



SUMMARY:—

The "Fireproof Wood" and Metal-covered Wood Question. — Death of Alexander R. Shepherd, Redeemer of Washington. — Pollution of Chicago's Water-supply. — Projected Reorganization of the Quincy Granite Quarries Co. and the American Bicycle Co. — The Rebuilding of the Tower of St. Mark. — German Insurance against Loss through Strikes. — International Competition for a Church at Patras, Greece. — Tunnelling the Gemmi Pass, Switzerland. 89

NOTES ON IRON AND STEEL CONSTRUCTION. — X. 91

ILLUSTRATIONS:—

A Competitive Design for the Boston Athenæum, Boston, Mass. — Elevation and Section of the Same. — A Competitive Design for the Boston Athenæum, Boston, Mass. — Villa of the Herren Kalmbach, Munich, Bavaria. — Additional: House of Dr. A. Coolidge, No. 487 Commonwealth Ave., Boston, Mass. — House of Thomas Lockwood, Esq., No. 111 Bay State Road, Boston, Mass. — University of Pennsylvania Dormitories, Philadelphia, Pa.: Grotesques; — Arcade to Small Triangle. — Some Entrances: University of Pennsylvania Dormitories, Philadelphia, Pa. — Details: University of Pennsylvania Dormitories, Philadelphia, Pa. 95

COMMUNICATION:—

"When do Building Operations begin?" 95

NOTES AND CLIPPINGS. 95

THE *Engineering News* makes some very sensible comments on the tests of fireproof wood recently made at the Insurance Engineering Experiment Station in Boston. These tests showed that the material so named is very far from being fireproof, and that, at best, it simply ignites more slowly, and goes out sooner, when the source of heat is removed, than untreated wood. The officials of the Experiment Station do not think that these qualities give the fireproof material much superiority over ordinary wood, and it is true that, if a conflagration should start in a building, little difference would probably be observed in behavior between treated and untreated wood; but, as the *Engineering News* well says, a material which does not catch fire easily may be of great use in construction, even though incapable of sustaining intense heat. Mr. Atkinson, in commenting on the report of the Experiment Station, describes the best fireproof door as one of wood, covered with tin. He could not seriously expect the owner of a hotel or office building, dependent for tenants in a great degree upon the appearance of his rooms, to equip it with doors covered with sheets of tin; and the report would probably have met with more favor among those for whose benefit it was intended if it had pointed out that it is not at all necessary to choose between inflammable doors, or wainscoting, and the tin-covered woodwork familiar in boiler-rooms and coal-bins, American enterprise having for some years furnished doors and panelling of wood, completely covered with metal, as neatly and richly moulded as solid woodwork; while several hundred American architects stand ready, whenever called upon, to develop this construction into unheard-of beauties. In fact, the treatment of metal-covered wood fittings of this sort, in bronze or brass, modelled, chased or otherwise ornamented, offers a wide field of beautiful effects, and there is no question that woodwork so protected is, or can be made, quite as fireproof as the ordinary combination of boards and roofing-tin. It would be more expensive, but that is not a very serious matter in costly buildings, and it might be possible to rub a pine door over with black-lead, and electroplate it with copper or brass in a continuous covering, at a comparatively moderate cost.

ONE of the most energetic and most heartily berated men whose activity occupied the attention of the last generation was Alexander R. Shepherd, formerly Governor of the District of Columbia. Soon after the Civil War, Shepherd, then a young plumber in Washington, became conspicuous as a politician, and gradually made his way to the proud title of "Boss." At that time the city of Washington was little more than a filthy swamp, with a few magnificent public buildings scattered about in it. There is a story that some people, during the

Civil War, excavating in Pennsylvania Avenue, came across a regiment of soldiers, which had attempted to march up the Avenue, but had been engulfed in the mud. Assistance was summoned, and the soldiers were dug out, but, on being liberated, they besought the workmen to continue their labors, as there was another regiment underneath. Even supposing this tale to be exaggerated, there was plenty of truth in the accounts of the filth and malaria of Washington which were carried North by returning soldiers and officers, and led to a serious movement to have the capital of the nation transferred to some more civilized city. Just at this time President Grant, who loved energy, had occasion to appoint a new Governor of the District of Columbia, and Shepherd, who had been for two years Vice-President of the Board of Public Works of the District, and had introduced various improvements, seemed to him a suitable man for the post. Notwithstanding the opposition of the citizens, he was appointed, and entered at once upon a career of what seemed to the taxpayers wild extravagance. In a little over two years he spent forty million dollars in pavements, sewers, public buildings and other improvements, and saddled upon what was then a town of very small resources a debt of twenty-seven millions. At the end of his term of office he retired under a storm of execrations from the citizens of Washington and from the newspapers of the country, which accused him not only of mad extravagance, but of corruption; few, if any, having the foresight to comprehend the great work which he had accomplished for his native city. The charges of corruption were not sustained, and probably had no foundation. The Governor, on retiring from office, went back quietly to his plumbing business, in which, after some vicissitudes, he saved up a little capital, and went to Mexico, in the interest of some of his friends, who had confidence in his judgment. Joining their resources with his own, he bought the old Batopilas silver mines, and established himself permanently as manager. Under his direction the enterprise prospered, enriching both his friends and himself. Meanwhile, Washington, which had been converted by his energy, and against bitter opposition, from a dull, straggling Southern town into the promise, at least, of a great and splendid city, has begun to fulfil the anticipations which he alone seems to have been capable, thirty years ago, of forming for it, and it may be hoped that among the future attractions of what seems destined to be the most beautiful city in the world, some memorial to the much-maligned Governor Shepherd may not be forgotten.

THE practice of throwing city sewage into a fresh-water lake, and pumping drinking-water out of the same lake, a few miles beyond the sewer outlet, is again producing its legitimate result in Chicago. Although the Chicago River no longer pours its reeking floods into Lake Michigan, but sends them, instead, toward St. Louis, a portion of the sewage of Chicago still finds its way to the Lake, and there, instead of being immediately purified and rendered harmless, is so ill-advised as to creep into the water crib, to be pumped, mixed with drinking-water, into the houses of the city. A week or two ago, there were three hundred and twenty-seven typhoid patients in the County Hospital alone; and the use of the city water has proved so dangerous that the drinking fountains in the schoolhouses have been shut off. Whether anything can be done to remedy the trouble remains to be seen. We may confess that our sympathies are not greatly excited by the failure of schemes for throwing the sewage of great cities into lakes or rivers, to poison people, when it might, instead, be converted, by irrigation, into flour, and beef, and potatoes, and wool to feed and clothe them; but every one must deplore the immediate results of the mistake. Fortunately, Chicago is rich, and enterprising, and intelligent, and it will not look on very long at the decimation of its population by a bad water-supply without devising some remedy.

A CURIOUS distemper has broken out among the "industrial combinations" which, as we are so frequently told, have permanently revolutionized methods of production. A day or two ago, the Quincy Granite Quarries Corporation, formed by the combination of the principal quarrying firms at

Quincy, and professing to be the largest producer of granite in the world, defaulted the interest on its bonds. The newspapers explained this circumstance by saying that it was part of a plan for "securing new working capital"; that the business was profitable, but additional working capital was needed, and that, to obtain this, a reorganization was to be effected, under which a large additional issue of bonds was to be made, bearing high interest, and rendered attractive to purchasers by a bonus of new preferred and common stock. Presumably, in order to effect this reorganization, it would be necessary to foreclose the existing bonds, and it might be inferred that the default of interest was made purposely to give occasion for this. Meanwhile, the people who hold common and preferred stock in the present company, which will be cut off by foreclosure, are likely to view the proceedings with a certain interest. Undoubtedly, they will be given the right to take new stock, upon certain terms; but the suggestion naturally presents itself that the holders of the defaulted bonds are legally entitled, if they choose, to sell at auction, under foreclosure, all the assets of the corporation, to satisfy their claim, without troubling themselves about the interests of the preferred and common stockholders; and that, if they have concluded, at present, to give the stockholders a chance of saving some of their property, for the sake of inducing them to subscribe to the increased issue of bonds, there seems to be no reason why the same process should not be repeated wherever new "working capital" is needed.

IT is a little singular that a corporation composed of a number of prosperous concerns should, in a time of general activity, and high prices, need more "working capital," but the same condition of things, it appears, afflicts also the American Bicycle Company, a combination, as we need hardly say, of the principal bicycle manufacturers of the United States, and, in order to obtain the funds which it needs to "carry on" its prosperous business, this corporation has also made default upon its bonded indebtedness, and is, we are told, to be reorganized on the basis of a still larger indebtedness, and still further sacrifice of the value of the stock. Probably, in both these cases, the stockholders are also, in most cases, bondholders, and the reorganization is, practically, a rearrangement of the financial plan of the corporation, perhaps intended only to give the bondholders a larger interest on their property; but it must be confessed that "deals" of this kind, whether in the interest of "insiders" or not, are not likely to attract the public toward investment in either the stock or the bonds of such corporations. Apart from this, however, the fact that industrial combinations, even when prosperous, seem to feel a chronic need of money is of importance. It is said by some manufacturers that the claim put forward in advocacy of industrial combination, that economy and efficiency are promoted by it, is not well founded; and that manufacturing operations are never so economically and efficiently conducted as when they are controlled by one man, thoroughly familiar with all the details of the business. It seems as if there might be reason in this, but if the difference in economy is so great that a combination of establishments, which had each been carried on profitably by one man, is likely to find itself, within a few years after competition has been eliminated by consolidation, unable, even in times of general prosperity, to pay the interest on its mortgage bonds, the student of industrial conditions, as well as the humble investor of his own or other people's savings, would be glad to know more about the matter.

AS we expected, Professor Boni has ascertained that the foundations of the fallen Campanile at Venice are perfectly sound, and that the superstructure can be rebuilt upon them without danger. The cost of rebuilding is now estimated at six hundred thousand dollars, or half the sum which, as the newspapers reported, the Venetian Government thought would be necessary. We are inclined to think that the last estimate is at least twice too high; and, as three hundred thousand dollars are said to have been already subscribed, it is not surprising to hear that the work is to be begun without delay.

A NEW agency in the industrial world has been established in the formation of two companies, one in Germany, and the other in Austria, for insuring manufacturers against loss through strikes. The Austrian company, which seems to have the most radical and comprehensive programme, is to be

a mutual one, composed of two hundred and fifty manufacturers, having an annual pay-roll of not less than five million dollars. In case of an "unjustifiable strike" in the establishment of any member of the company, one-half the amount of the regular pay-roll of the establishment will be paid to its owners, out of the reserve fund of the company, so long as the strike continues, if it does not last more than three months; but indemnity will not be paid for more than three months on account of any one strike, nor for more than six months in any one year; the obvious intention of this regulation being to stimulate policy-holders to adjust their labor troubles quickly, and to maintain an attitude toward their employés sufficiently conciliatory to avoid frequent controversies. The indemnity, of half the regular pay-roll, is not intended to reimburse the policy-holder for loss of profits through strikes, but simply to make good to him the outlay necessary to keep his establishment in good order and repair during the cessation of operations. As to what constitutes an "unjustifiable strike," entitling the sufferer from it to indemnity, a few rules are laid down, but the application of them is placed in the hands of an executive committee. A strike of workmen to enforce a demand for the dismissal or employment of any person is classified as being always unjustifiable, and as giving a valid claim to indemnity. In other cases, where "demands have been made which the condition of the business does not justify," or which "threaten the authority of the management," the executive committee makes an examination on the ground, the policy-holder being bound to give full and truthful answers to all questions, and is empowered to endeavor to bring about an understanding between the parties. If it fails, its report decides finally whether the case warrants the payment of indemnity. It is hardly necessary to say that the interest of the company, as well as of its policy-holders collectively, lies in the avoidance or speedy settlement of strikes, so that it is likely to be an important agency in the direction of industrial peace; while its rule, that it will support all its members against coercion by strikes in the matter of employing or dismissing workmen, is likely to take from the hands of the agitators the terrible weapon by which they have for so many years extorted money from their victims, and driven to despair those who ventured to question their authority.

THE American Consul at Patras, Greece, calls the attention of American architects to an international competition for designs for a large church in that city. The church is to accommodate five thousand people, and is not to cost more than two hundred and fifty thousand dollars. Naturally, it is desired that the building should be in the Byzantine style, and it must be designed with a view to resisting earthquakes, which are very common in that part of Greece. The contest is a double one. In the first competition, which closes February 13, 1903, plans, elevations and a perspective view are required, at a small scale, and a certain number of designs will be selected, the authors of which will be invited to submit additional drawings. Five months will be allowed for the preparation of these additional drawings, and, at the end of that time, the competing designs will be submitted to some academy of fine-arts, which will make the final award. In accordance with the award, three prizes will be distributed, varying from four hundred to two thousand dollars.

THE people who have crossed the Gemmi Pass, where an overhanging cliff, fourteen hundred feet high, separates the fair-haired, blue-eyed, German-speaking Protestants of Canton Bern from the dark-haired, French-speaking Catholics of Canton Valais, will be interested to learn that steps are to be immediately taken to construct a tunnel under this pass, from Frutigen, on the north, which is already in railway communication with the Swiss railway system, to Brieg, a station on the Paris, Lyons and Mediterranean Railway, and the terminus of the Simplon tunnel. It is evident that the Swiss, and probably, the Germans also, view with misgivings the progress of the Simplon tunnel, which will throw a vast traffic from Genoa and the rest of Italy over the French lines, and have determined to intercept, if possible, a portion of it, by a tunnel which will connect the Simplon directly with Bern, Basel and the Rhine valley. By a great majority, the people of Canton Bern recently voted to subscribe for one-fourth of the stock of the tunnel railway; and the manufacturers of the region served by it will undoubtedly find the investment a profitable one.

NOTES ON IRON AND STEEL CONSTRUCTION.¹—X.

STEEL-BEAM grillage is the form of foundation-construction shown in Figure 68, and this type of foundation is principally resorted to where the loads to be supported are heavy and the soil is exceedingly plastic. Its use is especially recommended where a thin and compact stratum overlies another of a more yielding nature, and where, in consequence, the allowable height of the foundation is limited, for, if possible, the requisite area for the foundation must be obtained without penetrating the firm strata, and without encroaching too much upon it. The steel-beam grillage type of foundation is especially adapted for tall buildings, and particularly in those buildings in which the entire load is carried on isolated footings or piers—that is, where there is no continuous foundation-wall.

The advantage of this type of footing in such instances exists in the fact that they can be nicely proportioned, so that uniform settlement is ensured; besides, steel-beam grillage affords a foundation which has a minimum height—that is, the distance between the top of the column base and the bottom of the footing is less than in any other type of footing when correctly proportioned. This type of footing also possesses the ad-

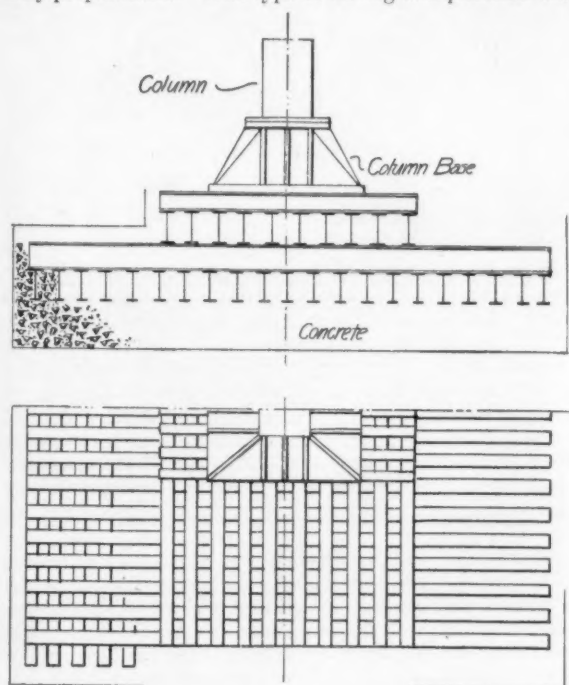


Fig. 68.

vantage that it may be readily and rapidly constructed, and at a reasonable cost.

Steel-beam grillage footings usually consist of two or more layers of steel I-beams or rails. In constructing this type of foundation a bed of concrete not less than 12 inches thick, composed of 1 part Portland-cement, 2 of sand and 5 of broken stone is first laid; upon this the steel I-beams in the first tier are placed side by side, there being a sufficient number of them to distribute the load over the desired area. These beams are entirely bedded in the concrete by filling between and thoroughly ramming. The second tier of beams, supporting the cast-iron base, is laid across the first layer, reaching to the extreme outer edge; the space between these beams is likewise filled with concrete. Separators must be provided between the I-beams, and the distance between the separators should not exceed 5 feet. The tie-bolts holding the separators in place should pass through the entire tier of beams. The I-beams in each tier should never be spaced closer than 3 inches at the flanges, as a less space would interfere with the ramming of the concrete, neither should the I-beams be spaced at a greater distance apart than 18 inches between centres.

In designing this type of footing the steel beams on the sides and at the ends should be entirely covered with concrete so that they are protected from corrosion. It has been a much disputed question in the minds of engineers whether iron and steel imbedded in concrete possesses durability. From examination of past work it has been thoroughly and conclusively proved that steel or iron when thoroughly imbedded in cement-mortar

or in a complete concrete will last indefinitely. Great care should be exercised to prevent initial corrosion from the moisture contained in the concrete before setting; this may be accomplished by thoroughly painting the beams with several coats of a good preservative paint, preferably a mixture of red

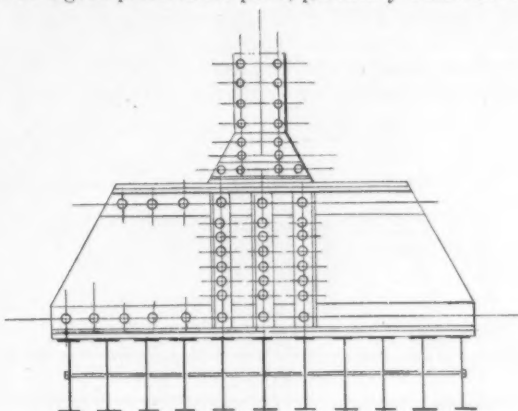


Fig. 69.

and white lead and linseed-oil. Cinder-concrete is not recommended for this type of foundation-construction, for the cinders contain chemical elements which, when united with water, are apt to promote the destruction of the steel. Should the load upon the foundation be so great as to require more beams in the second tier than can be conveniently spanned by the cast-iron base, a third tier of beams may be introduced, or a box-girder as shown in Figure 69 may be used instead of the beams. It is interesting in connection with this type of foundation to note the stipulations of the New York Building Law, which is as follows:—

“Grillage-beams of wrought-iron or steel resting on a proper concrete bed may be used. Such beams must be provided with separators and bolts enclosed and filled solid between with concrete, and of such sizes and so arranged as to transmit with safety the superimposed loads.

