts designer. How wide a field and how varied a range of subject iron in the hands of a skilled designer can be made to fill many people hardly realize, but should they happen upon the new catalogue just issued by the Winslow Bros. Company of Chicago they will find very pleasant information upon the subject in its two hundred and fifty pages of well-printed half-tone cuts, which show a few of the many artistic forms into which metal has been wrought by these skilled workers. We say "metal" because the catalogue exhibits not only work in cast and wrought iron, but in cast and wrought bronze as well.

Taken in alphabetical order, the catalogue exhibits illustrations of Andirons, Altar-railings, Balcony-railings, Bronzes, Bas-reliefs, etc., Bulletin-boards, Canopies, Capitals, Counter-railings, Drinking-fountains, Elevator-enclosures, Elevator-enclosure Doors, Elevator-cars, Entrance Doors and Gates, etc., Entrances, Fences and Gates, Finials, Eagles, Fire-screens, Fire-backs, Grills (wrought and cast), Lamps, Lanterns, Electroliers, Mausoleum Work, Memorial Tablets, Porch-railings, Radiator-screens, Safe-deposit Screens, Stairs, Stair-railings, Skylights, Statues, Signs, Store-fronts, etc.

THE WALKER BOILER.

It is one of the commonplaces of architectural practice for an architect to find, when he comes to consider the matter of heating his buildings, that the manufacturer of the heating-apparatus he inclines to select very often advises him to put in an apparatus a size or so larger than that which seems to be indicated by his calculations as being sufficiently powerful. Although the adoption of this advice brings safety with it so far as the actual provision of warmth is concerned, it also occasions to the owner not only a greater initial expense, but almost inevitably causes an undesirable and unnecessary increase in the total amount of his annual coal-bills.

From the new catalogue of the Walker & Pratt Mfg. Co., 31-35 Union Street, Boston, Mass., we learn that an architect, by using their apparatus, can avoid any misgivings and can secure a heating-apparatus that will do the required work and will not entail waste.

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(Continued on page 3.)

"The Georgian Period"

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The matter illustrated may in small part be classified thus:

PUBLIC BUILDINGS

City Hall, New York, N. Y.	Date 1803-12
Old State House, Boston, Mass.	" 1748
Pennsylvania Hospital, Philadelphia, Pa.	" 1755
Carpenters' Hall, Philadelphia, Pa.	" 1770
Independence Hall, Philadelphia, Pa.	" 1729
Faneuil Hall, Boston, Mass.	" 1741
and others.	

CHURCHES

King's Chapel, Boston, Mass.	Date 1749
Seventh-day Baptist Church, Newport, R. I.	" 1729
Christ Church, Alexandria, Va.	" 1767
Christ Church, Philadelphia, Pa.	" 1727
St. Paul's Chapel, New York, N. Y.	" 1764
Old South Church, Boston, Mass.	" 1729
First Church, Hingham, Mass.	" 1681
St. John's Chapel, New York, N. Y.	" 1803
First Congregational Church, Canandaigua, N. Y.	" 1812
St. Peter's P. E. Church, Philadelphia, Pa.	" 1758
Gloria Dei Church, Philadelphia, Pa.	" 1700
and others.	

IMPORTANT HOUSES

Fairbanks House, Dedham, Mass.	Date 1636
Royall Mansion, Dedham, Mass.	" 1737
Philipse Manor House, Yonkers, N. Y.	" 1745
Tudor Place, Georgetown, D. C.	" 179-
Mappa House, Trenton, N. Y.	" 1809
Woodlawn, Va.	" 1799
Mount Vernon, Va.	" 1743
and others.	

Incidentally there are shown special measured drawings or large views of the following features and details:

Porches and Doorways	67	Subjects
Staircases	21	"
Mantelpieces	81	"
Pulpits	6	"
Fanlights	60	"

In addition to the subjects enumerated above there is a large quantity of measured and detailed drawings of Cornices, Ironwork, Gateposts, Windows, Interior Finish, Ceiling Decoration, Capitals, etc., together with elevational and sectional views of entire buildings.

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We earnestly advise any intending traveller to read the above mentioned papers, most of which we can still supply.

AMERICAN ARCHITECT AND BUILDING NEWS CO.

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I. P. FRINK,
NEW YORK, N. Y.

NOTES.

In the estimation of George R. Brown, of Pittsburgh, who is identified with the American Bridge Company, it is a pretty big bridge that needs the construction of a special plant to build it. Well equipped as the American Bridge Company is, however, it is building a new plant to enable it to construct the new bridge over the Monongahela River which the Wabash Road intends to build, at a cost of \$1,000,000. "That is only a detail of the enormous improvements that are going on in and around Pittsburgh," said Mr. Brown at the Savoy recently. "The Wabash is spending nearly \$20,000,000 in terminals and road to make the Pittsburgh connection. An elevated road in the city is now projected, and there is a wonderful increase in the capacity of plants there. Pittsburgh is growing more rapidly than any interior city I know."