“Where metal is incorporated in, or forms part of, a foundation it shall be thoroughly protected from rust by paint, asphaltum, concrete, or by such materials and in such a manner as may be approved by the Commissioner of Buildings.

“When footings of iron or steel for columns are placed below the water-level they shall be similarly coated or enclosed in concrete for preservation against rust.”

The principal element in the design of foundations of this kind is the determination of the size of the steel beams. Where the foundation is constructed as shown in the diagrammatic drawing (Fig. 70), there have been two methods proposed by which the size of the beams may be determined. Some engineers figure the bending-moment upon the lower tier of beams to the point *c*, and in calculating this moment they determine the load per lineal foot sustained by all of the beams in the tier, and multiply the value thus obtained by the projecting length of the steel beams, obtaining the bending-moment by multiplying

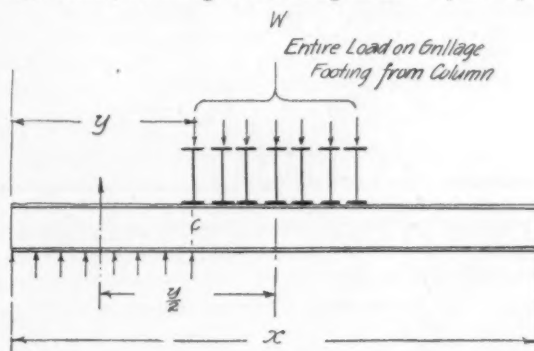


Fig. 70.

the product by one-half the projection of the steel beams composing the tier in question. For instance, let *W* equal the entire load coming upon the grillage-footing from the column, and let the length of the beams in the lower tier equal *x*. Then the entire pressure upon the soil will equal $\frac{W}{x}$. The upward force

¹ Continued from No. 1386, page 21.

acting upon the projecting portion of the beams in the lower tier, provided the projection is equal to y , will equal $\frac{Wy}{x}$, and the bending-moment about the point c will, consequently, be expressed by the formula $M = \frac{Wy^2}{2x}$.

Example.— Assume that in Figure 71 the weight W equals 200,000 pounds, and that the projection of the grillage, or y , is

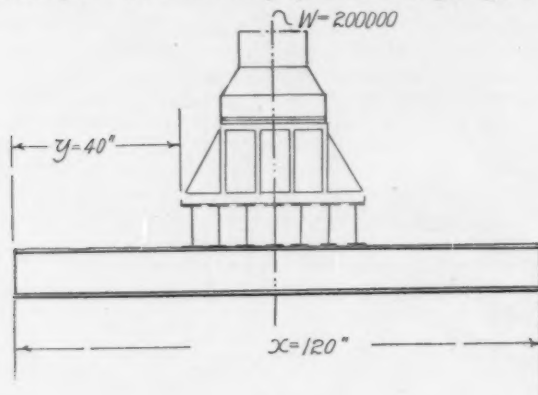


Fig. 71.

equal to 40 inches, while the total length of the beams in the lower tier is equal to 120 inches. By applying the formula $M = \frac{Wy^2}{2x}$ the value of M , upon substitution, is found to equal $\frac{200,000 \times 40 \times 40}{2 \times 120}$, or, 1,333,333 inch-pounds. Provided there were 10 beams in the bottom tier, the resisting moment required in each will equal $1,333,333 \div 10$, or 133,333. If a unit fibre-stress of 18,000 pounds is considered allowable, the section modulus required for each beam will equal $133,333 \div 18,000$, or 7.4, and 7-inch beams, weighing 15 pounds, would probably be used.

The assumption upon which this formula just demonstrated has been based is that the greatest bending-moment occurs at the point c ; this is theoretically incorrect, for the greatest bending-moment on the bottom tier of beams occurs at the centre, or at the point c in Figure 72. Though the advocates of the formula just given claim that the results are amply safe, because the concrete between and around the beams reinforces them and cannot but increase their strength materially, the more conservative practice prefers to consider the greatest theoretical bending-moment, that is, the moment at the centre of the beams in the lower tier. This formula is readily solved by the theory of moments, and their application to the strength of beams, which was treated at length in a previous article.

Referring to Figure 72 let the weight upon the column, or the load transmitted by the upper tier of beams, equal W , and

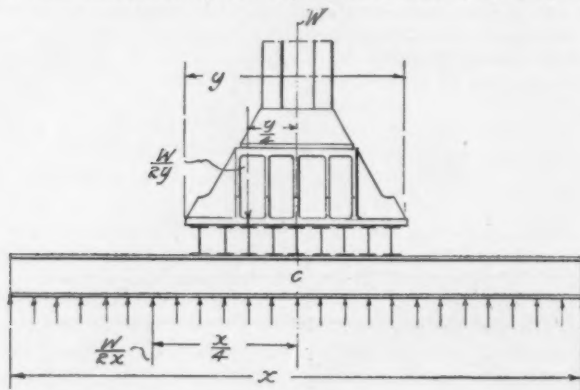


Fig. 72.

let the length of the lower tier of beams, as before, equal x , while the width of the upper tier of beams is equal to y ; the upward pressure per inch of length upon the lower tier of beams in the grillage will then equal, as before, $\frac{W}{x}$, and as these forces can be considered as forming a uniformly distributed load, the length of lever-arm of that portion upon one-half

of the tier is equal to the distance from the centre-of-gravity of the half-load to the point c , or $\frac{x}{4}$, so that the upward moment of the pressure from the soil upon one-half of the length of the beams in the lower tier of the grillage is equal to $\frac{W}{2x} \times \frac{x}{4}$, or, $\frac{Wx}{8}$; there is opposed to this upward moment a downward moment about the point c equal to $\frac{W}{2y} \times \frac{y}{4}$, or $\frac{Wy}{8}$, so that the algebraic sum of the moments about the point c is equal to $\frac{Wx}{8} - \frac{Wy}{8}$, or $\frac{W(x-y)}{8}$, or, as it is usually expressed, $\frac{1}{8} W(x-y)$. This formula being so commonly used, may be expressed in the following:—

Rule.— The bending-moment upon the beams in the bottom tier of a grillage-footing is found by multiplying one-eighth of the load from the column by the difference between the length of the lower tier and the width of the upper.

Example.— Assume the conditions proposed in the previous problem, in which the load upon the column was 200,000 pounds, the width of the upper tier 40 inches and the length of the beams in the lower tier 120 inches. By substitution in the formula $M = \frac{1}{8} W(x-y)$, the value of M is found to equal $\frac{200,000}{8} (120 - 40)$, or 2,000,000 inch-pounds. This, as will be noted from the result previously obtained by the first formula, is considerably greater, which demonstrates conclusively that, theoretically, the greatest bending-moment is at the centre

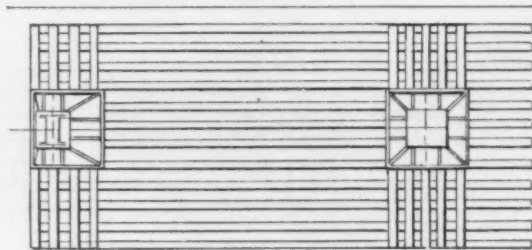


Fig. 73.

of the under tier of beams in the grillage, and not at the edge of the outer tier. In this instance, since the bending-moment is 2,000,000 inch-pounds, and there are ten beams in the tier, the bending-moment upon each beam would equal 200,000 pounds, and if a safe-unit fibre-stress of 18,000 pounds is assumed, the section modulus required for each beam will equal $200,000 \div 18,000$, or, approximately, 12, and in consequence, there would be required for the lower tier of this footing ten 8-inch I-beams, weighing 18 pounds per foot.

In the design of steel-beam grillage it is often found necessary to support two columns upon one continuous tier of beams. Such construction is usually required on account of the proximity of the columns, and because it is impossible to secure sufficient area by means of a single grillage-footing under the separate columns, and while this construction should never, if possible to avoid, be resorted to, its use oftentimes becomes imperative. The principal difficulty in the design of such a footing as described and shown in Figure 73 exists in the fact that if one of the columns is more heavily loaded than the other, the footing at the end supporting the heaviest load will tend to settle more than at the other. This unequal settlement or tilting is sure to occur when the soil is of a plastic nature, when the variation between the loads of the column is great, and when the footing is made the same width throughout its length. To obviate this difficulty it would seem reasonable to design the footing in the form of a trapezoid, the narrow end of the trapezoid being adjacent to the column supporting the heaviest load. In other words, the centre-of-gravity of the column loads should coincide with the centre-of-gravity of the resultant reaction from the pressure of the soil. Before designing such a footing it is consequently desirable to determine the centre-of-gravity of the loads, assuming that there is a variation between them; in order to determine the distance from one end of the bottom tier of steel beams to the centre-of-gravity of the loads, the following formula can be applied:—

$$D = \frac{(W_1 \times y_1) + (W_2 \times y_2)}{W_1 + W_2}$$

in which D equals the distance from one end of the bottom tier of steel beams to the centre-of-gravity of the loads, W_1 equals the load upon the first column, and W_2 the load upon the second

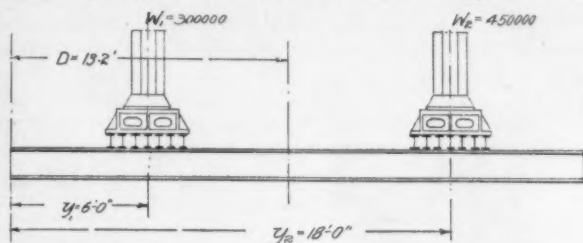


Fig. 74.

column, while y_1 and y_2 equal, respectively, the distances of W_1 and W_2 from the same end of the grillage as D is to be measured. This formula is the same as employed for the determination of the neutral axis, or a line passing through the centre-of-gravity of any section as previously described.

Assume, for example, that the load W_1 in Fig. 74 equals 300,000 pounds, and that the load W_2 equals 450,000 pounds, that the distance y_1 equals 6 feet, and that the distance y_2 equals 18 feet.

Then, by substitution, $D = \frac{(300,000 \times 6) + (450,000 \times 18)}{300,000 + 450,000}$, or

13.2, and, consequently, the correct form for the area of the footing to partake is a trapezoid, whose centre-of-gravity or neutral axis is at a distance from the small end equal to 13.2 feet.

After the centre-of-gravity of the area for the footing has been located in this manner, and the tier of beams so arranged that the unit pressure from the soil beneath the grillage will be uniform, the bending-moments may be calculated. In the grillage-footing shown in Figure 75, which supports two columns, the greatest bending-moments occur at three points, namely, beneath the respective columns and at some point between them, the bending-moment in each case being at the point of no shear. The loads from the two columns and the pressure of the soil from beneath tend to distort the bottom tier of beams in the grillage by causing them to deflect convexly beneath the columns, and to bend upwards concavely between them. In this system of grillage, as previously stated, it is necessary to locate those points beneath the two columns, and at some point between them, as M_1 , M_2 and M_3 , at which the shear equals zero.

The unit pressure from the soil upon the bottom tier of beams may be represented by p , while the pressure per unit of length from column W_1 may be represented by p_1 , the pressure per unit of length under the column W_2 being represented by p_2 . These values p_1 and p_2 are obtained by the following formulas, which are clear upon reference to Figure 75:—

$$p = \frac{W_1 + W_2}{l}$$

$$p_1 = \frac{W_1}{x_1}$$

$$\text{while } p_2 = \frac{W_2}{x_2}$$

When the values of p have been ascertained in this manner, the distances from the left-hand end of the lower tier of beams,

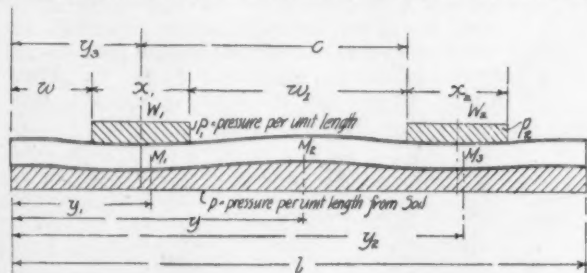


Fig. 75.

to the points at which the shear is equal to zero, may be represented by y_1 and y_2 ; in obtaining the value y_1 it is true that $y_1 p = p_1(y_1 - w)$, or $y_1 = \frac{w p_1}{p_1 - p}$; in determining the value y it is true that $y p = W_1$, or $y = \frac{W_1}{p}$; in determining the distance y_2 the

$$\text{value } y_2 p = W_1 + [y_2 - (w + x_1 + w_1)] p_2$$

$$y_2 = \frac{(w + x_1 + w_1) p_2 - W_1}{p_2 - p}$$

In application of these formulas assume that it is required to determine the three points at which the greatest bending-moments exist, or at which the shear is said to change signs, or to equal zero in the steel-beam grillage-footing shown in Figure 76.

The value to be substituted in the three formulas just given for ascertaining the values y_1 , y and y_2 are $W_1 = 300,000$; $W_2 = 500,000$; $w = 3$; $p_1 = \frac{W_1}{4}$, or 75,000; $p = \frac{W_1 + W_2}{26}$, or

30,769; $p_2 = \frac{W_2}{x_2}$, or 83,333; $x = 4$, and $w_1 = 10$, and the calculation and results of the formulas are as follows:—

$$y_1 = \frac{3 \times 75,000}{75,000 - 30,769}, \text{ or } 5.10 \text{ feet.}$$

$$y = \frac{300,000}{30,769}, \text{ or } 9.75 \text{ feet.}$$

$$y_2 = \frac{(3 + 4 + 10) 83,333 - 300,000}{83,333 - 30,769}, \text{ or } 21.24 \text{ feet.}$$

When these several distances from the end of the beam to the point of no shear, or greatest bending-moment, have been obtained in this way the several bending-moments at these points may be obtained by taking the algebraic sum of all the moments about each point. For instance, if all the downward forces are regarded as positive, and all the upward forces are considered as negative, the positive moments at a point y_1 distant from the left-hand end of the grillage or bottom tier of beams of the footing shown in Figure 76 will equal $\frac{p_1 (y_1 - x)^2}{2}$, while the negative moments from the upward pressure of the soil about the same point will equal $\frac{p y_1^2}{2}$; so that the algebraic sum of these moments about the point y_1 distance from the left-hand

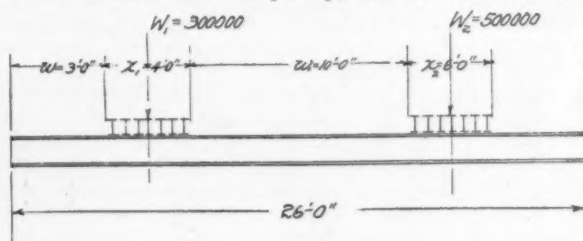


Fig. 76.

end of the tier will equal M_1 , or $\frac{p_1 (y_1 - x)^2}{2} - \frac{p y_1^2}{2}$. Regarding,

as before, the downward forces as positive and the upward forces as negative, the bending-moment about $M_2 = W_1 (y_2 - \frac{y}{2})$

for the positive moment about the point in question is equal to $W_1 (y - y_3)$, while the negative moment about the same point is equal to $p y \times \frac{y}{2}$, or $\frac{p y^2}{2}$, so that the algebraic sum of the two

values equals $W_1 (y - y_3) - \frac{p y^2}{2}$; but $p y$ must be the same as

W_1 , for the shear at the point under consideration is zero; that is, the direct downward action is equalized by the direct upward reaction; therefore, by placing the negative value within the parenthesis, and changing the signs, M_2 is found to equal $W_1 (-y + y_3 + \frac{y}{2})$, or $W_1 (y_3 - \frac{y}{2})$, which is in form and value

the same as given above. In a similar manner, the bending-moment about a point at a distance from the left-hand end of the tier equal to y_2 is found by taking the algebraic sum of the moments about the point. Here the positive moments, or those tending to operate the beam about the left of the point in question in a direction opposite to the moment of the hands of a clock, are equal to $W_1 (y_2 - y_3) + \frac{p_2 (y_2 - y_3 - c)^2}{2}$, while the negative moment about the same point tending to turn the left-hand end of the beam in an upward direction, or with the movement of the hands of a clock, is equal to $\frac{p y_2^2}{2}$, so that the bending-moment about the third and last point, or M_3 , equals the algebraic sum of these values, or

$$M_3 = W_1 (y_2 - y_3) + \frac{p_2 (y_2 - y_3 - c)^2}{2} - \frac{p y_2^2}{2}$$

In applying these formulas to the conditions of the problem designated in Figure 76, the several values to be substituted are as follows: as previously found $p = 30,769$; $p_1 = 75,000$, and $p_2 = 83,333$, while, as determined from the condition of the problem stated in the figure, $W_1 = 300,000$; $x = 4$; $y = w + \frac{x}{2}$, or 5; and $c = 10 + \frac{x}{2} + \frac{x_2}{2}$, or 15; the values of y_1, y_2 and y_3 being found from the previous calculations to equal, respectively, 5.10, 9.75 and 21.24. Therefore, by substitution in the formulas, $M_1 = \frac{p_1 (y_1 - x)^2}{2} - \frac{p y^2}{2}$, $M_2 = W_1 (y_2 - \frac{y}{2})$ and $M_3 = W_1 (y_2 - y_3) + \frac{P_2 (y_2 - y_3 - c)^2}{2} - \frac{p y_2^2}{2}$, the values M_1, M_2 and M_3 are determined from the following calculations:—

$$M_1 = \frac{75,000 (5.10 - 4)^2}{2} - \frac{30,769 \times 5.10 \times 5.10}{2}, \text{ or } 400,150 \text{ foot-pounds.}$$

$$M_2 = 300,000 \left(5 - \frac{9.75}{2} \right), \text{ or } 39,000 \text{ foot-pounds.}$$

$$M_3 = 300,000 (9.75 - 5) + \frac{83,333 (21.24 - 5 - 15)}{2} - \frac{30,769 \times 21.24 \times 21.24}{2}, \text{ or } 5,465,205$$

or the value in inch-pounds will equal for $M_1, 4,801,800$; $M_2, 468,000$; and $M_3, 65,582,400$.

From these deductions and calculations it will be observed that the greatest bending-moments are at the two end points of no shear, and that the bending-moment at the middle point was comparatively small. This will always be the case unless the column-bearings are an extremely short distance from the end of the grillage, and the maximum bending-moment of these two will usually be under the column-base supporting the heaviest load. When the column-bases are especially designed to sustain the necessary transverse stress, that is, when they are capable of carrying the load on their perimeters, and when long beams can be used in the upper tier of the grillage, the bending-moments at M_1 and M_3 are reduced to a certain extent, but the value of M_2 remains unchanged.

It is frequently desired that a raft, or grillage-foundation footing, support three columns or bases, instead of two, as described above, and the conditions that lead to such requirements are shown in Figure 77. Here, it is necessary to transmit the pressure on the soil away from the lot-line, so that there will be no interference with the footings under the adjacent building, and in order to accomplish this the exterior column in the basement is set back from the party-line and the upper columns and curtain-wall is supported upon the end of cantilever girders. The principal aim in proportioning such a grillage-footing, as previously stated, is to observe that the centre-of-gravity of the supporting-area of the footing is coincident with the centre-of-gravity of the loads upon the column or base. This desirable result may be secured either by irregularity in the spacing of the columns to suit their respective loads, which is hardly allowable by the designing of the building, and by spreading the

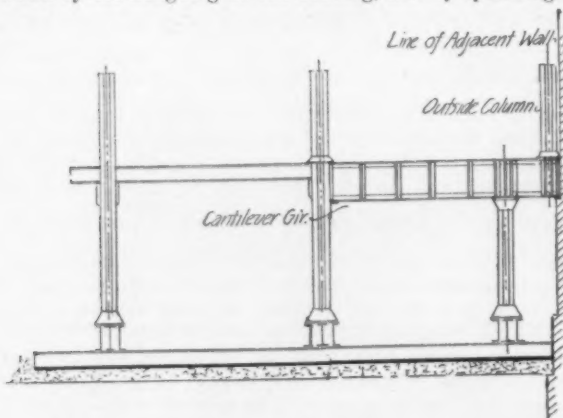


Fig. 77.

grillage at one end and increasing its projection. In order to determine the distance from either end of the centre-of-gravity of the loads upon a three-column grillage, which must coincide as nearly as possible with the centre-of-gravity of the upward reaction of the soil, proceed as follows: multiply the amount of each column or base load by its respective distance from a specific end of the grillage and divide the sum of these moments

by the sum of all the column-loads. This rule is more clearly expressed by formula, and if D equal the desired distance upon reference to Figure 78, the amount may be expressed by the formula

$$D = \frac{W_1 y_1 + W_2 y_2 + W_3 y_3}{W_1 + W_2 + W_3}$$

The values as p_1, p_2, p_3 and p , which are the values per unit of length, respectively, for the load W_1, W_2, W_3 , and the upward

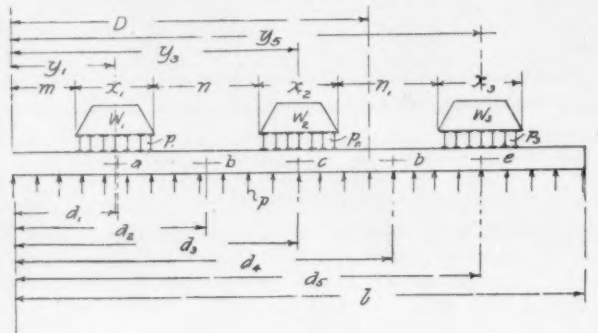


Fig. 78.

pressure of the soil, or $W_1 + W_2 + W_3$, may be expressed by the formula

$$p_1 = \frac{W_1}{x_1}; p_2 = \frac{W_2}{x_2}; p_3 = \frac{W_3}{x_3}$$

while

$$p = \frac{W_1 + W_2 + W_3}{l}$$

The several column-loads and the upward reaction of the soil produce deflection, or, rather, tend to produce, for the beams are held rigidly against flexure by the concrete bed and filling, and, consequently, there is no shear at five points, as at a, b, c, d, e , so that the maximum bending-moments take place at these points. These bending-moments may be conveniently expressed by the letters M_1, M_2, M_3, M_4, M_5 , signifying the moments at the first, second, third, etc., position from the left-hand end of the grillage.

Before the bending-moments can be calculated, however, it is necessary to determine their position from one end or the other of the beam, and this may be done by equating the amount of pressure from the soil beneath the beam, included in the distance from the end to the point which it is desired to locate, with the downward pressure due to the several loads acting upon the top of the beams included in the same length of beam or grillage. For instance, the upward reaction due to the pressure of the soil beneath the grillage from the left-hand end of the beam to a point at d_1 distant from the left-hand end of the beam is equal to $p d_1$; the reaction from the soil from beneath the grillage to a point at d_2 distant from the left-hand end of the beams is equal to $d_2 p$; likewise the upward pressure to a point d_3 distant from the left-hand end of the grillage is expressed by $d_3 p$, while in the same way the upward pressure from the end of the beam to a point distant d_4 equals $d_4 p$, etc.; in order, therefore, that the vertical shear upon the grillage shall equal zero at the points a, b, c, d, e , in Figure 78, or at the points of greatest bending-moment represented by M_1, M_2, M_3, M_4, M_5 , there must be at each point d_1, d_2, d_3 , etc., distant from the left-hand end a downward pressure in opposition and equal to $d_1 p, d_2 p, d_3 p$, etc.; this downward pressure at d_1 will equal a portion of the load W_1 ; at d_2 it will include all of the load W_1 , while at d_3 it will include the entire load of W_1 and a portion of the load W_2 ; the downward pressure at the point d_4 being likewise equal to the entire load W_1 and W_2 . From this it will be quite evident that the following equations may be correctly deduced:—

$$d_1 p = (d_1 - m) \times p_1, \text{ or } d_1 = \frac{m p_1}{p_1 - p}$$

$$d_2 p = W_1, \text{ or } d_2 = \frac{W_1}{p}$$

$$d_3 p = W_1 + [d_1 - (m + x_1 + n)] p_2, \text{ or}$$

$$d_3 = (m + x_1 + n) \times \frac{p_2 - W_1}{p_2 - p}$$

$$d_4 p = W_1 + W_2, \text{ or } d_4 = \frac{W_1 + W_2}{p}$$

$$d_5 p = W_1 + W_2 + [d_5 - (m + x_1 + n + x_2 + n_1)] p_3, \text{ or}$$

$$d_5 = \frac{(m + x_1 + n + x_2 + n_1) \times p_3 - W_1 - W_2}{p_3 - p}$$

When these several distances have been ascertained, the negative and positive moments about each of these points, the location of which is found, may be calculated, and their algebraic sum will equal the bending-moment at the five points where it reaches the maximum throughout the girder. In determining the formulas for the bending-moment it should be observed that in figuring the moment of any uniformly distributed load the length of its lever-arm is considered from the centre-of-moments to the centre-of-gravity of the load. For instance, in a cantilever supporting a uniformly distributed load of W upon a length equal to l , the lever-arm by which the moment is created at the point of support is equal to $\frac{l}{2}$, and the bending-moment at the same point is $\frac{Wl}{2}$. Referring to Figure 78, the positive moments at M_1 , M_2 , M_3 , M_4 and M_5 are respectively equal to $\frac{p d_1^2}{2}$, $\frac{p d_2^2}{2}$, $\frac{p d_3^2}{2}$, $\frac{p d_4^2}{2}$ and $\frac{p d_5^2}{2}$, while the negative moments about the same points are equal, respectively, to $\frac{p(d_1-m)^2}{2}$, $W(d_2-d_1)$, $\frac{p_2(d_3-m+x_1+n)^2}{2} + W_1(d_3-d_1)$, $W_1(d_4-d_1) + W_2(d_4-d_3)$ and $\frac{p_2(d_5-m+x_1+n+x_2+n_1)^2}{2} + W_1(d_5-d_1) + W_2(d_5-d_3)$, and by combining the two sets of values the following equations for the bending-moments are obtained:—

$$\begin{aligned} M &= \frac{p d_1^2}{2} - \frac{p(d_1-m)^2}{2} \\ M_2 &= \frac{p d_2^2}{2} - W_1(d_2-d_1) W_1 b - W_1 \frac{d_2^2}{2} = W_1(b - \frac{d_2}{2}) \\ M_3 &= \frac{p d_3^2}{2} - \frac{p_2(d_3-m+x_1+n)^2}{2} + W_1(d_3-d_1) \\ M_4 &= \frac{p d_4^2}{2} - W_1(d_4-d_1) + W_2(d_4-d_3) \\ M_5 &= \frac{p d_5^2}{2} - \frac{p_2(d_5-m+x_1+n+x_2+n_1)^2}{2} \\ &\quad + W_1(d_5-d_1) + W_2(d_5-d_3) \end{aligned}$$

Usually in this style of grillage footing the bending-moments at M_2 and M_4 will be small and the maximum bending-moment will be at one or the other of the points M_1 , M_3 , or M_5 , depending upon which point supports the greatest column-load.

In the several solutions for the bending-moment given, the upward reaction of the soil was considered as of uniform intensity and not of varying pressure, as would exist were there any deflections in the beams and concrete forming the footing. Such deflection is not likely to occur when it is considered that the beams are thoroughly embedded in the concrete and are greatly stiffened thereby.

In the next article, the design of spread footings, armored concrete or of the Melan construction will be considered, and a comparison of cost between such footings and the steel-beam grillage summarized.

M. M. SLOAN.

[To be continued.]



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

A COMPETITIVE DESIGN FOR THE BOSTON ATHENEUM, BOSTON, MASS. MESSRS. RANKIN & KELLOGG, ARCHITECTS, PHILADELPHIA, PA.

It is understood that this design was held by the jury deserving of second place.

ELEVATION AND SECTION OF THE SAME.

A COMPETITIVE DESIGN FOR THE BOSTON ATHENEUM, BOSTON, MASS. MR. A. W. LONGFELLOW, ARCHITECT, BOSTON, MASS.

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

VILLA OF THE HERREN KALMBACH, MUNICH, BAVARIA. HERR E. DROLLINGER, ARCHITECT.

This plate is copied from *Architektonische Rundschau*.

[Additional illustrations in the International Edition.]

HOUSE OF DR. A. COOLIDGE, NO. 487 COMMONWEALTH AVE., BOSTON, MASS. MR. R. C. STURGIS, ARCHITECT, BOSTON, MASS.

IN our issue for August 23d last we published a view of the adjoining house, also designed by Mr. Sturgis, and ascribed the ownership to Dr. A. Coolidge, whereas it should have been ascribed to Dr. George Haven.

HOUSE OF THOMAS LOCKWOOD, ESQ., NO. 111 BAY STATE ROAD, BOSTON, MASS. MESSRS. WINSLOW & BIGELOW, ARCHITECTS, BOSTON, MASS.

UNIVERSITY OF PENNSYLVANIA DORMITORIES, PHILADELPHIA, PA.: GROTESQUES;—ARCADE TO SMALL TRIANGLE. MESSRS. COPE & STEWARDSON, ARCHITECTS, PHILADELPHIA, PA.

SOME ENTRANCES: UNIVERSITY OF PENNSYLVANIA DORMITORIES, PHILADELPHIA, PA. MESSRS. COPE & STEWARDSON, ARCHITECTS, PHILADELPHIA, PA.

DETAILS: UNIVERSITY OF PENNSYLVANIA DORMITORIES, PHILADELPHIA, PA. MESSRS. COPE & STEWARDSON, ARCHITECTS, PHILADELPHIA, PA.

CORRECTION.—We had the misfortune in our last issue to deprive Messrs. Stickney & Austin, architects, of Boston, of the authorship of the design of the house of Ex-mayor E. U. Curtis, on the Bay State Road, by wrongfully attaching to the illustration of the doorway of the house the names of Messrs. Winslow & Bigelow as architects.



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

"WHEN DO BUILDING OPERATIONS BEGIN?"

BOSTON, MASS., September 16, 1902.

TO THE EDITORS OF THE AMERICAN ARCHITECT:—

Dear Sirs,—Your correspondent Mr. Cervin inquires what constitutes the first beginning of work on a building or wall. About ten years ago a new building-law went into effect in Boston which materially changed some of the existing provisions in regard to construction. I was at that time engaged upon the construction of a large office-building, permit for which had been granted some time before the law went into effect, but I was notified by the Building Department that the City Solicitor had decided that for a building to have been begun it was not sufficient for the excavation to have been made, but that some of the actual permanent construction of the building must be in place. This is one decision that might fix the point upon which your correspondent inquires.

Yours very truly, C. H. BLACKALL.



SCOTCH GARDENS.—Scotland has many good gardens. The Duchess of Sutherland cares much for her garden at Dunrobin Castle. Owing to the mild climate and rich soil of this corner of Scotland, the Dunrobin gardens seem at their best in the earliest spring, when the millions of snowdrops are in full bloom. At Glamis Castle, the chief feature is a famous sundial. It stands on the lawn, has 84 dials, and is supported by lions carved in stone. One hardly expects to find a garden on the lines of Versailles in the heart of Scotland; but such can be seen at Hopetoun House, belonging to Lord Hopetoun. Gray, the poet, praised these beautiful, if somewhat formal, parterres; and Byron observed that "such symmetry was not for solitude." Terraced gardens are approved in Scotland; they are seen at Balcarres House, belonging to Lord Crawford, and are a feature at Drumlanrig, the princely domain of the Duke of Buccleuch.—*Illustrated Carpenter and Builder*.

EARLY HOURS.—Builders will be gratified by the decision which was given in the Court of Appeal on Tuesday last. An enlargement of Harrod's Stores is in progress, and, as is usual in all works of importance where expedition is essential, a steam crane is employed. Some of the residents in the neighborhood applied for an injunction to restrain the crane from operating as early as 6.30 A.M. Mr. Justice Buckley granted an injunction which would prevent the use of the crane before 7 A.M. The defendants appealed on the ground that they would suffer a serious penalty, as they would be paying a large number of men for half an hour in which no work could be executed. Lord Justice Vaughan Williams stated that the Court could not say that it was unreasonable to begin using a crane at 6.30 A.M. There was no vested right which secured people living in a residential street from being disturbed before 8 A.M. It was to the interest of every one to have the work executed as quickly as possible. He thought that the

injunction ought to be discharged. Lord Justice Mathew agreed, and was of opinion there was no ground for the application or for the injunction. — *The Architect*.

TRIPARTITE STROKE OF LIGHTNING.—A correspondent of *Nature* writes as follows concerning a tripartite stroke of lightning in Cambridgeshire, England: "At 6.50 p. m. on August 7, after two or three preliminary low thunder rumblings, which by no means prepared us for what was to come, a most tremendous crash of combined thunder, lightning and electric discharge burst right over my residence here. My butler, who was looking in the direction of our front gate, 80 yards to the north of our front door, saw a burst of smoke, mingled with a shower of leaves, rise into the air out of the adjoining shrubbery. My coachman, who was sitting just within the open door of the lodge, close to the front gate, was dazed by a vivid burst of flame at his feet which seemed to leap into the doorway. My neighbor's gardener, looking out of the lodge opposite, saw a nearly horizontal flash of fire enter the shrubbery close to my front gate. A subsequent examination of the surroundings of the front gate and my coachman's lodge has revealed: (1) A tearing-up of the ground close to the massive iron post of the front gate, the splitting of a large flint at its foot, and a litter of ivy-leaves on the gravel. (2) The clean cutting in two of an oak post, 35 yards distant to the northeast, from which an iron hand-gate was hanging. (3) The scorching of the outside foliage of a horse-chestnut some 15 yards still farther off, in a direct line with the other two objects struck. In thirty years' experience of thunder-storms, which are rather frequent here, I have never observed the simultaneous striking of three different points by the electric discharge. A deathlike stillness succeeded the crash, the storm appearing to have exhausted itself in a single tremendous explosion. Heavy rain was falling when the crash occurred."

THE ROMAN MONUMENT TO VICTOR EMMANUEL.—The architect of the great monument to Victor Emmanuel, the "Father of his Country," has publicly announced that the work has lately taken such strides that it will be finished in seven years. This, added to the thirty-odd years since the monument was begun, seems a tremendous time, to modern ideas, especially as the money was forthcoming from the first. This impatience is, however, reproved by the ancient buildings surrounding the great work, many of which were hundreds of years in the building. The new monument stands at the extreme end of the historic Corso, which before closed in a medley of odd buildings. Many of these have already been torn down to make the necessary space, and others are in process of demolition, so that the colossal monument will have in front the stretch of the Corso to the Piazza del Popolo on one hand, the Capitol and the Church of the Ara Colli, with their majestic sweep of steps, and on the other Trajan's Forum, with its unrivalled storm beaten column and the twin churches at its northern end. The monument will be a grandiose building of porticos, Corinthian columns, statues and bas-reliefs, which will house two or more museums, and perhaps a library, surmounted by a magnificent triumphal group of horses and chariot driven by "Victory," the whole rising about 290 feet. In front, standing well out from the building, on its own pedestal and approached by steps, will be an equestrian statue of the Re Galantuomo. The taste of the whole has by some critics been seriously questioned, if not condemned, but no one can deny that the effect at the end of the Corso, the centre of the life of the city, will be stupendous. — *Pall-Mall Gazette*.