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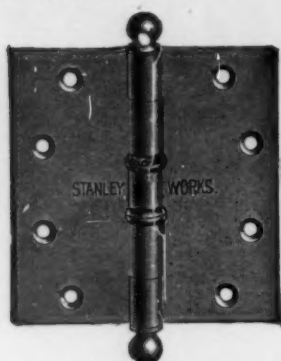
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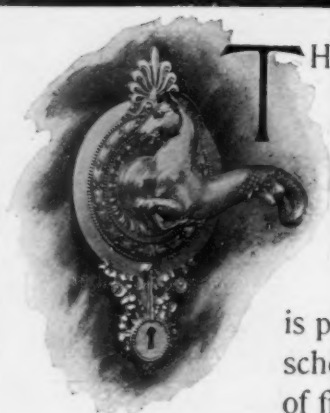
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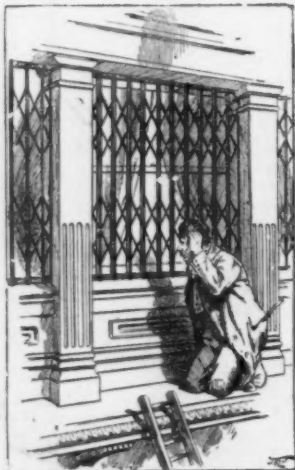
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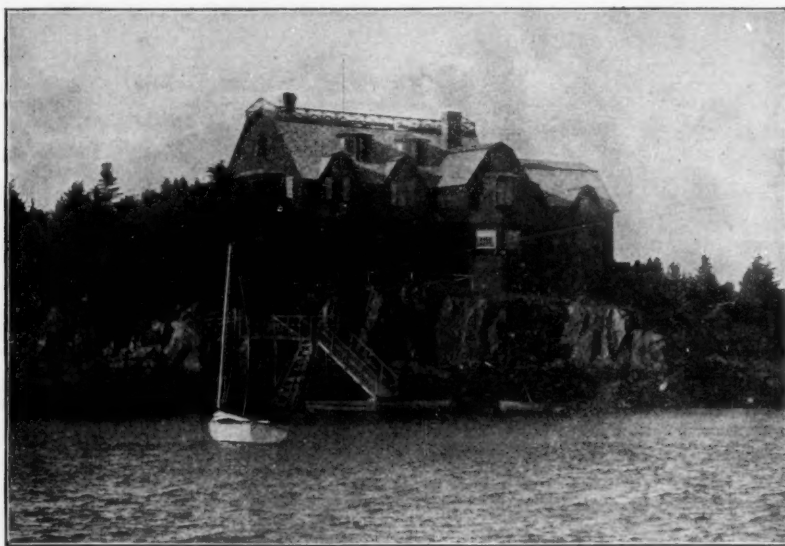