LONDON'S VAST PROBLEMS.—The report of the London County Council published this week furnishes some striking figures indicating the immensity of the municipal problem with which the London authorities are confronted. According to the census of 1901, the population of the Administrative County of London was 4,536,541, while Greater London, immediately surrounding the County, showed an additional population of 6,500,000. The lunacy statistics of the Administrative County show an increase of 50 per cent in the last ten years, the total number of lunatics being 21,369, for which drink and business and domestic troubles were accounted to be largely responsible. The London County Council has to maintain 2,017 miles of paving, a large section of which is in a constant state of upheaval, owing to the number of gas, electric and water companies having the power to open roadways. The problem of housing the working-people is dealt with on a large scale, the Council acting as landlord to a population of 12,596 housed in cottages, block dwellings and various other structures. The year's working showed a net surplus of \$11,565 for these dwellings compared with a deficit of \$5,785 for the previous year. The Council is a large owner of omnibus and street-car lines, which carried last year over 118,000,000 passengers, while all the omnibus lines of Greater London showed the enormous total of 530,000,000 passengers. The city's debt statistics show a discouraging increase, the total debt outstanding being \$231,344,355, equivalent to 124.98 per cent of the ratable value, against 104.64 per cent when the London County Council came into existence. The tax-rate now amounts to about 36½ cents per pound sterling (\$5). — *N. Y. Tribune*.

STUDIOS FOR POOR PARIS ARTISTS.—Alfred Boucher, an artist, is making a novel effort to help less fortunate fellow-craftsmen. From various architectural fragments and waste material from minor exposition buildings he has constructed, in the Vaugirard Quarter, Paris, a large domed building providing 48 studios and a common hall. These are to be rented to painters and sculptors for prices ranging from \$30 to \$50 a year, the latter sum providing sufficient room for living quarters. The privileges of the common room, with special arrangements for art-work, and free instruction by M. Boucher, are to cost but \$10 a year. A building close by is to serve as a museum for art-works owned by M. Boucher, who has also lavishly decorated the corridors of the studio building with paintings. — *Success*.

THE WANE OF THE LIGHTNING-ROD.—The day of the lightning-rod is passing, says the *New York Evening Post*. The Government's latest census returns show that Franklin's invention for protecting the house is little used to-day. No electrical-manufacturing establishment reports it among the products, and so far as the census expert has been able to learn, only one American electrical-engineering firm makes a business of setting-up the rods or designing them. So far as large cities are concerned, disastrous lightning-strokes are reported to be more rare, and the decrease is accounted for by the network of electrically charged wires and other apparatus with which the city is now interwoven and surrounded.

BORT.—The only place in the world where that form of carbon known as the black diamond, or bort, is found in marketable quantities is in Bahia, in South America. The substance is used for points for stone drills and saws, and is powdered and used to polish diamonds and other precious stones. There is a wide and growing demand for it. The black diamond is found with the ordinary diamonds in the Bahia fields and brings about ten dollars a carat. The largest carbon ever found weighed 3,150; it was bought from the miner for \$16,000; was afterward purchased for \$25,000; and was sent to Paris, where it was broken up and sold to the trade. The average size is about six carats. The annual output is decreasing as the demand grows larger, and the price is mounting. It is probably only a question of time when a black-diamond combination will be formed to work the small area with modern machinery. The present methods are very primitive. — *Exchange*.

THE DAYS OF THE DALZIELS.—The death of Mr. George Dalziel, which has just occurred at Hampstead, in his eighty-seventh year, carries the mind back to the great period of English illustration that began in the sixties, when, under the influence of the work of Adolph Menzel, so many famous artists were filling the pages of periodicals with beautiful drawings. There were two firms of engravers which were specially connected with this period—the firm of Dalziel Brothers and the firm of Swain. George Dalziel (says the *London Times*) came to London first of the three brothers, whose lives and work found interesting record in a book about them published last year. They were the sons of a Northumbrian artist, and were all men of more than ordinary culture and talent. They certainly raised wood-engraving to the highest pitch of art it has ever reached in this country. The mechanical methods of photography and process-engraving have now almost entirely superseded the wood-engraver, and such wood-engraving as there is does not deserve much notice. But there remain in the old volumes of *Once a Week*, *Good Words*, the *Cornhill Magazine* and other periodicals, as well as in the books issued by the Dalziels, ample evidence to justify the remark of Mr. Pennell that "the day is coming when the books issued between 1860 and 1870 in England will be sought for and treasured up, when the few original drawings that are still in existence will be striven for by collectors, as they struggle for Rembrandt's etchings to-day." The names of the Dalziels are not likely, therefore, to be forgotten.

THE GROWTH OF VIENNA.—The boundaries of Vienna are to be again widened, and this time to such an extent that the area of the Austrian capital will be almost doubled, and will be second to that of London alone in Europe. Vienna, though it is called the Imperial City on the Blue Danube, lies, as a matter of fact, only on the right bank of that river, which forms its boundary on the northwest. A large semicircle on the left bank, embracing the manufacturing town of Floridsdorf and eleven other places, with a total area of 154 square kilometres, is now to be added to Vienna, and will raise its area from 178 to 332 square kilometres. The new districts, however, are so thinly populated that they will add only 58,000 persons to the population of Vienna, raising it to about 1,800,000. The object of including so large a tract, chiefly rural in character, and much of it liable to periodical floods, is connected with the impending construction of the Danube-Oder Canal, which will enter the Danube opposite the town and within the new district. It is expected that it will create a large industrial quarter there. The old bed of the Danube, through which the river used to flow before its canalization, will be converted into docks and harbors. As all the towns and villages concerned have signified their readiness to fall in with the scheme, and a majority in the town is in favor of it, there is little doubt that the project will shortly be carried into effect, possibly in the course of this summer. — *Illustrated Carpenter and Builder*.

ARTESIAN-WELL POWER.—Mr. W. E. W. Yerby, of Greensboro, Ala., writes to the *Scientific American* to say that "there is in this [Hale] county an artesian well 10 inches in diameter that throws out a volume of water sufficient to run a grist-mill, cotton-ginny and cotton-press and a saw-mill. The well is about 600 feet deep, and was bored fifty years ago by Col. Samuel Pickens on the plantation 12 miles southwest of Greensboro, Ala., known as the 'Goodrum Place,' now owned by Lee M. Otts, Esq. The water comes up with such force from the well that a silver dollar thrown into its mouth will not sink, but will be thrown out. The gusher has diminished very little in the amount of water furnished during the half century it has been running. To give an idea of the amount of water that is thrown from the well, I will state that the trough surrounding it is 4 feet across, and when the water falls back it comes near filling the trough from side to side. The mill and ginny run by the water from this well is situated on a hill-side about a hundred yards away, and the water is carried to it by means of a canal cut in the solid lime rock. Just under the mill-house is a well 3 feet across and 40 feet deep. In this well, at a depth of 25 feet, is a turbine wheel, and the water from the canal is turned on it when it is desired to run the machinery. A tunnel from the bottom of this 40-foot well has been cut a distance of 100 yards—ranging upward—and empties the waste-water from the mill into a branch."

THE AMERICAN ARCHITECT AND BUILDING NEWS

A WEEKLY JOURNAL OF CONSTRUCTIVE AND DECORATIVE ART

VOL. LXXVII.—No. 1395.] SATURDAY, SEPTEMBER 20, 1902. PRICE, { INTERNATIONAL ISSUE, 50 CTS
REGULAR " 15 "

WHITTIER MACHINE CO.,

PASSENGER AND FREIGHT
ELEVATORS.

53 STATE STREET - - BOSTON.

ELEVATOR SIGNALS

OF ALL KINDS

HERZOG TELESEME CO.

5 WEST 24TH ST., NEW YORK



ARCHITECTURAL INSTRUCTION.

BOSTON, MASS.

MASSACHUSETTS INSTITUTE OF TECHNOLOGY.

DEPARTMENT OF ARCHITECTURE.

Options in Architectural Engineering and Landscape Architecture.
College graduates and draughtsmen admitted as special students.

SUMMER COURSES in Elementary Design and Shades and Shadows. Proficiency in these subjects will enable draughtsmen and students from other colleges to enter third year work.

For catalogues and information apply to
H. W. TYLER, Secretary,
Mass. Institute of Technology, Boston, Mass.

CAMBRIDGE, MASS

HARVARD UNIVERSITY.

THE LAWRENCE SCIENTIFIC SCHOOL offers professional courses leading to the degree of S.B. in Engineering; Mining; Architecture; Landscape Architecture; Chemistry; Geology; Biology, etc. Graduates of colleges may be admitted to advanced standing without examination. For information, address J. L. LOVE, Secretary, 16 University Hall, Cambridge, Mass.

N. S. SHALER, Dean

REDDING BAIRD & CO

STAINED
GLASS

83 Franklin St.
BOSTON

ARE showing interesting suggestions for Dutch Rooms, Dining-Rooms, Reception Halls, Dens, and Vestibules in Antique Glasses.

Heraldic Devices and Family Crests Reproduced in Glass.

LOOMIS FILTERS.

ESTABLISHED 1880.

Improved System. Simple and Effective.

LOOMIS-MANNING FILTER CO.,

Main Office: 402 CHESTNUT ST., PHILADELPHIA.
Boston. New York. Baltimore. Washington.

ITHACA, N. Y.

CORNELL UNIVERSITY COLLEGE OF ARCHITECTURE

Offers a four-year course in Architecture leading to the degree of B. Arch.; also a two-year special course with certificate.

NEW YORK, N. Y.

COLUMBIA UNIVERSITY, IN THE CITY OF NEW YORK.

SCHOOL OF MINES.
SCHOOL OF CHEMISTRY.
SCHOOL OF ENGINEERING.
SCHOOL OF ARCHITECTURE.
SCHOOL OF PURE SCIENCE.

Four years' undergraduate courses and special facilities for graduate work in all departments. Circulars forwarded on application to the Secretary of the University.

THE PERKINS ATELIER OF ARCHITECTURE,

Submitting designs to the Society of Beaux Arts Architects, offers special courses, in French, preparatory for the Ecole des Beaux Arts.
Circular forwarded on application.

FRANK EDSON PERKINS,

111 Fifth Ave., New York

FLYNT

BUILDING AND CONSTRUCTION CO.

GENERAL OFFICE, PALMER, MASS.

We contract to perform all labor and furnish all material of the different classes required to build complete

CHURCHES, HOTELS, MILLS, PUBLIC
BUILDINGS AND RESIDENCES.

Also for the construction of

RAILROADS, DAMS AND BRIDGES.

We solicit correspondence with those wishing to place the construction of any proposed new work under ONE CONTRACT, which shall include all branches connected with the work. To such parties we will furnish satisfactory references from those for whom we have performed similar work.

The WINSLOW BROS. COMPANY,

CHICAGO,

Ornamental Iron and Bronze.

ST. LOUIS, MO.

WASHINGTON UNIVERSITY SCHOOL OF ENGINEERING AND ARCHITECTURE

Offers a four-year course in Architecture, leading to a degree of B. S. in Architecture.
College Graduates admitted to advanced standing or as special students.

FREDERICK M. MANN, Professor.

COLUMBUS, OHIO.

OHIO STATE UNIVERSITY COLLEGE OF ENGINEERING

Offers four-year courses in Architecture, Civil, Electrical, Mechanical and Mining Engineering, and in Ceramics. Tuition free. For information address,
President W. O. THOMPSON, Columbus, Ohio.

PHILADELPHIA, PA.

UNIVERSITY OF PENNSYLVANIA. SCHOOL OF ARCHITECTURE.

PROF. WARREN P. LAIRD.

BOOKS:

"Les Concours publics d'Architecture."

(A Monthly Publication.)

Edited by MM. Wulliam and Farge.

Vol. IV. 120 Plates. Price \$9.40.

AMERICAN ARCHITECT AND BUILDING NEWS CO.

BOOKS:

"Ile de France, Picardie."

PART I. I.

A portion of the series of "Archives de la Commission des Monuments Historiques."

25 Plates, folio. Price \$6.00.

AMERICAN ARCHITECT AND BUILDING NEWS CO.

ROBERT C. FISHER & CO.

Successors to Fisher & Bird,

MARBLE AND GRANITE WORKS

97, 99, 101 and 103 EAST HOUSTON STREET,

Established 1830.

NEW YORK.

A Brilliant Finish



that will stay brilliant can be obtained only by using a varnish made with the utmost care from specially selected gums, pure linseed oil and turpentine. For interior work specify

I. X. L. PRESERVATIVE COATINGS

For varnish booklet address

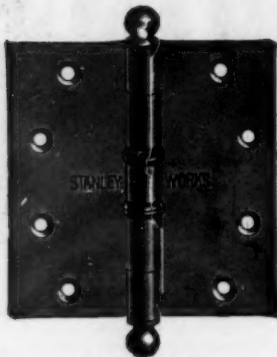
EDWARD SMITH & CO.

Varnish Makers and Color Grinders

59 Market St., Chicago, Ill. 45 Broadway, New York City

Ball Bearing Hinges

In Wrought Bronze
and Steel



ALL FINISHES

Our new Catalog can be had for the asking.

The Stanley Works, Dept. C
NEW BRITAIN, CONN.
79 Chambers Street, NEW YORK.

CLINTON WIRE-CLOTH CO.

Sole Proprietors and Manufacturers of

WIRE LATH

DOUBLE TWIST WARP
STIFFENED (Iron Furred)
CLINTON CORRUGAT'D

Plain, Japanned or Galvanized.

The Most Perfect and Economic System of FIREPROOF Construction.

SEND FOR CIRCULAR.

BOSTON,
199 Washington St.

NEW YORK,
76 Beekman St.

CHICAGO,
137 Lake St.

FACTORY,
CLINTON, MASS.

FOR INFORMATION ABOUT

U. S. MAIL CHUTES

WHICH ARE

A necessity in Office Buildings and Hotels,
write to the sole makers.

THE CUTLER MFG. CO., ROCHESTER, N. Y.
PATENTED. AUTHORIZED.

REMEMBER

that each part of "The Georgian Period" has been made better than its predecessors.

"La Construction Moderne,"

A journal of whose merits our readers have had opportunity to judge because of our frequent reference to it and our occasional republication of designs that are published in it, is the most complete and most interesting of the French architectural journals.

The seventeenth annual volume is now in course of publication.

Subscription, including postage, 35 francs.

Each weekly issue contains, besides the illustrations included in the text, two full-page plates, which by themselves are worth double the amount of the annual subscription.

PRICE OF BACK ANNUAL VOLUMES,

:: 40 Francs. ::

Address for subscriptions and catalogues,

LIBRAIRIE DE LA CONSTRUCTION MODERNE,

18 Rue Bonaparte, Paris, France.

Established nearly 40 Years

.. THE ..

ARCHITECT

AND

Contract Reporter

Published Every Friday by P. A. Gilbert Wood

6 TO 11 IMPERIAL BUILDINGS
LUDGATE CIRCUS. LONDON, E. C.

PRICE, FOURPENCE

The "ARCHITECT AND CONTRACT REPORTER" has been established nearly 40 years; has a large and influential circulation; has been proved to be the best medium for advertising to Architects, Builders and Contractors; has the finest illustrations, and has been specially noted for its Art reproductions.

Send us six English 1d. stamps and we will mail you sample copy.

Send us post-office money order for 50 cents and we will send you the last six weeks' issues.

On receipt of \$6.25 we will forward for 12 months.

[Now Ready: The Second Volume of the "Topical Architecture" Library]

"Door and Window Grilles"

104 Plates: 10 in. x 14½ in.

Uniform with the first volume ["Italian Renaissance Doorways"] of this Library

MARCH 22, 1902

THE next time you pass along the streets of one of our large cities, note what rapid progress is making in the use of wrought-metal grilles, screens and gates of various kinds for the ornamental protection of doorways and the window-openings of lower stories.

The great interest shown in this particular form of artistic artisanship just now is our reason for devoting the second volume of this Library to door and window grilles.

PRICE: Bound in Cloth \$7.50
In Portfolio 6.50

American Architect and Building News Co.
211 Tremont Street, Boston

BOOKS:

"Norman Monuments of Palermo and Environs."

31 Plates, folio and text. Price \$12.00.

AMERICAN ARCHITECT AND BUILDING NEWS CO.

Part Ten of the Georgian Period

It is certainly as good as the preceding Parts, of which critics have spoken thus :—

"Peculiarly attractive."—*Baltimore Sun.*

"A set of models of inestimable value."—*Art Interchange.*

American Architect & Building News Co., 211 Tremont St., Boston

Topographical Index of Advertisers.

[For pagination, see *Alphabetical Index* on Cover 2.]

"The Georgian Period"

THIS publication, which consists of nine Parts, contains nearly two hundred pages of text, illustrated by over three hundred and fifty text-cuts, and three hundred and thirty-two full-page plates, of which one-third are gelatine or half-tone prints. It is in truth a work of superior excellence and great usefulness.

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

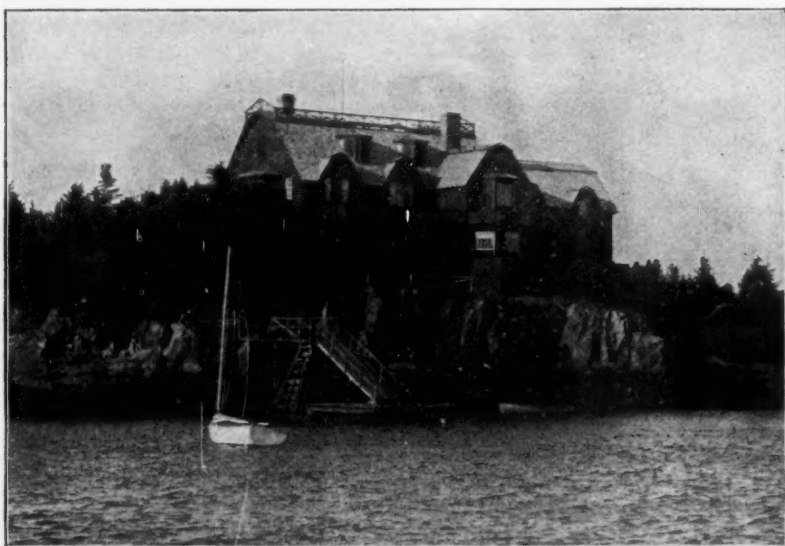
Fairbanks House, Dedham, Mass.	Date 1636
Royall Mansion, Dedham, Mass.	" 1737
Philipse Manor House, Yonkers, N. Y.	" 1745
Tudor Place, Georgetown, D. C.	" 179-
Mappa House, Trenton, N. Y.	" 1809
Woodlawn, Va.	" 1799
Mount Vernon, Va.	" 1743
and others.	

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.

AMERICAN ARCHITECT & BUILDING NEWS CO., Publishers, Boston, Mass.



*Residence of Dr. Shattuck, Dark Harbor, Me.
John Lavallo, Architect, Boston.*

CABOT'S SHINGLE STAINS

The Original and Standard

The best architects have used them for over twenty years. For softness and depth of color, wearing qualities and preservation of the wood, the imitations—like most imitations—do not compare with them. Made in all colors. Their base is Creosote, and "Creosote is the best wood preservative known."—*Trautwine*.

Samples and full details on application.

SAMUEL CABOT, Sole Manufacturer, BOSTON, MASS.

28 Dearborn Avenue, Chicago, Illinois.

AGENTS: V. H. Schneider, 8 Wooster St., New York; Samuel H. French & Co., Philadelphia, Pa.; Waterhouse & Price, San Francisco, Cal.; P. H. Matthews, Los Angeles, Cal.; Whitelaw Brothers, St. Louis, Mo.; George H. Lawes & Co., St. Paul and Minneapolis, Minn.; John H. Corning, Washington, D. C.; Brady & Co., Detroit, Mich.; The National Building Supply Co., Baltimore, Md.; Timms, Edwards & Co., Portland, Ore.; Cleveland Builders' Supply Co., Cleveland, O.; A. Muirhead, Toronto; Seymour & Co., Montreal; S. W. R. Dally, Seattle, Wash., and at all other central points.



From *Architektonische Rundschau*.

VILLA OF THE HERREN KALMBACH, MUNICH, BAVARIA.
E. DROLLINGER, ARCHITECT.

ESTABLISHED 1868
SKYLIGHTS, LATHING & METAL
71 8TH AVE. NEW YORK.
FIREPROOF WIRE-GLASS WINDOWS.

NEW ENGLAND FELT ROOFING WORKS,
18 Post Office Sq., BOSTON.
Originators of Felt Roofing in New England.
Inventors and only Manufacturers of the Celebrated
"BEEHIVE BRAND."

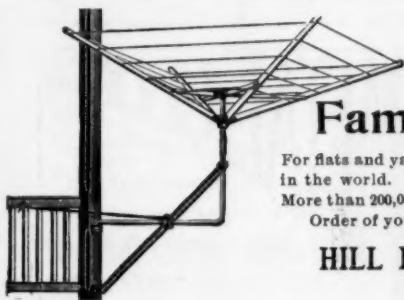
PAVING BLOCKS
1852.
Incorporated
1868.
Capital \$60,000.
Levi L. Willcutt, President
Evel C. Davis, Treasurer

DIXON'S SILICA GRAPHITE PAINT

FOR TIN OR SHINGLE ROOFS AND IRON WORK. Tin roofs well painted have not required repainting for 10 to 15 years.
IT IS ABSOLUTELY WITHOUT AN EQUAL.

If you need any paint it will pay you to send for circular.

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

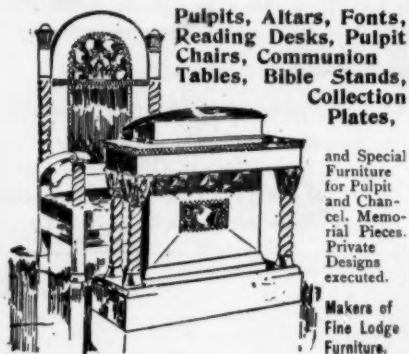


HILL'S Famous Clothes Dryers

For flats and yards of private dwellings. The most popular dryer in the world. Endorsed and specified by architects everywhere. More than 200,000 in use. Sold by the hardware trade. Order of your jobber or direct.

HILL DRYER CO., Worcester, Mass.

Send for Catalogue F



Pulpits, Altars, Fonts, Reading Desks, Pulpit Chairs, Communion Tables, Bible Stands, Collection Plates,

and Special Furniture for Pulpit and Chancel. Memorial Pieces. Private Designs executed.

Makers of Fine Lodge Furniture.

RETTING & SWEET, Makers, 11 B St., Grand Rapids, Mich.

ART GLASS WORK

ORIGINAL DESIGNS IN
Screens and Transoms, Glass Mosaic, Filigree Wire

Suggestions for Lighting in keeping with decoration. Figures furnished on Special Work

Chandler Specialty Mfg. Co.

138-140 Congress Street

Mr. Chandler formerly connected with Tiffany Glass Co., N. Y. Boston, Mass.

DRAWING



Artist and Artisan



is the title of an Artistic Brochure issued by the

Yale and Towne

Mfg. Company,

9-11-13 Murray St., New York City.

It deals with the origin of Ornamental Metal Work and its present development and uses. It will be sent to Architects on request.

8360-19

BOOKS:

"Croquis d'Architecture."
(Intime Club.)

XXII Year, complete. Price \$6.70.

A hiatus of ten years occurs between the date of the 21st and 22nd volumes.

AMERICAN ARCHITECT AND BUILDING NEWS CO.

Masonry in Modern Work.

A "PROLEGOMENOS" ON THE FUNCTION OF MASONRY IN MODERN ARCHITECTURAL STRUCTURES.

BY

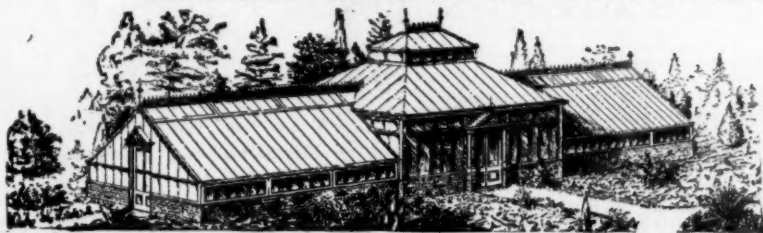
R. GUASTAVINO - - - Architect.

Price, Paper Cover - - 30 Cents.

FOR SALE BY THE

AMERICAN ARCHITECT.

HITCHINGS & CO., Established 50 years
HORTICULTURAL ARCHITECTS AND BUILDERS
and largest manufacturers of
GREENHOUSE HEATING AND VENTILATING APPARATUS.



The highest awards received at the World's Fair for Horticultural Architecture, Greenhouse Construction and Heating Apparatus. Conservatories, Greenhouses, Palmhouses, etc., erected complete with our Patent Iron Frame Construction.

Send four cents for Illustrated Catalogue.

233 MERCER STREET, N. Y. CITY.



GRILLES.

Original designs, beautifully Carved to fit any space.

Also Carved and Embossed Mouldings, Capitals, Newel Post Tops, Rope and Twist Balusters.

Waddell Manufacturing Co.

No. 3 Plainfield Ave. Grand Rapids, Mich., U.S.A.

Illustrated General Catalogue No. 18. Over 1,000 designs. mailed for ten cents in stamps.

Forget Not

that on completion of the twelfth part of

"The Georgian Period"

the work will become a net publication. If you value a discount buy the work before that time comes.



JENKINS BROTHERS' VALVES

Perfectly tight under all pressures of steam, oils or acids.
Warranted to give satisfaction under the worst conditions.

RECEIVED THE **GOLD MEDAL** AT THE PAN-AMERICAN EXPOSITION

Insist on having the genuine, stamped with Trade Mark.

JENKINS BROTHERS, New York, Boston, Philadelphia, Chicago.

WARREN'S TRINIDAD ASPHALT

ROOFING "ANCHOR BRAND" PAVING
THE BEST MATERIAL FOR

WARREN CHEMICAL & MFG. CO., 170 Broadway, N. Y.

CRANE VALVES

ESTABLISHED 1855

Smith's Shutterless Automatic Closing Fire-Proof Metal ... WINDOWS ...



Our sliding sashes can be made to pivot to permit cleaning from inside of building if desired.

Are the BEST FIRE-PROOF WINDOWS of ANY KIND in the world to-day.

They are absolutely FIRE and WEATHER PROOF. They SAVE INSURANCE, REQUIRE NO SHUTTERS, INCREASE and better DIFFUSE LIGHT, cannot be distinguished from the best woodwork, are the ONLY sliding sashes that

CLOSE AND LOCK AUTOMATICALLY

when subjected to a mild degree of heat, and are made in FOURTEEN DIFFERENT STYLES for OFFICE, HOTEL and APARTMENT buildings, FACTORIES, WAREHOUSES, Etc.

WE OPERATE NINE LARGE FACTORIES

Write for Catalogue and information to

SMITH-WARREN CO.

93 Federal St., BOSTON, MASS.

ELECTRIC HOUSE SERVICE PUMPS

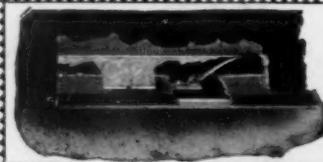
WILLIAM E. QUIMBY

[Incorporated]

141 Broadway, New York

CHICAGO
EDWARD YEOMANS
1141 MONADNOCK BLDG.

NEW ORLEANS
SAFETY ELECTRIC MFG. CO.
303 MAGAZINE ST.



YOUR CLIENT APPRECIATES

the best in his building. The Introstile, made entirely of metal with a felt buffer, will please him. It does away with thresholds, keeps out draughts, dust and odors, is handsome and inexpensive. Investigate its merits.

We will be pleased to send illustrated booklet.

The Introstile & Novelty Co.
Marietta, Ohio.

NATIONAL FIRE-PROOFING CO.

PITTSBURGH
PHILADELPHIA

NEW YORK

BOSTON
CHICAGO

ASPHALT FLOORS, ROOFS, SIDEWALKS AND CARRIAGE-WAYS

Of Public Buildings, Hospitals, Warehouses, Stables, Cellars, etc.

Laid with VAL de TRAVERS ROCK ASPHALT,
DURABLE, FIREPROOF AND IMPERVIOUS.

For estimates and list of works executed, apply to
THE NEUCHÂTEL ASPHALT CO., Limited,
306 BROADWAY - NEW YORK.

Conservatories, Greenhouses, Vineries, Etc.

Designed, erected and heated. Catalogue, also special plans and estimates, on application.

LORD & BURNHAM CO.,
1133 Broadway - New York City.



Boston Office: 48 Congress St., Room 24.

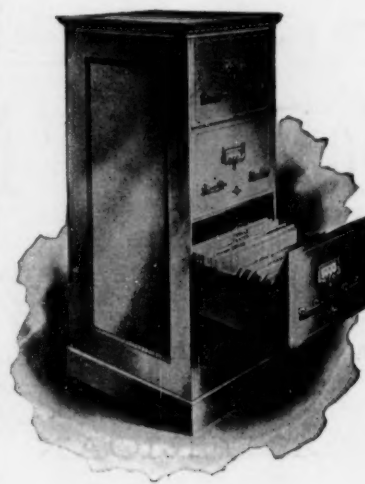
BOOKS:

"Empire Ornaments, Furniture, etc."

A reprint of the well-known work of
M. Charles Normand.

36 Plates. Price \$6.00.

AMERICAN ARCHITECT AND BUILDING NEWS CO.



STEEL VERTICAL FILES

..FOR..

ARCHITECTURAL PLATES

"Won't Burn"

Booklets on application:

"Steel Vertical Files"

"Types" of Metallic Fixtures

"Metallic Library Furnishings"

ART METAL CONSTRUCTION CO.
JAMESTOWN, N. Y.

Important Litigation Relating to Magnesia Covering Patents

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.

Beware of Fraudulent so-called "Magnesia" Coverings as well as those infringing on patents.

KEASBEY & MATTISON COMPANY AMBLER, PENNA.

New York Boston Chicago Washington Atlanta New Orleans

Cleveland Cincinnati Milwaukee

AUTHORIZED SELLING AGENTS

Boston . S. C. Nightingale & Childs
New York . Robert A. Keasbey
Philadelphia . Magnesia Covering Co.
Baltimore . Wallace & Gale
Richmond . Smith-Courtney Co.

Norfolk . Henry Walke Co.
Charleston . W. M. Bird & Co.
St. Louis . F. Bocler
Omaha . Spencer Otis
Kansas City . Spencer Otis

Chicago . Walch & Wyeth
Detroit . S. P. Conkling
San Francisco . DeSolla-Deussing Co.
Seattle . DeSolla-Deussing Co.

MASON SAFETY TREAD BEWARE OF INFRINGEMENTS

AMERICAN MASON SAFETY TREAD CO., BOSTON

PERSPECTIVES RENDERED

IN PEN-AND-INK AND WATER-COLOR,
WALTER M. CAMPBELL,
8 Beacon St., Boston, Mass.

E. ELDON DEANE,

Architectural Colorist and Draughtsman.
63 Seymour Building, Fifth Ave., cor. 43d St.
NEW YORK CITY.

BOOKS:

"The Library of Congress."

20 Plates, folio. Price \$5.00.

AMERICAN ARCHITECT AND BUILDING NEWS CO.

J. W. TAYLOR'S PHOTOGRAPH SERIES

151 MONROE ST., CHICAGO OF AMERICAN ARCHITECTURE
Removed to Owings Building.
Send two 5 cent stamps for Catalogue.

Quick Escape from

..FIRE..

is secured by means of our Patent Self-Locking
SCUTTLE OPENER

ALSO

Patent Sky Light Lift and Ventilating Sash Locks

Send for Descriptive Pamphlets

Geo. Bickelhaupt Skylight Works
243 and 245 West 47th St.

Tel. 675-38th.

NEW YORK



THEATRE VENTILATION

TO BE SUCCESSFUL MUST BE POSITIVE

The air must be distributed with the utmost refinement, the temperature must be automatically controlled and the vitiated air must be immediately removed.

The Fan System insures these results. It is the system which we have perfected during an experience of 30 years, and which we are completely equipped to design and install.

B. F. STURTEVANT CO.
BOSTON, MASS. NEW YORK CHICAGO PHILADELPHIA LONDON 314

FORGET NOT

that on completion of the twelfth Part of

"THE GEORGIAN PERIOD"

the work will become a net publication. If you value a discount, buy the work before that time comes.

"BENEDICT-NICKEL"
Seamless Tubing
for high-class exposed plumbing. "White metal clear through."
BENEDICT & BURNHAM MFG. CO.
Waterbury, Conn.
New York, 253 Broadway
Boston
172 High Street

KINNEAR
STEEL ROLLING
DOORS-SHUTTERS-
THE KINNEAR MFG. CO.
COLUMBUS OHIO U.S.A.
BOSTON - CHICAGO - PHILA.
65 WATER ST. - 112 CLARK ST. - 141 CHESTNUT ST.

Put into the White House by the U. S. Government.
SEALS WITH OR WITHOUT WATER
CUELL TRAP
S. S. S. R.
For venting, use vent-top. For venting, use vented outlet.
F. E. CUELL'S
PATENT SEWER-GAS AND BACK-WATER TRAP,
For Wash-Bowls, Sinks, Bath and Wash-Tub.
West Cleveland, O.

BUILDING INTELLIGENCE.

(Advance Rumors Continued.)

Huron, S. D.—A. W. Cole, 204 Dearborn St., Chicago, is at work on plans for the buildings for Huron College. They will cost between \$40,000 and \$50,000.

Jamestown, N. Y.—Plans are being prepared for a parochial school in this city to cost \$30,000. Plans by E. B. Bergholtz, architect.

Kalamazoo, Mich.—The Riverview Coating Paper Co. has been organized with a capital stock of \$125,000 for the erection of a factory building.

Kansas City, Mo.—A \$300,000 seven-story building will be erected on Baltimore Ave. by the Western Methodist Book Concern.

Linton, N. D.—It is reported that a \$20,000 hotel building will be erected.

Malden, Mass.—Announcement is made that the Rev. Sedgwick Martyn, of the First Unitarian Church Society will erect a new modern church edifice as a memorial to his two deceased sons. Owner proposes to equip same for social, physical and industrial work, and will enter into the project for twenty years.

McDonald, Pa.—McCallum & Dowler, Bank for Savings Building, are preparing plans for a new church for the United Presbyterian congregation, to be erected at a cost of \$20,000.

McKeesport, Pa.—Plans have been drawn by J. P. Bailey, 435 Fourth Ave., Pittsburgh, for a \$20,000 brick Jewish synagogue to be erected at Market and 3d Sts.

Mitchell, S. D.—Fred Wiedmann will have work begun at once for his new hotel building. Cost, \$35,000.

Monson, Mass.—A comfortable and commodious nurses' home is to be built at the Massachusetts Hospital for Epileptics. The building is to be of brick, with slate roof, from plans by Kendall, Taylor & Stevens, of Boston.

Nevada, Ia.—About \$300,000 will be expended in replacing the north wing of the Iowa Agricultural College, which was destroyed by fire in 1900. Plans have been drawn and approved.

New Prague, Minn.—The Catholic Society is raising funds for a \$50,000 church.

New York, N. Y.—Payne Whitney's house, to be built at 972 Fifth Ave., for his own occupancy, will cost about \$195,000. McKim, Mead & White are the architects. The house will be six stories high. The front will be of white marble and granite and the roof will be mansard.

Plans have been drawn for a five-story and basement brick school, to be erected at 543 to 551 W. 120th St. The trustees of Teachers College are the owners. Parish & Schroeder, 3 W. 29th St., are the architects. The building is to be used as a physical culture school and adjoins the new Horace Mann School. The front will be of brick and Long Meadow Stone, trimmed with marble. A cupola will be on one end of the building. The cost is placed at \$200,000.

The Century Realty Co., of which W. H. Chesbrough is president, has practically decided to build an eighteen-story office building on its plot on the north side of 34th St., 10 feet west of 5th Ave.

Plans have been filed for a nine-story brick apartment hotel to be erected on the south side of 5th St., near 8th Ave. J. D. Matthews, of No. 422 St. Nicholas Ave., is the owner. Ross & McNeil, of

HALF ENOUGH WATER
is quite enough for some people, but most people want water every day. If
Rider or Ericsson Hot-Air Pumps
are used you can have water every day in the year, and your cook or stable-boy is the only engineer needed. 25,000 in daily use.
Catalogue "B" on application to nearest store.
RIDER-ERICSSON ENGINE CO.
35 Warren St., New York.
239 Franklin St., Boston.
692 Craig St., Montreal, P. Q.
40 Dearborn St., Chicago.
40 N. 7th St., Philadelphia.
Teniente Rey 71, Havana.
22a Pitt St., Sydney, N. S. W.