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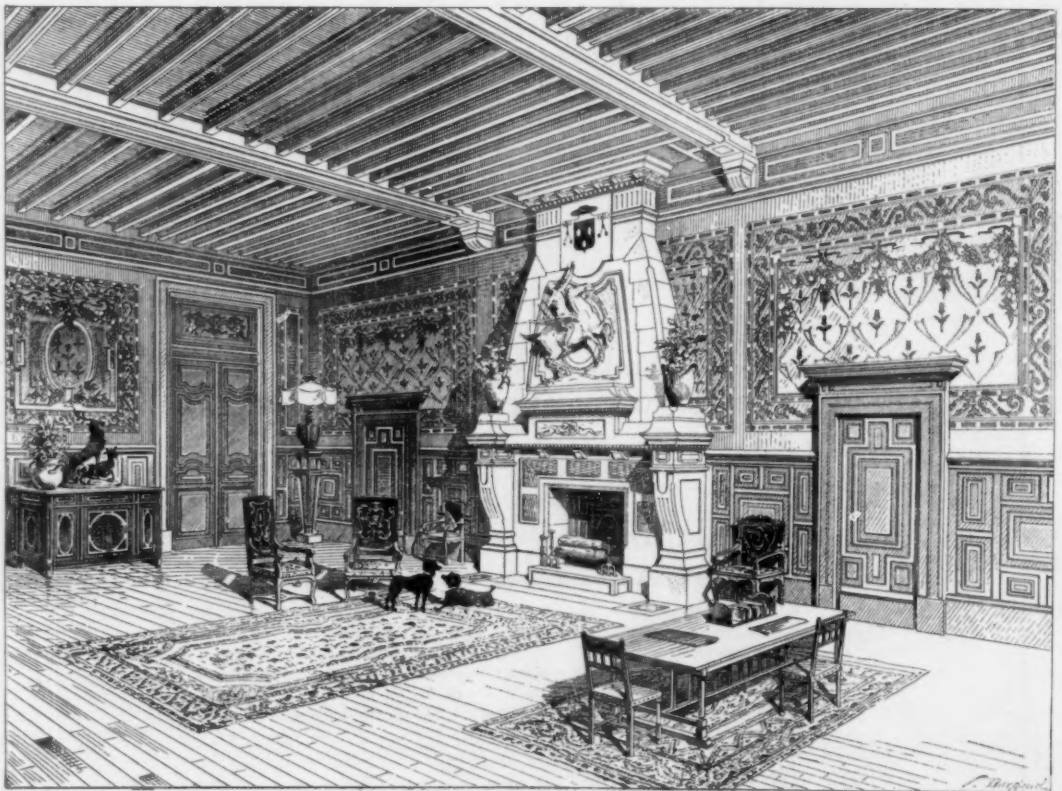
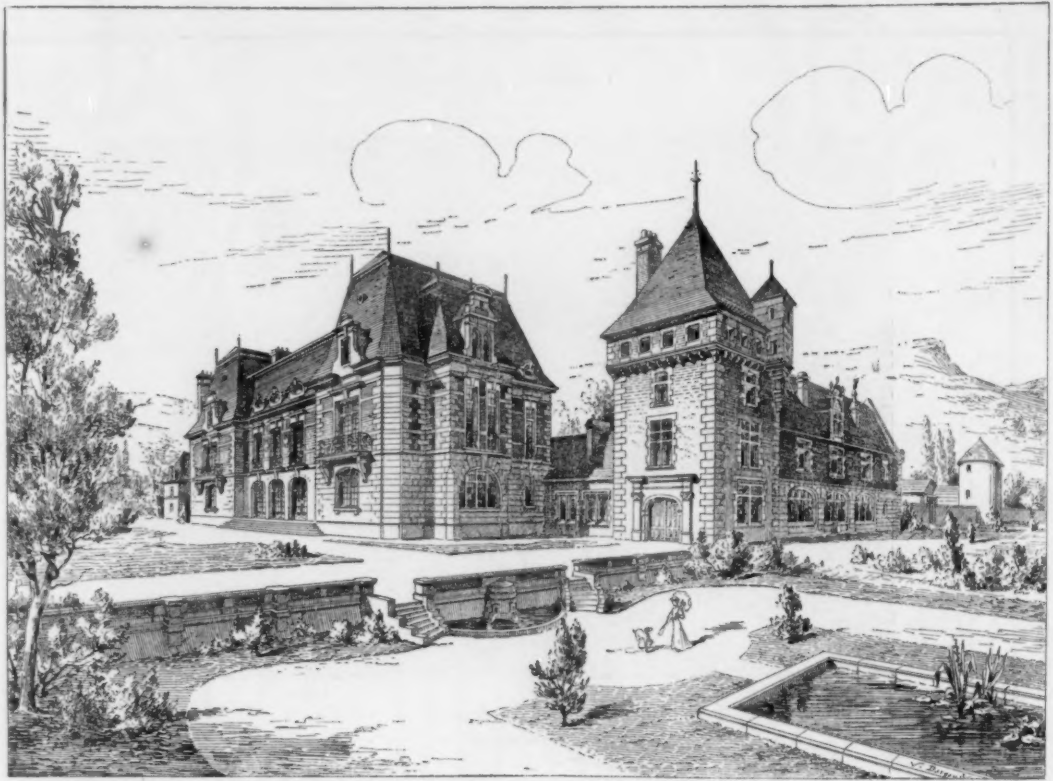
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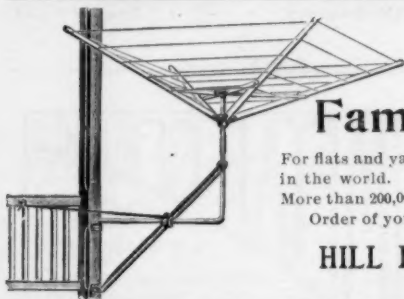
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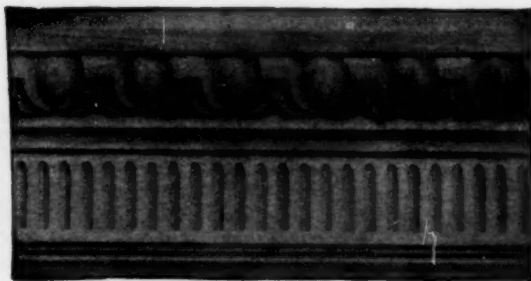