CRANE FITTINGS
ESTABLISHED 1855

Telephone Call, 1481 John

HENRY S. NORTHROP, Manufacturer of

Special attention to deep panels, curved work, etc., to architect's designs.

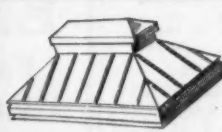
Stamped Steel Ceilings

40 Cherry St., New York

Also Room 74, EQUITABLE BUILDING, BOSTON.

Sheet Metal Skylights

OUR leading specialty is the METAL SKYLIGHT in its highest development, which we build to suit every possible condition of location and service. Now, "highest development" means, with us, a construction that forbids leakage, dripping or sweating, and is both self-ventilating and fire-proof.



WE will be pleased to mail you, without charge, our finely-illustrated catalogue "B" which will throw a deal of light on the "skylight question" for you.

Van Noorden Company,
944 Massachusetts Avenue, BOSTON, MASS.

BUILDING INTELLIGENCE.

(Advance Rumors Continued.)

No. 39 E. 42d St., are the architects. The cost is placed at \$20,000.

Plans have been filed at the Bureau of Buildings for a twelve-story brick hotel, to be erected on the south side of 77th St., near Columbus Ave. The West Side Construction Co., of 264 Broadway, is the owner. George F. Pelham, of 503 Fifth Ave., is the architect. Estimated cost, \$100,000.

H. G. Williams and Sylvanus Stokes, both business men of Norfolk, Va., have leased land, signed contracts and accepted plans for a fourteen-story fireproof hotel, to be erected at the southwest corner of 36th St. and 7th Ave. This new hotel, which will be known as the York, will cost \$1,000,000.

Alterations will be made to the Harvard Club, situated at 27 W. 44th St. They consist of building an extension on the rear of the present building, to be used as a club-house and assembly hall. The extension will be three stories high, the same as the main building. Cost, \$100,000. McKim, Mead & White are the architects.

Columbia University has received an offer anonymously to equip a university press in the vicinity of the university to print the undergraduate publications. The cost is estimated at \$25,000.

Northampton, Mass.—Architects Ellsworth & Kirkpatrick, of Holyoke, have revised plans ready to figure for a new cattle barn to be erected at the asylum for the insane here. The present barn will be remodelled and the work will cost \$15,000.

Oriskany Falls, N. Y.—Hatheway & Reynolds intend to build a new factory this fall, which will give room to take care of their increasing business.

Ottawa, Kan.—The \$50,000 main building of the Ottawa University was destroyed by fire on the 10th inst. Insurance, \$20,000. Plans will be perfected for a new and larger building, to be erected at once.

Paducah, Ky.—The construction of a filtration plant, to cost about \$100,000, is contemplated by the city. E. T. Washington, city engineer.

Philadelphia, Pa.—Preparations are being made for the erection of a new mill by S. B. & B. W. Fleisher, manufacturers of yarn.

Pittsburgh, Pa.—Sidney F. Heckert, Stevenson Building, is drawing plans for a brick and stone church, 93' x 130', to be erected by the Poles of this city, at a cost of \$70,000.

Portsmouth, Va.—A report says that Philadelphia parties have purchased site here for a \$350,000 textile mill. No names have as yet been obtained for publication, but it is known that 100 acres of land are being negotiated for.

Providence, R. I.—Paul Bajnotti, Italian consul general at Liverpool, Eng., has offered to erect on the campus of Brown University a tower clock, to

BUILDING INTELLIGENCE.

(Advance Rumors Continued.)

cost not less than \$30,000, in memory of his wife, Carrie B. Bajnotti.

Richmond Hill, L. I.—As soon as an extension to the Johnson Ave. school building has been completed a portion of the old building will be taken down and a new \$100,000 school-building erected.

Salem, Mass.—A site has been purchased on Union St. and plans are being drawn for a new Polish Catholic Church.

Sedalia, Mo.—A \$25,000 store building is to be erected to replace the old Grand Central recently destroyed by fire.

Sheridan, Wyo.—Bids are being taken for the erection of four new buildings at Fort Mackenzie. Cost, \$175,000.

South Hadley, Mass.—The competitive plans by Architects Putnam & Cox, 6 Hancock Ave., have been selected for the proposed new Gaylord Memorial library. It will be a brick and stone structure, one-story high.

South Huron, S. D.—A. W. Cole, 204 Dearborn St., Chicago, has made preliminary drawings for the buildings for Huron College. The proposed structures will cost between \$40,000 and \$50,000.

Swampscott, Mass.—James H. Phelps, of Boston, is preparing to erect a handsome residence, said to cost upwards of \$20,000, on Atlantic Ave. The site has been laid out by Civil Engineer Fred H. Eastman.

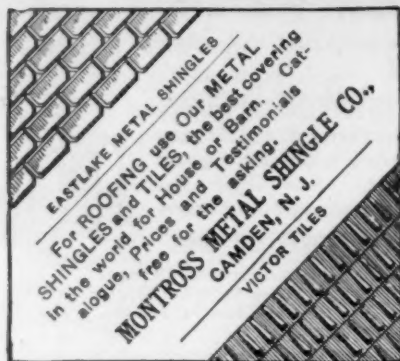
Utica, N. Y.—A fire in the plant of the Utica Excelsior Co. destroyed the building and caused a loss of about \$20,000. It is stated that about \$10,000 insurance was carried upon the plant, which will leave a net loss of about \$10,000 to the company. It is probable that the plant will be rebuilt upon the old site as soon as the fire loss has been adjusted.

Webster, Mass.—B. A. Corbin & Sons Co., shoe manufacturers, want estimates for installing a sprinkling system and other improvements for the New England Insurance Exchange.

Winchester, Mass.—Architect Herbert D. Hale, 15 Exchange St., has been selected to draw plans for the proposed new high school to be erected here. The building will be brick and stone, contain 11 class rooms, gymnasium, lavatory, library and offices, and cost \$110,000.

ALTERATIONS AND ADDITIONS.
Roxbury, Mass.—Dudley St., cor. Magazine St., 2 four-story additions, 8' x 81' & 34' x 36', comp. roofs; \$17,000; O., Home for Aged Couples; a., F. Jos. Uttersee.

APARTMENT-HOUSES.
Cambridge, Mass.—Massachusetts Ave., cor. Dana



EASTLAKE METAL SHINGLES
For ROOFING use Our METAL SHINGLES and TILES, the best covering in the world for House or Barn. Catalogue, Price and Testimonials along, free for the asking.
MONTROSS METAL SHINGLE CO.,
CAMDEN, N. J.
VICTOR TILES



Architectural Sheet Metal Ornamental Work
Cornices, Skylights
Tile Roofing
Statuary
Send for illustrated catalogue.
Architects' special designs accurately produced in sheet metal.
Write for our prices.
W. H. MULLINS
107 Depot St.
SALEM, - OHIO

PASSAIC ROLLING MILL CO.,
PATERSON, N. J.
Steel Beams 4 inches to 20 inches deep.
ALL STRUCTURAL SHAPES.
NEW YORK OFFICE . . . 45 BROADWAY.
Boston Office, No. 31 State Street.

J. S. THORN CO.
Architectural Sheet-Metal Works
Metal Building Trimmings, Ventilating Skylights, Metallic Roofing Tiles, Building Specialties, Builders' Light Iron Work of every description.
Nos. 1225 to 1229 Callovhill Street
PHILADELPHIA, PA.

YOUR PLANS should include Lockers and you should specify
Expanded Metal
Cleanest, Safest, Best, Strongest
MERRITT & CO.
1011 Ridge Ave.
Philadelphia

BUILDING INTELLIGENCE.
(Apartment-Houses Continued.)
St., Ward 8, seven-st'y bk. & st. apart.; \$30,000; o. & a., Harry Dustin Joll.
New York, N. Y.—Lexington Ave., cor. 46th St., six-st'y bk. flat & stores, 40' x 90' 5"; \$45,000; o., Max Kessler, 113 Attorney St.; a., G. F. Peilham, 593 5th Ave.
Jennings St., cor. Chisholm St., five-st'y bk. flat & store, 25' x 65'; \$22,000; o., H. Kirk & J. Graham, 227 Southern Boulevard; a., Harry T. Howell, 138th St. & 5d Ave.

EDUCATIONAL.
New York, N. Y.—Central Park West, cor. 63d St., five-st'y & base, bk. & st. school, 100' x 119', composition roof; \$500,000; o., Society for Ethical Culture of New York, 48 E. 58th St.; a., Kohn, Carrère & Hastings, 28 E. 41st St.; b., Marc Eidlitz, 489 Fifth Ave.
Summit, Ill.—Two-st'y bk. school, 80' x 114', slate roof, steam; \$20,000; a., W. G. Krieg, 84 Washington St.

FACTORIES.
Brooklyn, N. Y.—Agoe St., nr. Manjer St., two-st'y bk. factory, 74' 8" x 75', gravel roof; \$20,000; o., Schmidt & Co., on premises; a., Huberty & Hudson, Broadway & S. 8th St.
New York, N. Y.—Twelfth Ave., nr. 55th St., six-st'y bk. factory, 75' x 89', gravel roof; \$35,000; o., Ruth A. Wallace, Amesbury, Mass.; a., Hy. Davidson, 240 W. 20th St.

HOSPITALS.
Brooklyn, N. Y.—Fourth Ave., cor. 46th St., three-st'y bk. hospital, 49' x 60' 8", tile roof, steam; \$100,000; o., Norwegian Lutheran Home & Hospital, on premises; a., Hill & Stout, 1123 Broadway, N. Y.

HOUSES.
Brooklyn, N. Y.—New Utrecht Ave., cor. 70th St., two-st'y fr. store & dwell., 20' x 58'; \$4,500; o., J. L. Nostrand, 20th & Croysey Aves.



A. C. Harrison Building
Philadelphia, Pa.

STRUCTURAL STEEL

FOR EVERY PURPOSE

BUILDINGS
BRIDGES
ROOFS
TRUSSES

American Bridge Company
100 BROADWAY
NEW YORK
OF NEW YORK

ENGINEERS AND CONTRACTORS

EXPANDED METAL

For Fireproofing and Concrete Construction
ASSOCIATED EXPANDED METAL COMPANIES Room 1209, 256 Broadway
NEW YORK

13 TERRACE BUFFALO, N. Y. **ROBERT A. KEASBEY** 83 WARREN ST. NEW YORK CITY
LITH WALL AND FLOOR INSULATION
FIBRE FELT AND ROCK FIBRE WOOL DEADENING
MAGNESIA BUILDING LUMBER (Magnesia-lith)
MAGNESIA FLAWLESS FLOORS (Magnesia-lith)
ASBESTOS BUILDING PAPERS, ROOFING AND MINERAL WOOL

BUILDING INTELLIGENCE.

(Houses Continued.)

E. Sixteenth St., nr. Avenue B, two-st'y & attic fr. dwell., 28' x 39', shingle roof; \$5,000; o., G. W. Egbert, 126 E. 19th St.; a., A. D. Isham, 220 Broadway, N. Y.
54th Ave., cor. Bay 26th St., two-st'y & attic fr. dwell., 27' x 50' 10", shingle roof; \$6,000; o., C. M. Zimmerman, Bay 28th St., nr. Croysey Ave.; a., C. Schubert, 1832 Bath Ave.

Dorchester, Mass.—Hove St., nr. Dorchester Ave., two-st'y fr. dwell., 29' x 39', shingle roof, furnace; \$6,500; o., J. P. Trauer; a., Wm. Besarick.
Tonaucanda St., No. 62, two-st'y fr. dwell., 32' x 48', shingle roof, furnace; \$5,700; o. & b., G. L. Davidson, 63 Greenwood St.

Worcester, Mass.—Amherst St., two-st'y fr. dwell., 27' x 47', pitch roof, steam; \$5,000; o., H. Ward Moore, 27 Amherst St.; b., W. F. Simonds, 40 Chilton St.

Stoneland Road, 2½-st'y fr. dwell., 36' x 40'; \$5,000; o., J. B. Scrimgeour, 513 Main St.; b., C. E. Anderson, 59 Kendall St.; a., J. P. Kingston, 518 Main St.

OFFICE-BUILDINGS.

New York, N. Y.—Hudson St., cor. Franklin St., ten-st'y bk., st. & terra-cotta office-building, 65' 11" x 75' 2", felt & gravel roof; \$185,000; o., Borden Condensed Milk Co., 71 Hudson St.; a., G. Howard Chamberlin, 1181 Broadway; b., Andrew J. Robinson, o., 123 E. 23d St.
Westchester Ave., cor. Bergen Ave., three-st'y bk. office & store building, 159' 3" x 32' 8" x —, plastic slate roof; \$60,000; o., Franklin A. Wilcox, 1 Broadway; a., Arthur Arcetander, 520 Willis Ave.

MISCELLANEOUS.

Cambridge, Mass.—Massachusetts Ave., cor. Vassar St., Ward 6, two-st'y st., bk., iron & fr. armory; \$150,000; o., City of Cambridge; a., Hartwell, Richardson & Driver.

PROPOSALS.

SEWERS. [At Quincy and Roxbury, Mass.]
Proposals will be received at office of Metropolitan Water & Sewerage Board, 1 Ashburton Pl., Boston, until October 1 for building sections 45 and 78 of High Level Sewer in Quincy and Roxbury respectively. Plans at said office or office of engineering department, Pemberton Building, Boston. 1395

REPAIRING WALL. [At Savannah Harbor, Ga.]
U. S. Engineer Office, Savannah, Ga. Sealed proposals for repairing and adding to Mackay's Point Training Wall, Savannah Harbor, Ga., will be re-

PROPOSALS.

ceived at this office until September 27, 1902. Specifications, blank forms and all available information will be furnished on application to this office. CASSIUS E. GILLETTE, captain, engineers. 1395

LIBRARY. [At Jerseyville, Ill.]
Bids for the erection of the Carnegie free public library at Jerseyville will be received by the building committee until September 29. A. N. Embley, architect. Ed. J. Vaughn, secretary building committee. 1395

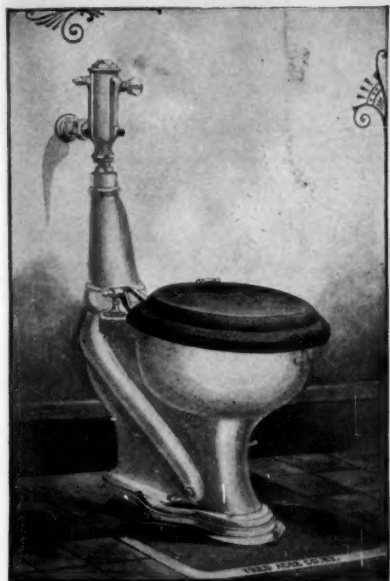
ROOF FOR CAPITOL. [At Des Moines, Ia.]
Bids will be received until September 29 by the capitol commission, State of Iowa, for a tile and acinolite roof on the capitol building, with copper work incident thereto. A. B. FUNK, CHARLES A. CUMMINGS, E. P. SCHOENTGEN, commissioners. 1395

HEATING AND VENTILATING. [At Pontiac, Ill.]
Bids will be received by the board of managers of the Illinois State Reformatory at the office of the State architect, Room 805, 305 Dearborn St., Chicago, until September 27 for the installation of a heating and ventilating apparatus in connection with the reconstruction of the north cell-house and school building. Robert Bruce Watson, supervising architect of the State of Illinois. G. DeF. KINNEY, chairman of building committee. 1395

ADDITION. [At Columbus, O.]
Proposals are wanted until September 26 for the erection of an addition to the Chemical building and for erecting a veterinary building. ALEXIS COPE, secretary board of trustees of the Ohio State University, Columbus. 1395

BUILDINGS. [At Fort D. A. Russell, Wyo.]
Denver, Col. Sealed proposals will be received here until October 6, 1902, for constructing five buildings, officers' quarters, barracks, stable and gunshed at Fort D. A. Russell. Information furnished on application to Q. M., Fort D. A. Russell, Wyo., or the undersigned. LIEUT. COL. J. W. POPE, U. S. M. 1396

MASONRY, ETC. [At Cascades, Ore.]
U. S. Engineer Office, Portland, Ore. Sealed proposals will be received here for placing cut stone, concrete and rubble masonry and doing necessary grading in connection with improving Columbia River



Fred Adee Co.'s

THE CYGNET

WITH

ZENITH VALVE

(Patent Applied for)

THE operation of this Water Closet is such as to **instantaneously remove the contents of the bowl** in advance of the wash from the flush rim, avoiding the agitation or churning process. It draws inward the air contained in the bowl and in the upper limb and forces it into the soil pipe. As shown, it is intended for use where water is supplied from tank in upper part of building, but without the valve may be used with same result from ordinary cistern overhead. It is a new idea and a great improvement which those interested are invited to see. We cannot take it to you, but will be pleased to have you call and examine, and, if you please, criticise it.

FRED ADEE CO.

90 BEEKMAN STREET

NEW YORK

REMEMBER

that each part of "THE GEORGIAN PERIOD" has been made better than its predecessors

Old Joints

and threads in pipe fittings often break when detached. This would not be the case if sealed in the fitting with

Wisconsin Graphite Pipe Joint Paste

which prevents corrosion and lengthens the life of all pipe joints.

Write for free sample and full particulars.

WISCONSIN GRAPHITE CO.,
Address Box No. 23, North Side
PITTSBURG, PA.

THE ARTIST

An Illustrated Monthly Record
of Arts, Crafts, and Industries

35 Cents. Yearly, \$3.50

A beautifully illustrated Magazine, which covers in its survey the field of Art in European countries and is devoted to the Arts and Crafts' movement in America.

THE DIAL

"THE ARTIST is one of the best of the art journals."

THE CRITIC

"THE ARTIST is a handsome cosmopolitan magazine, very profusely illustrated."

THE ARGUS

"One of the handsomest magazines published is THE ARTIST."