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THE KEASBEY & MATTISON CO., the owners of the patents for magnesia covering, have commenced a suit in the United States Circuit Court for the Southern District of New York against the Philip Carey Mfg. Co., George D. Crabbs, J. E. Breese, Schoellkopf, Hartford & Hanna Co., J. F. Schoellkopf, Jr., James Hartford, W. W. Hanna, C. P. Hugo Schoellkopf and Jesse W. Starr, to restrain the defendants from making and selling magnesia covering for boilers and steam pipes containing more than 50 per cent of magnesia, and especially coverings containing 85 per cent magnesia.

The Bill prays for a preliminary writ of injunction, to be continued during the pendency of the suit, and upon the final determination thereof to be made perpetual, and also demands an accounting and damages.

☞ All persons are respectfully requested to refrain from purchasing covering infringing these patents, as such purchasing must of necessity lead to suit. ☞

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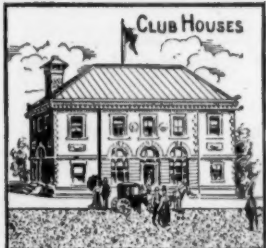
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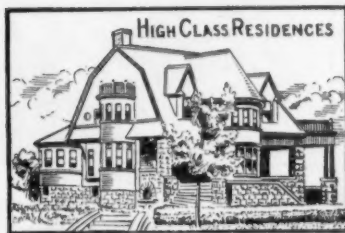
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HIGH CLASS RESIDENCES

BUILDING INTELLIGENCE.

(Advance Rumors Continued.)

Clark, 35 Wall St., New York, from plans to be furnished by A. J. Haydel, 156 Fifth Ave., New York.

New York, N. Y.—The Board of Aldermen has adopted a resolution appropriating \$300,000 for public baths in Boro. of Manhattan and \$100,000 for public baths in Boro. of Brooklyn.

Excavations are practically completed for the Hotel Astor, which, it is expected, will be ready for occupancy in the fall of 1903. The site is on the west side of Long Acre Sq., including the block from 44th to 45th St., and extending 162 feet down each street. The area covered by the structure will be 33,000 square feet of ground. The architects, Messrs. Clinton & Russell, plan a facade in the style of the modern Renaissance, of limestone and red brick, crowned with a high curved mansard roof of slate and copper, with stone dormers. The entrance will consist of three covered arches, three stories in height, opening on a platform 100 feet in length. The building will have two stories below the curb and ten above it.

Plans have been drawn for a twelve-story business building to stand on a plot, 102' x 105', at the southeast corner of 28th St. and Broadway. The property is owned by Mrs. C. M. Johnston.

The Borden Condensed Milk Co. has bought the property at the northeast corner of Franklin and Hudson Sts. The three-story and the two-story brick buildings which now occupy it will be torn down and a large building erected.

Holdridge & Ward have leased for the Charles Frederick Hoffman estate the property recently bought by the estate at the southwest corner of 6th Ave. and 32d St. They leased the property for 21 years to a party who will probably erect a new fireproof mercantile building. Mr. Phillips, an attorney, represented the lessee.

S. Osgood Pell & Co. have sold to Charles A. Gardiner, counsel for the elevated railroad, No. 581 Fifth Ave., a five-story brownstone house adjoining the home of Miss Helen M. Gould at the northeast corner of 47th St. and 5th Ave. The house will be remodelled and occupied by the owner as his home.

Plans have been filed for a four-story brick stable to be erected on the north side of 58th St., near 7th Ave., for Miss Helen M. Gould, York & Sawyer, 156 Fifth Ave., architects. Estimated cost, \$25,000.

BUILDING INTELLIGENCE.

(Advance Rumors Continued.)

A five-story brick theatre is to be erected on Central Park West, from 62d St. to 63d St. The Jai Lal Ball Co., of 10 Arlington Pl., Brooklyn, is the owner, and the building will be used by them as a court to play the Cuban ball-game known as Jai Lal. Plans by I. B. McElfatrik & Son; cost, \$175,000.

Col. Oliver H. Payne will build a house on the 5th Ave. plot which he gave to his nephew Payne Whitney and Miss Helen Hay on their wedding day, February 6th. It is the Cook plot, between 78th and 79th Sts., and it is said that the value of this wedding gift will be about \$1,250,000.

Niagara Falls, N. Y.—Mrs. James Hayes will erect a \$60,000 flat building on 3d St., near Ferry Ave.

Oakland, Cal.—Bertrand E. Taylor, 87 Milk St., Boston, Mass., has drawn plans for the new Merritt Hospital to be erected on Hawthorne and Dwinelle Sts.

Omaha, Neb.—Thos. R. Kimball, McCague Building, has made plans for the Methodist Hospital buildings to be built at 36th and Cuming Sts. The main building and the power plant will cost \$100,000.

Peoria, Ill.—Plans have been drawn by Herbert Edmund Hewitt, 14 Arcade Building, for a three-story business block at Jefferson and Liberty Sts., for W. H. Hoagland, El Paso, to cost \$30,000.

Philadelphia, Pa.—Sol Greenberg, contractor and builder, is to convert George D. Widener's former residence, 1202 N. Broad St., into a modern apartment-house. Work to begin about April 1. Two stories will be added to the present brownstone residence, and a six-story rear addition will be built, extending the full length of the lot. The work will cost about \$40,000. Willis G. Hale, architect.

Bauer & Snyder have been granted a permit for a large building operation at 13th and Venango Sts. Twenty-one two-story brick dwellings, each 15' x 39', will go up on the west side of Camac St., above Venango; 6 two-story brick dwellings, 16' x 29', on the north side of Venango St., below 13th; 1 brick store and dwelling, 16' x 44', at the northwest corner of Camac and Venango Sts., and another store and dwelling, 16' x 50', at the northeast corner. The cost of the entire operation will be \$49,600.

Doyle & Doak have received plans from John T.



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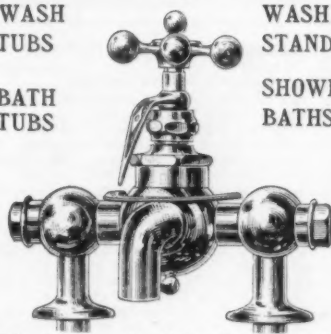
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BUILDING INTELLIGENCE.

(Advance Rumors Continued.)

Windrim, architect, for the structural steel, cast-iron, stone, concrete work and fireproof floors for John Wanamaker's new building at the southeast corner of Juniper and Market Sts. The complete plans for the entire building have not yet been made public.

Appleton & Burrell will build a one-story brick glass factory, 41' 5 1/2' x 63', and a three-story laboratory and office-building, 35' x 76', on Roberts Ave., above Wayne Ave., for Max Levy. Carl P. Berger designed the structures, which will cost \$20,000.

Plans and detailed specifications have been completed and estimates are invited by Baily & Truscott, 421 Chestnut St., for a residence to cost about \$20,000. It will be a three-story stone building having all conveniences.

The Charles McCaul Co. has filed plans with the Bureau of Building Inspection for a four-story addition, 26' x 101', to the Bell Telephone Co.'s branch station at the corner of 17th and Poplar Sts.; cost, \$46,000.

The negotiations are in progress for the sale of the Young Men's Christian Association Building at the southeast corner of 15th and Chestnut Sts., to a syndicate of New York and New England capitalists. It is understood to be the intention of the purchasers to erect a large modern hotel on the site. As to the future home of the Young Men's Christian Association, nothing definite has been decided, and no committee has yet been appointed to investigate the eligible sites in the central portion of the city.

Ground has been broken for the new annex to the Samaritan Hospital, Broad and Ontario Sts., under the supervision of Contractor J. Sims Wilson. The annex will be 85' x 106', three stories high. In addition there will be erected a one-story building, 50' x 50', as an administration, reception, office and clinic building.

J. G. Stuckert & S. have sent out plans for the new building for the Calvary Baptist Church at 7th St. and Snyder Ave. It will be two stories high, of brick, 20' x 78', in the Romanesque style of architecture.

Report states that Tuttleman Brothers & Faggin, shirt manufacturers, will make large additions to their plant at the corner of American and Jefferson

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BUILDING INTELLIGENCE.

(Advance Rumors Continued.)

Sta. The building on the adjoining property on American St. will be torn down and a six-story brick structure will be erected there, and 3 more stories will be added to the present factory. Architects Hahn & Hallinger have drawn the preliminary sketches. Estimated cost, \$60,000.

William T. B. Roberts has been granted a permit for an operation of 83 dwellings on Greene, Marion, Knox and Hansbury Sts., Germantown. They will all be two-story brick structures. A. Allen Wilson is the architect, and the total cost of the operation will be \$208,400.

Bowman & Stubing have been granted a permit for a large building operation on Arch and Race Sts., below 52d St., and on 52d St., between Arch and Race Sts. Sixty two-story brick dwellings will be erected, averaging 16' x 57'. Total cost, \$127,300.

Architects Newman, Woodman & Harris have awarded to J. H. Mahon, of Ardmore, the contract for Major General John R. Brooke's residence to be built at Rosemont. The work will cost about \$15,000.

Pittsburgh, Pa.—It is reported that plans have been prepared by the Pittsburgh, Fort Wayne & Chicago Ry. Co. for a new freight station to be erected on 11th St. and Penn Ave., at a cost of \$100,000. Thos. Rodd, ch. engr.

It is reported that plans are being prepared for the erection of a \$100,000 church for St. Edward's Catholic Society at 8th and York Sts.

The George A. Fuller Co., 1027 Marquette Building, Chicago, Ill., has been awarded the contract for erecting the twenty-five-story Oliver office-building in Wood St. Approximate cost, \$2,000,000.

Plans have been made for an eight-story paint and varnish factory, to cost \$150,000, to be erected on W. Carson St., for W. W. Lawrence & Co.

Pittsfield, Mass.—Plans have been completed for the erection of a modern \$100,000 hotel here if the citizens will take stock. The attempt made last year to induce Raleigh people to build such a hotel failed utterly.