LITERARY WORLD

"... Handsome and engaging candidate for the favor of those whose tastes or occupations center in the world of applied art. . . . We recommend it warmly to all art students and to all artisans who desire to rise in their professions."

BOOK AND NEWSDEALER

"We see in THE ARTIST a publication of constantly increasing merit. The classically artistic exterior is the equal of anything we have seen."

PUBLISHED BY
TRUSLOVE HANSON & COMBA Ltd.
67 Fifth Avenue, New York

THE LIBRARY of CONGRESS,

WASHINGTON, D. C.

Architects: Smithmyer & Pelz:

P. J. Pelz; E. P. Casey.

Twenty Gelatine Plates, in Portfolio
14" x 16 1-2".

PRICE - - \$5.00.

AMERICAN ARCHITECT AND BUILDING NEWS CO

BOOKS:

"Architectural Masterpieces of Belgium and Holland."

96 Plates, quarto. Price \$10.00.

AMERICAN ARCHITECT AND BUILDING NEWS CO.

PROPOSALS.

Building, Chattanooga, Tenn., until October 8 for the construction, plumbing, heating and gas piping of about 65 frame buildings constituting the new military post to be built at Chickamauga Park. H. J. SLOCUM, captain cavalry, quartermaster. 1396

Treasury Department, Office of the Supervising Architect, Washington, D. C., September 16, 1902. Sealed proposals will be received at this office until 2 o'clock P. M. on the 9th day of October, 1902, and then opened, for safety vaults and work incidental thereto, in the Bureau of Engraving and Printing, U. S. Treasury Department, Washington, D. C., in accordance with drawings and specifications, copies of which may be had on application to this office, at the discretion of the Supervising Architect. JAMES KNOX TAYLOR, Supervising Architect. 1396

COMPLETION OF MESS HALL. [At West Point, N. Y.] West Point, N. Y. Sealed proposals will be received here until November 1, 1902, for completion of the cadet mess hall as per plans in this office. Forms and specifications furnished upon application. Address Q. M., U. S. M. A. 1397

STEEL. [At Yellowstone Park, Wyo.] U. S. Engineer Office, Yellowstone Park, Wyo. Sealed proposals will be received here until October 15, 1902, and then opened, for furnishing steel for 30 highway bridges in the Yellowstone National Park. Information furnished on application to this office. 1397

PROPOSALS.

at Cascades, Ore., until October 8, 1902. Information on application. W. C. LANGFITT, captain, engns. 1396

SCHOOL. [At Forrest, Ill.] Bids for the erection of a \$25,000 10-room school building will be received by the Secretary of the Board of Education. Reeves & Baillie, Y. M. C. A. Building, Peoria, architects. 1396

LIBRARY. [At Austin, Minn.] John H. Anderson, secretary of library board, will receive bids until October 7 for the erection of the Carnegie library at Austin. Kinney & Detweiler, architects. 1396

PROPOSALS.

COURT-HOUSE. [At Miami, Fla.] Sealed proposals for erecting a court-house will be received by E. C. Dearborn, clerk of the circuit court until October 7. Plans and specifications can be seen at the office of Wilson & Edwards, architects, Columbia, S. C. GEO. W. LAINHART, chairman board county commissioners. 1396

PLUMBING AND HEATING. [At Chickamauga Park, Ga.] Bids will be received at the office of the constructing quartermaster, Custom-house and Post-office

The Heliotype Printing Co.

LITHOGRAPHERS, ETC.

211 Tremont Street
Boston

FAC-SIMILE REPRODUCTIONS IN COLOR
OR MONOCHROME A SPECIALTY



Lithography
Heliotype
Color Printing
Photogravure
Maps, Plans, etc.

BEST WORK ONLY
PROMPT DELIVERY
REASONABLE PRICES

WRITE FOR ESTIMATES

PROPOSALS.

PAVEMENT.

[At Washington, D. C.]
Sealed proposals will be received at the Bureau of Yards and Docks, Navy Department, Washington, until October 11, 1902, for constructing 80,000 square feet, more or less, of asphalt pavement at the navy yard, Mare Island, Cal. Plans and specifications can be seen at the bureau or will be furnished by the commandant of the navy yard named. MORDECAI T. ENDICOTT, chief of bureau. 1397

SCHOOL.

[At Deadwood, S. D.]
Proposals will be received September 29 for an eight-room school to be erected in the 1st Ward. JOB LAFRENSON, Secretary Board of Education. 1395

GUARD-HOUSE, OFFICERS' QUARTERS, ETC.

[At Fort Mott, N. J.]
Sealed proposals for furnishing material and labor in constructing guard-house, frame coal shed and one double frame N. C. O. quarters here, will be received until September 30, 1902. Information furnished on application. QUARTERMASTER, Fort Mott, N. J. 1395

PROPOSALS.

BUILDING.

[At Washington, D. C.]
Department of the Interior, Washington, D. C. Sealed proposals will be received at the department until the 1st day of October, 1902, for the construction of an administration building called building "A"; for an addition to the Toner building kitchen; for the erection and completion of a central power and heating plant; electric power plant, power-house, chimney and tunnels for the Government Hospital for the Insane at Washington, D. C., in accordance with the drawings and specifications, copies of which specifications and form of proposal may be had, and the drawings seen, on application at this department. THOS. RYAN, acting secretary. 1395

BUILDING.

[At League Island, Pa.]
Sealed proposals will be received at the Bureau of Yards and Docks, Navy Department, Washington, until October 11, 1902, and then and there publicly opened for constructing a brick and steel building at the navy yard, League Island, Pa. Appropriation now available, \$214,000. Plans and specifications can be seen at the Bureau or will be furnished by the commandant of the navy yard named upon deposit of

PROPOSALS.

\$15 to secure their return. MORDECAI T. ENDICOTT, chief of bureau. 1395

Treasury Department, Office of the Supervising Architect, Washington, D. C., September 3, 1902. Sealed proposals will be received at this office until 2 o'clock P. M. on the 7th day of October, 1902, and then opened, for the construction (except heating apparatus, electric wiring and conduits) of the U. S. Post-office at Joplin, Missouri, in accordance with the drawings and specification, copies of which may be had at this office or the office of the Postmaster at Joplin, Mo., at the discretion of the Supervising Architect. JAMES KNOX TAYLOR, Supervising Architect. 1395

Treasury Department, Office of the Supervising Architect, Washington, D. C., September 9, 1902. Sealed proposals will be received at this office until 2 o'clock P. M. on the 10th day of October, 1902, and then opened for the installation of a conduit and electric wiring system for the U. S. Post-office and Court-house at Elmira, N. Y., in accordance with the drawings and specification, copies of which may be obtained at this office or at the office of the Superintendent of Construction at Elmira, N. Y., at the discretion of the Supervising Architect. JAMES KNOX TAYLOR, Supervising Architect. 1395

MINERAL WOOL

FIRE, SOUND and VERMIN PROOF INSULATOR.

Samples and Circulars Free.

U. S. Mineral Wool Co., 143 Liberty Street,
NEW YORK.

"Italian Renaissance Doorways"

104 PLATES, 10 x 14 1-2 inches

Uniform with the second Volume ["Door and Window Grilles"] of the Topical Architecture Library.

Price, bound in Cloth . . . \$7.50
" in Portfolio . . . 6.50

American Architect and Building News Co., Publishers
211 Tremont Street, Boston

NEW ENGLAND MATERIAL-MEN AND CONTRACTORS.

BLUE PRINTING. B. L. MAKEPEACE, 345 Washington St., Boston, Mass. CHAS. E. MOSS, Rapid Printing Papers, 38 Broad St., Boston. Telephone: Boston, 2751-2.	ROOFING DUCK. C. H. BATCHELDER & CO., 234 State St., Cor. India St., Boston, Mass.
CONTRACTOR & BUILDERS. WILLIAM L. RUTAN, 1016 Tremont Bldg., Boston.	SASH CORD. SILVER LAKE CO., 78 Chauncy St., Boston.
DOORS, WINDOWS, ETC. E. A. CARLISLE, POPE & CO., 2 Sudbury St., Boston, Mass.	SEAM-FACE GRANITE. GILBRETH SEAM-FACE GRANITE CO., Park Row Building, New York 85 Water St., Boston.
FIRE-ESCAPES. STANDARD FIRE-ESCAPE & MFG. CO., 120 Milk St., Boston, Mass.	STABLE FIXTURES. BROAD GAUGE IRON STALL & VANE WORKS, 53 Elm St., Boston, Mass.
PORTABLE OVENS. H. A. JOHNSON & CO., 224 State St., Boston, Mass.	STONE CARVING AND MOD ELLING. HUGH CAIRNS, 48A Sudbury Street, Boston.
	WATERPROOF CELLARS. FRANK B. GILBRETH, Park Row Bldg., New York. 176 Federal St., Boston.

Professional Ethics.

The following . . .
 . . . CODE OF ETHICS . . .
 Prepared in Conformity with the
 Best Standards of Practice, and
 Recommended to its Members by
 the Boston Society of Architects,
 WAS

ADOPTED BY THE SOCIETY, FEBRUARY 1.
 . . 1895. . .

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

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

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

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

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

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

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

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

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

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

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

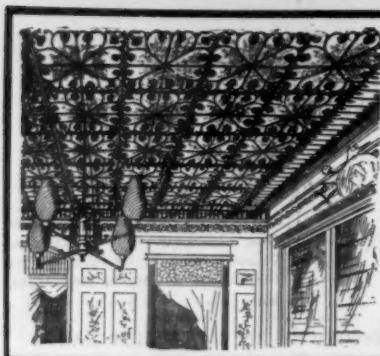
SECTION 12. The American Institute of Architects' "schedule of charges" represents minimum rates for full, faithful and competent service. It is the duty of every architect to charge higher rates whenever the demand for his services will justify the increase, rather than to accept work to which he cannot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

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

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

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

SECTION 16. A Member should so conduct his practice as to forward the cause of professional education and render all possible help to juniors, draughtsmen and students.



Berger's *Classic* Metal Ceilings

Are symmetrical and pleasing to the eye and command the admiration of all. They can be used in all classes of buildings, are easy to apply, and highly ornamental. They don't shrink, crack, get water-soaked or fall off. They are safe and sanitary. Their durability makes them the most economical ceilings in existence. Our "Classified designs" embrace a variety of styles, and there is no building that we cannot match in its style of architecture. Send for our booklet "A New Idea in Metal Ceilings"—'tis free.

THE BERGER MFG. CO., CANTON, O.

Eastern Branch—210 E. 23d St., N. Y.

Western Branch—19-21 S. Main St., St. Louis, Mo.

THE Northwestern Terra-Cotta Co. Manufacturers of **Architectural Terra-Cotta.**

WORKS & MAIN OFFICE:
Cor. Olybourn & Wright
wood Avenues.

CITY OFFICES:
Room 1118 Rockery Bldg.
cor. La Salle & Adams St.

CHICAGO.

Estimates given on application. Send for Catalogue and Samples.

PERTH AMBOY TERRA-COTTA COMPANY,

—OF—
PERTH AMBOY, NEW JERSEY.

OFFICE, 160 Fifth Ave., NEW YORK.

BOSTON AGENTS.

WALDO BROS., 102 MILK STREET.

BRONZE

JNO. WILLIAMS
BRONZE FOUNDRY AND WORKS
WROUGHT IRON WORKS
544 to 556 WEST 27th STREET, NEW YORK

WROUGHT IRON

"Topical Architecture"

Classified Architectural Motives and Details.

Published Monthly.

NUMBER.

1. Renaissance Doorways.—I.
2. Renaissance Doorways.—II.
3. Renaissance Capitals.—I.
4. Renaissance Capitals.—II.
5. Iron Gates and Railings.—I.
6. Iron Gates and Railings.—II.
7. Renaissance Chimneypieces.
8. Tombs.
9. Arabesques.
10. Sgraffito.
11. Ecclesiastical Domes.—I.
12. Ecclesiastical Domes.—II.
13. Renaissance Cornices.—I.
14. Iron Gates and Railings.—III.
15. Iron Gates and Railings.—IV.
16. Ecclesiastical Domes.—III.
17. Lions.—I.

NUMBER.

18. Ecclesiastical Domes.—IV.
19. Renaissance Pulpits.
20. Ecclesiastical Domes.—V.
21. Renaissance Capitals.—III.
22. Iron Gates and Railings.—V.
23. Renaissance Cornices.—II.
24. Fonts and Stoups.—I.
25. Iron Gates and Railings.—VI.
26. Renaissance Capitals.—IV.
27. Eagles.
28. Ecclesiastical Domes.—VI.
29. Gates and Railings.—VII.
30. Domical Buildings.—VII.
31. Fonts and Stoups.—II.
32. Wells and Fountains.—I.
33. Lions.—II.

40 cents per copy. 3 copies, \$1.00. Per year, \$3.00.

AMERICAN ARCHITECT AND BUILDING NEWS CO.

[See Alphabetical Index on Cover 2 for Pagination.]

CLASSIFIED ADVERTISEMENTS.

[Advertisers can be indexed only under a single head free of charge.]

ARCHITECTURAL METALWORK.

Mullins, W. H., Salem, O.

ART GLASS WORK.

Chandler Specialty Mfg. Co., Boston.

ART METALWORK.

Art Metal Construction Co., Jamestown, N. Y.

Ludlow Saylor Wire Co., St. Louis, Mo.

ARCHITECT'L ORNAMENTATION.

Lombard & Co., A. P., Boston.

ASPHALT.

Neuchatel Asphalt Co., New York.

ASPHALT ROOFING.

Warren Chemical & Mfg. Co., N. Y.

BLUE PRINTS.

Makepeace, B. L., Boston.

Moss, Chas. E., Boston.

Spaulding Print Paper Co., Boston.

BOILER (Steam and Hot-Water).

Walker & Pratt Mfg. Co., Boston.

BOILERS (Side-Feed).

Gorton & Lidgerwood Co., New York.

BRICKS (Red Oxide).

Wisconsin Graphite Co., Pittsb'g, Pa.

CAPITALS.

Lombard & Co., A. P., Boston.

CAPITALS (Carved).

G. T. Nelson Co., The, Columbus, Ohio.

CARVING.

Lombard & Co., A. P., Boston.

Waddell Mfg. Co., Grand Rapids, Mich.

CEMENT.

Alsen's Cement Works, N. Y.

Atlas Cement Co., New York.

CLOTHES-DRYER.

Hill Dryer Co., Worcester, Mass.

COMPOSITION ORNAMENT.

Lombard & Co., A. P., Boston.

CONDUCTORS.

American Steel Roofing Co., The, Cincinnati, Ohio.

CONSERVATORIES.

Lord & Burnham Co., Irvington-on-Hudson, N. Y.

CONTRACTING.

Flynt Building & Construction Co., Palmer, Mass.

Rutan, William L., Boston.

CONTRACTOR AND BUILDER.

Rutan, William L., Boston.

CORDAGE.

Samson Cordage Works, Boston.

CREOSOTE STAINS.

S. Cabot, Boston.

CUTLER PAT. MAILING SYSTEM.

Cutler Mfg. Co., Rochester, N. Y.

DEAFENING QUILT.

Samuel Cabot, Boston, Mass.

DOORS (Steel Rolling).

Kinnear Mfg. Co., The, Columbus, O.

DOORS, WINDOWS, ETC.

Carlisle, Pope & Co., E. A., Boston.

DRAUGHTSMAN.

E. Eldon Deane, New York.

ELECTRIC SIGNALS.

Elevator Supply & Repair Co., New York.

ELEVATORS, ETC.

Morse, Williams & Co., Philadelphia.

Whittier Machine Co., Boston.

ELEVATOR SIGNALS.

Herzog Teleseme Co., New York.

ENGINES (Hot-Air).

Rider-Ericsson Engine Co., New York.

EXPANDED METAL LOCKERS.

Merritt & Co., Philadelphia, Pa.

FAN SYSTEM.

Sturtevant Co., B. F., Boston, Mass.

FILING DEVICES.

Art Metal Construction Co., Jamestown, N. Y.

FILTER.

Loomis-Manning Filter Co., Phila., Pa.

FIREPROOFING.

Associated Expanded Metal Co., New York.

National Fireproofing Co., Pittsburg, Pa.

FIRE-ESCAPES.

Standard Fire escape & Mfg. Co., Boston.

FIREPROOF LATHING.

Hayes, Geo., New York.

FIREPROOF SHUTTERS.

Kinnear Mfg. Co., The, Columbus, O.

FLOOR POLISH.

Bateher Polish Co., Boston.

GALVANIZED IRON.

American Sheet Steel Co., New York.

GATES.