Portland, Me.—Report states that a city almshouse is to be erected on Brighton Ave. and Riverside St., to cost about \$100,000. Plans by F. H. and E. F. Fassett, 33 Exchange St.

Raleigh, N. C.—It is reported that Norfolk people propose to build a modern \$100,000 hotel here if the citizens will take stock. The attempt made last year to induce Raleigh people to build such a hotel failed utterly.

Richmond, Va.—It is said that a big steel plant with Mr. A. B. Clarke, former president of the Old Dominion Iron Works, at its head, may start up here soon. The belief is that the capital for this proposed enterprise is to come from the North. The Old Dominion works were recently bought by the Williams syndicate here.

The West Hampton Railway & Development Co. have had plans made by D. W. Anderson, 920 E. Main St., for a brick and frame casino building, 95' x 125', to cost \$20,000, and a \$5,000 amphitheatre building, to be built in W. Hampton Park.

Fuller Chaplin, New York City, has prepared plans for a \$40,000 theatre, to be built by Jake Wells, to replace the Bijou Theatre.

Rosemont, Pa.—Plans for a three-story brick and stone residence, to cost \$25,000, have been drawn by Bailly & Truscott, 421 Chestnut St., Philadelphia.

Salt Lake City, Utah.—Architect Hill has prepared plans for a \$25,000 school to be erected on 1st and A Sts. by the Mgr. of Rowland Hall.

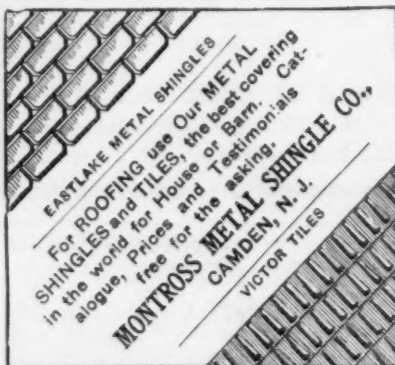
Seattle, Wash.—De Nurf & Heide have prepared plans for a ten-story office-building to be erected by J. D. Lowman on 1st Ave. and Cherry St., to cost about \$200,000.



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BUILDING INTELLIGENCE.

(Advance Rumors Continued.)

Sioux City, Ia.—Plans have been completed for a depot to be erected on Nebraska St. for the Chicago & Northwestern R. R., to cost \$100,000.

Spokane, Wash.—The erection of a steel bridge across Hanymans Creek is contemplated; cost, \$100,000.

Springfield, Mass.—Plans by Architect James A. Clough, of Holyoke, are being figured for the new three-story building, 80' x 105', to be erected at the corner of Temple and Maple Sts. for Dr. H. W. Van Allen. It will be of red brick, with limestone trimmings and gravel roof; cost, \$75,000.

St. Cloud, Minn.—The local secret orders contemplate erecting a lodge building to cost \$25,000.

St. Paul, Minn.—About \$20,000 will be spent in rebuilding the Davidson Block at 4th and Jackson Sts., which was destroyed by fire on January 27.

Aldis, Aldis & Northcote, Monadnock Block, Chicago, E. G. Walton, Minneapolis, and Luther Cushing, St. Paul, are interested in an \$80,000 office-building, which will be erected at 2d Ave. and 4th St. Structure will be 60' x 133', three stories high and will be modern in all respects.

J. J. Wangenstein has drawn plans for a four-story and basement brick store building for S. Loeb, to be located at Lake Ave. and Michigan St.; cost, \$30,000.

Strawberry Point, Ia.—Necott & Donnan, architects, of Independence, have plans for a hotel and business block to be erected here. Will be three-story, 90' x 96', brick; cost, \$25,000. Byron Newberry is interested.

Struthers, O.—The Youngstown Manufacturing Co. propose building a rolling mill near here, to cost \$100,000.

Trenton, N. J.—The Senate has passed the bill appropriating \$125,000 for the extension of the State-house grounds, and providing for an executive mansion.

Washington, D. C.—Plans have been submitted by different architects for the new municipal hospital.

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BUILDING INTELLIGENCE.

(Advance Rumors Continued.)

A number of architects from those submitting plans originally have been selected and they will submit final competitive plans.

Wausau, Wis.—St. Stephen's Lutheran congregation will erect a brick and stone church to cost \$40,000.

West Manchester, N. H.—From plans by Architects Wheelwright & Haven, 100 Boylston St. Contractors Roberts & Hoare, of Manchester, have the contract to build a fine stable, 40' x 50', for Eben D. Jordan. All modern improvements. Cost, about \$20,000.

Woonsocket, R. I.—Preparations are being made by St. Aloysius parish for the erection of a new brick church on the corner of Rathbun and George Sts. It will cost between \$40,000 and \$50,000.

Worcester, Mass.—A \$200,000 theatre is to be built here on Main and Southbridge Sts., to seat 2,000 persons.

COMPETITIONS.

SCHOOL.

[At Milwaukee, Wis.]
The Board of Public Works will receive, until April 18, competitive sketch plans and outline specifications for the construction of a public school on 37th St., between Walnut and Roberts Sts., cost complete not to exceed \$55,000. Chas. J. Poetsch, Comr. of Pub. Wks. G. W. PORTH, Deputy Compt. 1371

PROPOSALS.

BANK.

[At Jasper, Tex.]
Bids will be received by K. B. Scale until April 15 for the erection of a one-story brick bank building at Jasper. 1371

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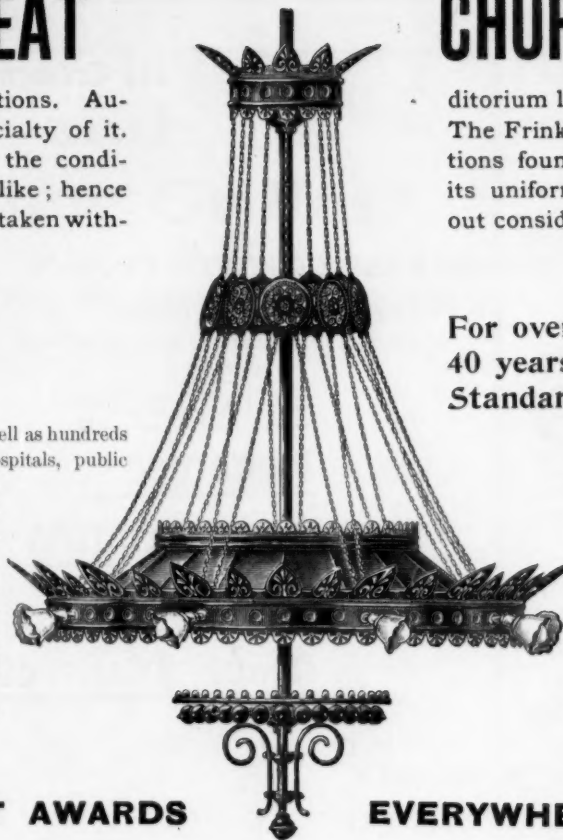
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PROPOSALS.

WATER AND SEWERAGE SYSTEM, AND TOWN-HALL.

Bids for the construction of a \$25,000 system of waterworks, \$15,000 sewerage system and \$10,000 town-hall will be received by the mayor or clerk of Jennings, La., until April 15. For further particulars address, H. H. HOAG, clerk. 1371

BRIDGES.

The County Auditor wants bids until April 22 for the construction of 12 small steel bridges. SAMUEL DOAK, Chairman Board of Adams County Commissioners. 1372

SEWER SYSTEM.

The county engineer will receive sealed bids until April 28 for completing the general sewer system. Probable cost, \$51,000. 1373

PORTLAND CEMENT, ETC.

U. S. Engineer Office, Winthrop Building, Boston, Mass. Sealed proposals for furnishing Portland cement, sand and broken stone will be received here until April 28, 1902. Information furnished on application. HARRY TAYLOR, Capt. Engrs. 1374

COURT-HOUSE.

Bids are wanted until April 15 for the erection of a court-house. WILFRED W. BEACH, archt., Sioux City. 1371

PIPE SEWERS.

Sealed bids are wanted until April 15 for 6 to 24-inch pipe sewers, to cost in the neighborhood of \$60,000. W. J. PARKS, city engineer. 1371

COURT-HOUSE.

Sealed bids are wanted until April 16 for the

PROPOSALS.

erection of a fireproof court-house in this parish. C. H. BROOKS, secretary police jury, Arcadia parish, Crowley, La. 1371

COURT-HOUSE.

Bids are wanted by the Wilkes Co. Comrs., R. D. Callaway, Chmn., until April 15 for the erection of a new court-house. Architect, Frank P. Hilburn, of Columbia, S. C. 1371

TOWN-HALL.

Bids are wanted April 15 for the construction of a town-hall. WILBERT REED, Chmn. Bldg. Com. 1371

JAIL.

The county ordinary will receive bids until April 15 for the erection of a jail. J. W. GOLUCKE & CO., architects, Temple Court, Atlanta. 1371

COURT-HOUSE.

Sealed bids are wanted until April 11 for the erection of a court-house. J. B. COBURN, Chairman of Board. 1371

APARTMENT-HOUSE.

Bids are wanted for the erection of the Rhodes-Taylor apartment-house, to be built on 14th St., at a cost of \$50,000. E. B. FRANZHEIM, 45 Twelfth St., architect. 1371

HOSPITAL.

Bids are wanted April 14 for the erection of a hospital in Winnipeg. FRED. GELINAS, Sec'y Dept. Pub. Wks., Ottawa, Ont. 1371

HEATING.

Bids are wanted April 13 for furnishing heating apparatus complete in place for the U. S. Post-office

PROPOSALS.

at Oskaloosa, Ia. JAS. KNOX TAYLOR, Supervising Archt., Treasury Dept., Washington, D. C. 1371

LUMBER.

U. S. Engineer Office, Custom-house, Norfolk, Va. Sealed proposals for furnishing and delivering pine piles, creosoted pine piles, yellow pine lumber and creosoted yellow pine lumber at Ft. Monroe, Va., will be received here until April 17, 1902. Information on application. 1371

NOTICE TO CONTRACTORS.

COURT-HOUSE.

Sealed proposals will be received at the office of the County Controller, of Westmoreland County, Greensburg, Pa., until 12 M., April 17th, 1902, for the erection and completion of the superstructure of the new court-house for Westmoreland County, at Greensburg, Pa., in accordance with the drawings and specifications prepared by William Kauffman, architect, Lewis Building, Pittsburgh, Pa. Bids will be received for structure to be of stone, or granite casing. Plans and specifications can now be seen at the office of the commissioners, Greensburg, Pa. All proposals must be accompanied by a certified check equal to ten (10) per cent of the amount of bid. The Board of Commissioners reserve the right to reject any or all proposals. All proposals must be securely sealed with wax, and the name or initials of the bidders stamped thereon. JOHN H. BROWN, controller. 1371

CHURCH.

The undersigned hereby gives notice that sealed proposals for the erection of St. Matthew's Evangelical Lutheran congregation at Fernando, Minn., including all labor and material, will be received by building committee until the 12th day of April, 1902. All bids must be in strict accordance with the plans and specifications, prepared by Charles E. Webster, of Winthrop, Minn., which may be seen at the

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office of the <i>Improvement Bulletin</i>, Minneapolis, and on application at the office of Charles E. Webster and Henry Proehl, Fernando, Minn. (Signed) HENRY PROEHL, F. W. ROSE, FRED. F. FENSKE. 1371 BUILDING. [At Port Townsend, Wash.] Bids are wanted April 14 for a laundry building and machinery at the U. S. Quarantine Station, Port Townsend. JAS. KNOX TAYLOR, Supervising Archt., Treasury Dept., Washington, D. C. 1371 NOTICE TO CONTRACTORS. STATE CAPITOL BUILDING. [At St. Paul, Minn.] Sealed proposals in duplicate will be received at the office of the Board of State Capitol Commissioners, No. 512 Endicott Bldg., St. Paul, Minn., until Tuesday, May 6th, 1902, at 12 o'clock noon, for all labor and material required for the plastering, the ornamental iron; also until Tuesday, June 3d, 1902, at 12 o'clock noon, for the woodwork, the painting and glazing; also until Tuesday July 1st, 1902, at 12 o'clock noon, for the hardware; also until Tuesday, October 7th, 1902, at 12 o'clock	noon, for the interior stone and marble work. (Proposals for each class of work separately.) For the new State Capitol Building at St. Paul, in accordance with the drawings and specifications, which may be seen at the office of the Board and at the architect's offices on and after Monday, March 17th, 1902. Copies of said drawings and specifications may be obtained from Cass Gilbert, architect, No. 524 Endicott Building, St. Paul, Minn., or Room 704 Constable Building, 111 Fifth Ave., New York City, upon payment of the cost of such reproductions, and a deposit of \$100, such deposit to be returned to the bidder upon return of the drawings and specifications. Certified checks must accompany bids, as follows: on plastering, \$1,500; on ornamental iron, \$1,500; on woodwork, \$1,000; on painting and glazing, \$1,000; on hardware, \$500; on interior stone and marble work, \$2,500; payable to the order of said Board, as a guarantee of good faith. The right is reserved to reject any and all bids and to waive any defect or informality in any bid, if it be deemed in the interest of the State to do so. Proposals received after the time stated will be returned to the bidders. Proposals must be made in duplicate and on printed forms, which will be furnished by the Board, and must be enclosed in envelopes, sealed and marked "Proposals for (name class of work bid upon) the new Minnesota State Capitol at St. Paul," and addressed to the Board of State Capitol	Commissioners. For the Board of State Capitol Commissioners. CHANNING SEABURY, Vice-president. St. Paul, Minn., March 15th, 1902. 1372 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

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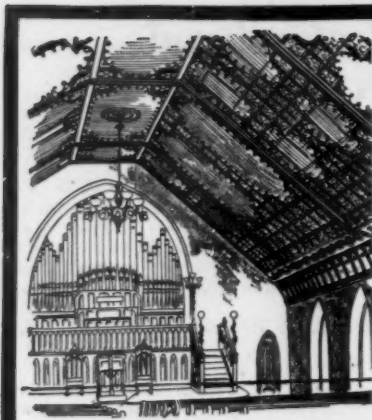
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