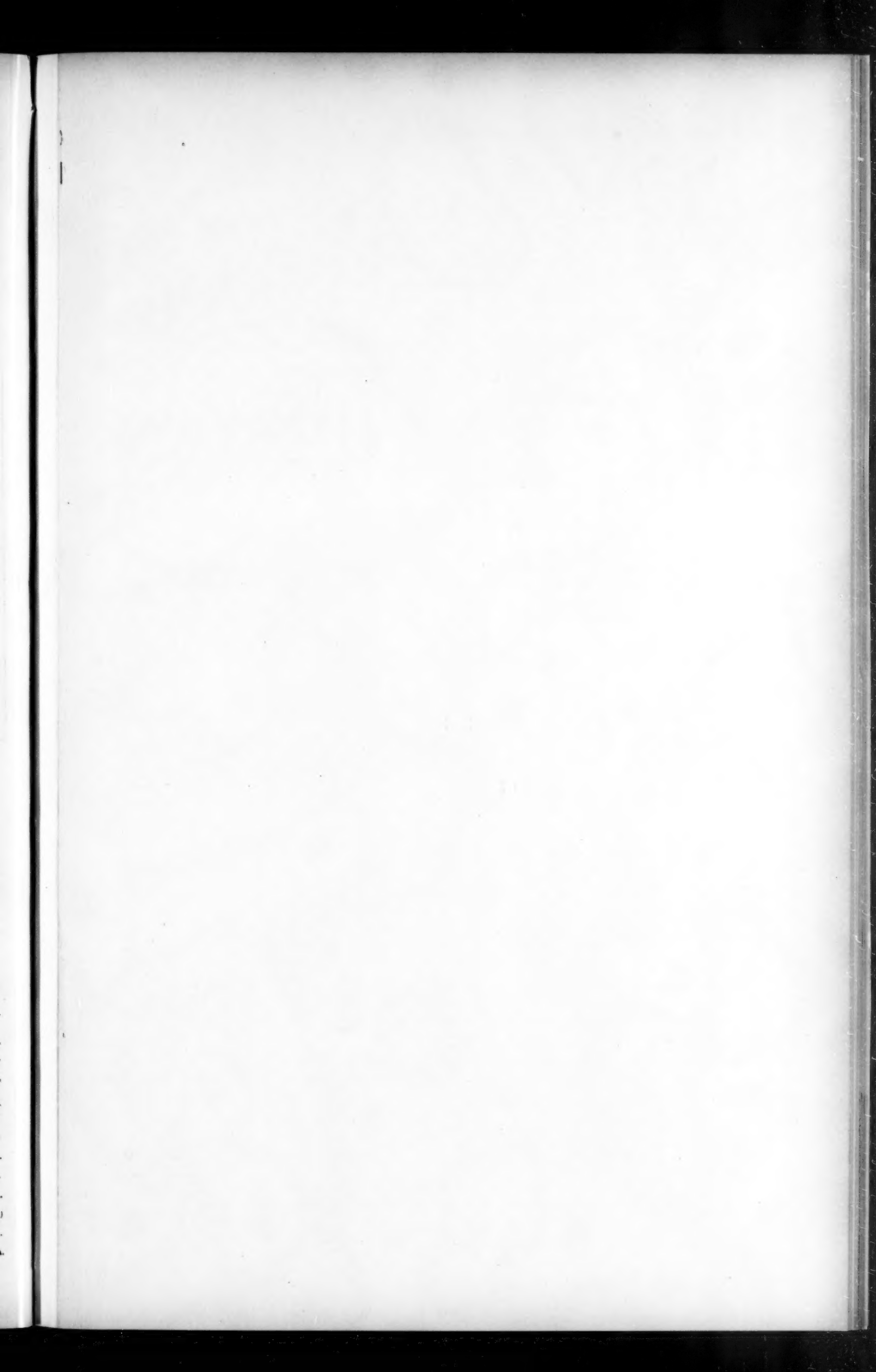
Wm. R. Pitt, New York.

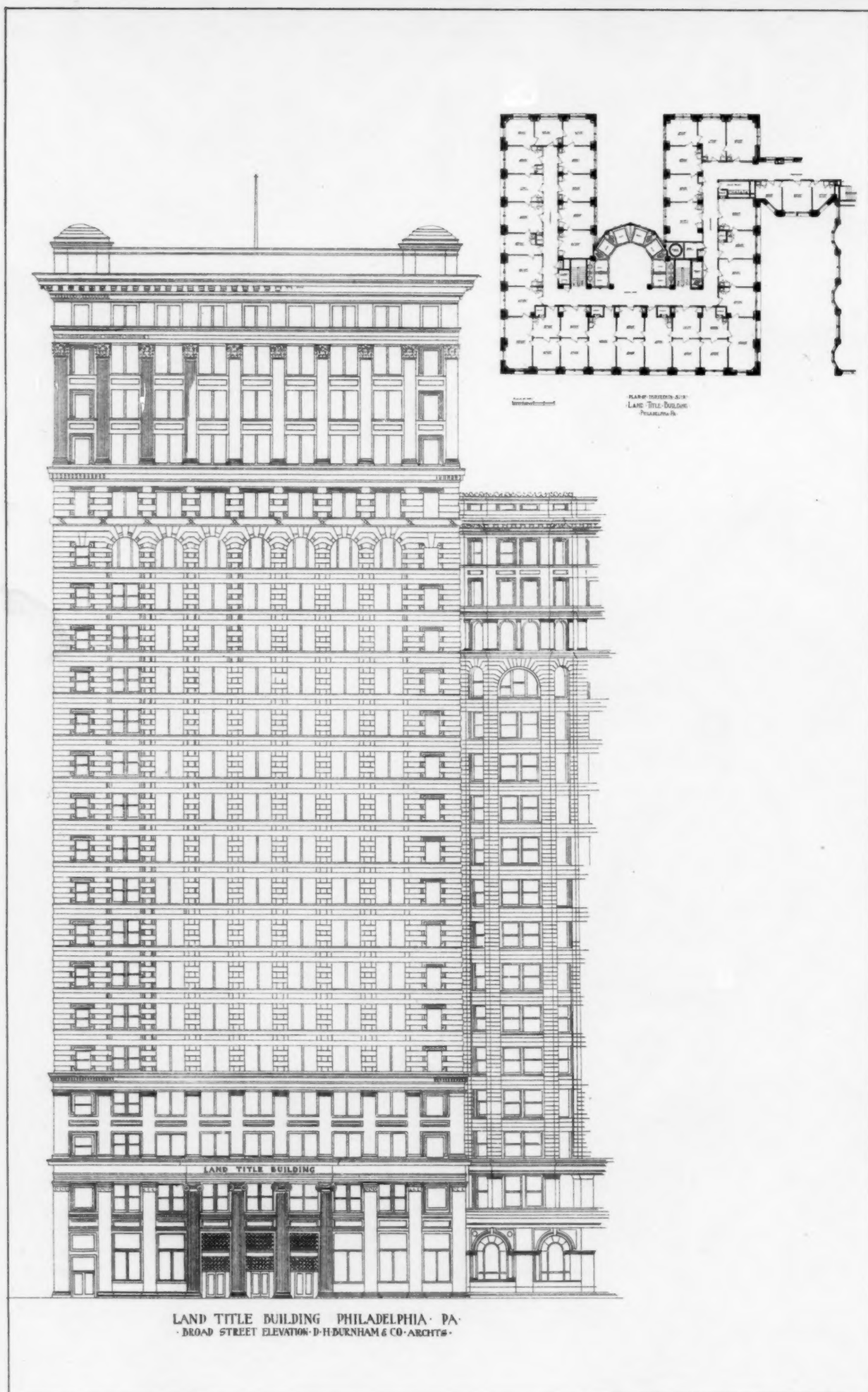
GRATES, ETC.

Wm. H. Jackson & Co., New York.

GREASE (Graphite).

Wisconsin Graphite Co., Pittsb'g, Pa.



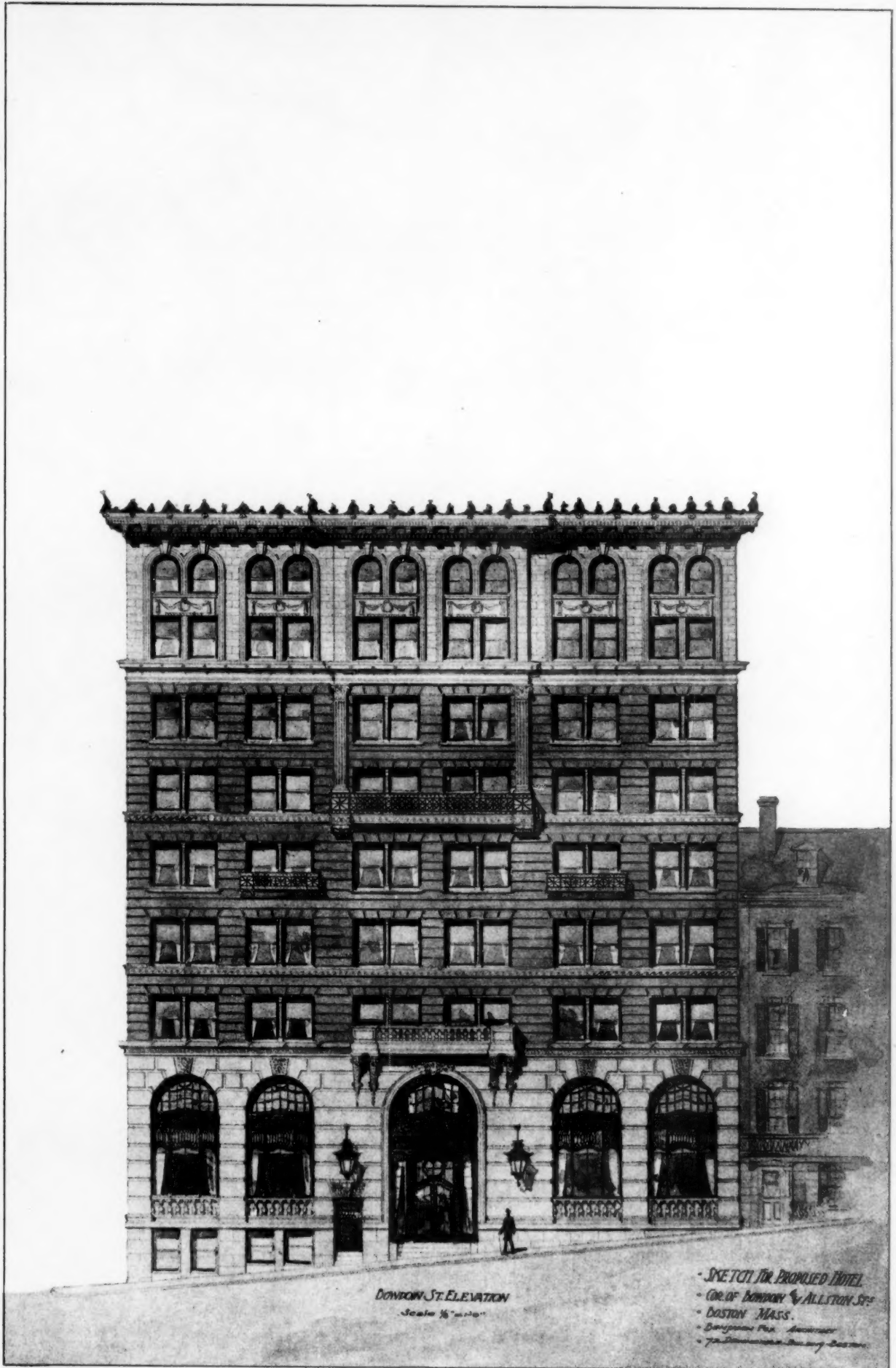


COURTESY 1964 BY THE AMERICAN ARCHITECT AND BUILDING NEWS CO.

RELIOTYPE PRINTING CO. BOSTON

LAND TITLE BUILDING.
D. H. BURNHAM & Co., ARCHITECTS.

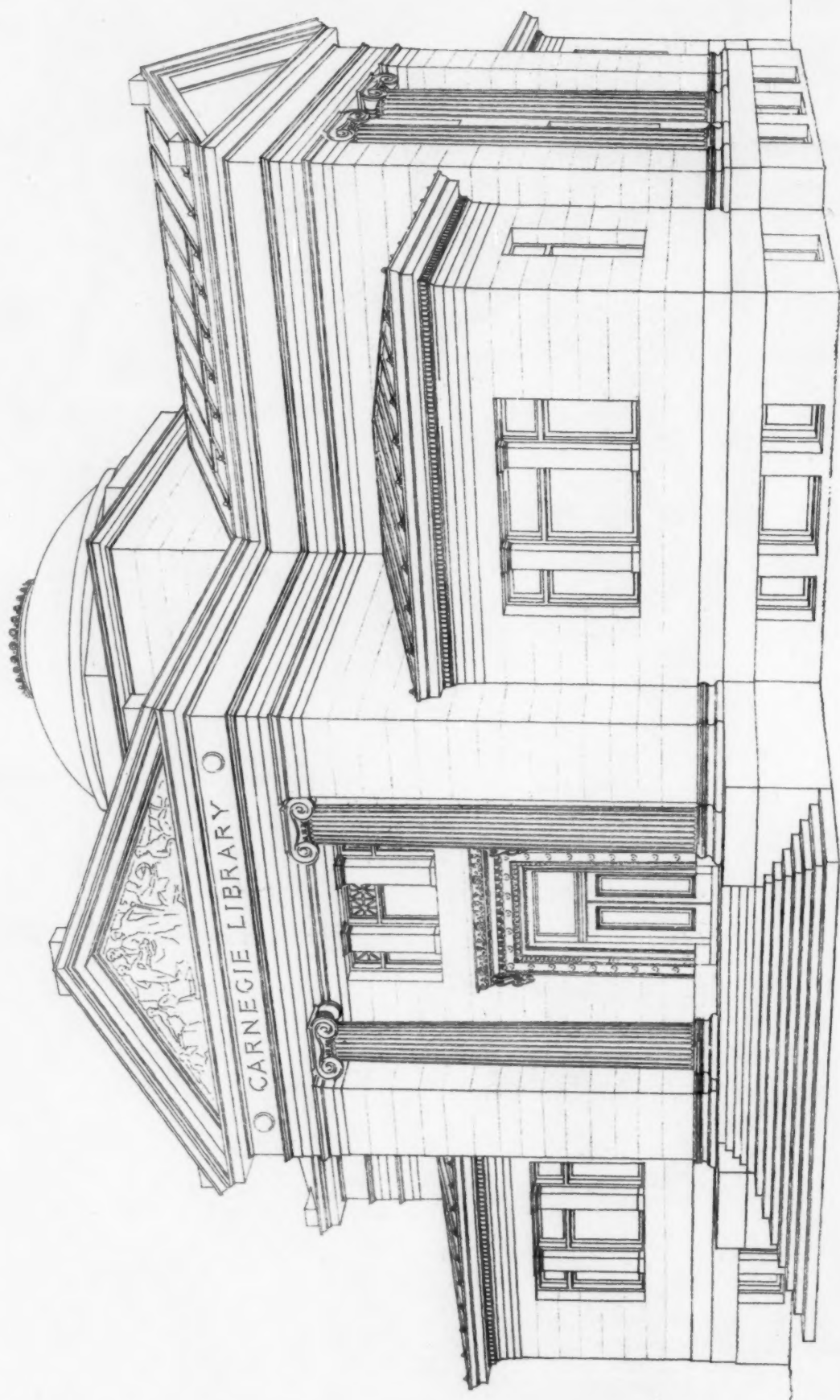
The American Architect
Sept. 27, 1902.
No. 1396.

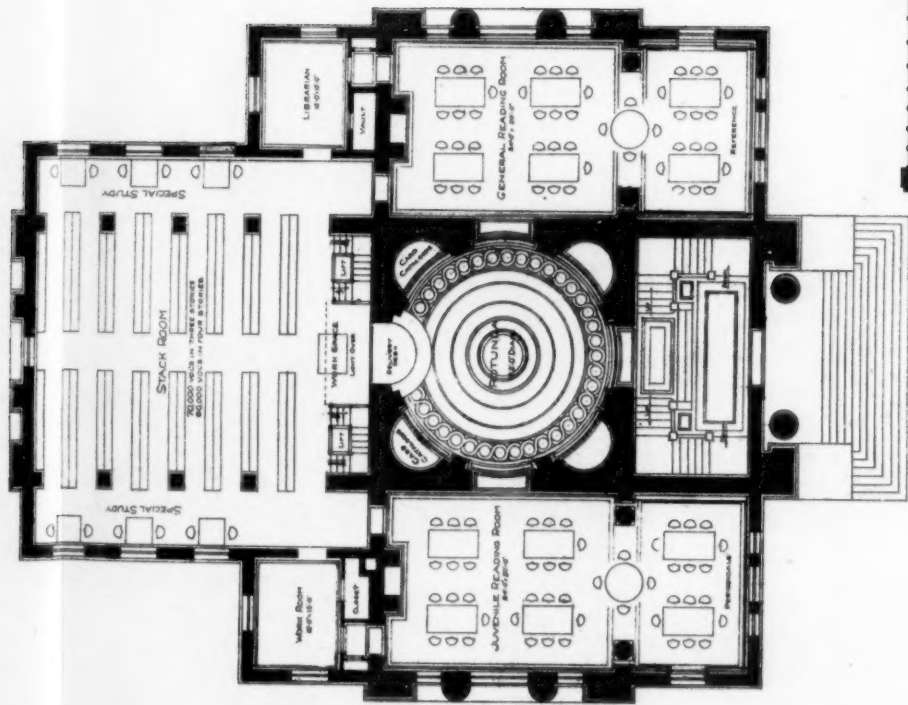


COPYRIGHT 1902 BY THE AMERICAN ARCHITECT AND BUILDING NEWS CO.

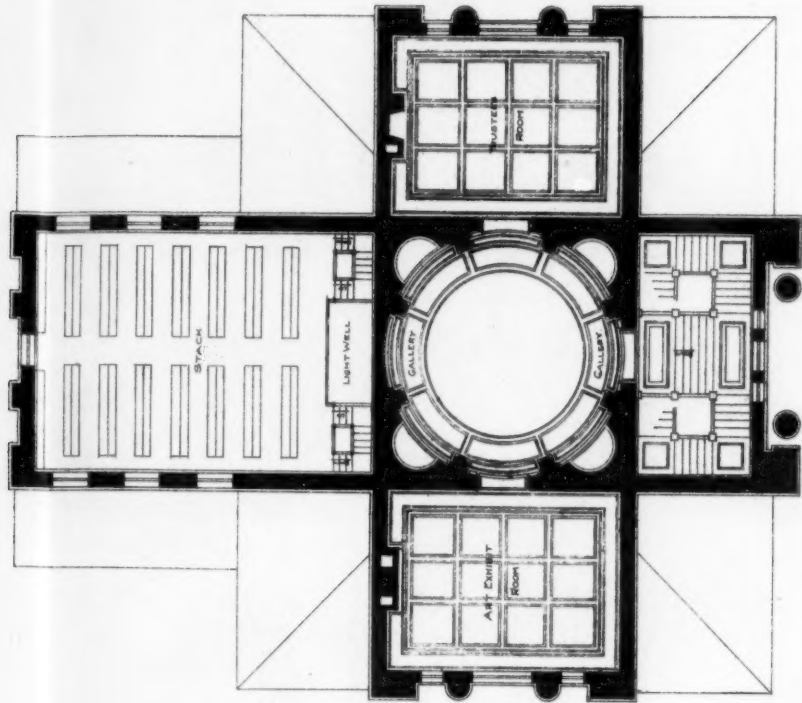
RELIEF PRINTING CO. BOSTON

The American Architect
 Sept. 27, 1902.
 No. 1396.

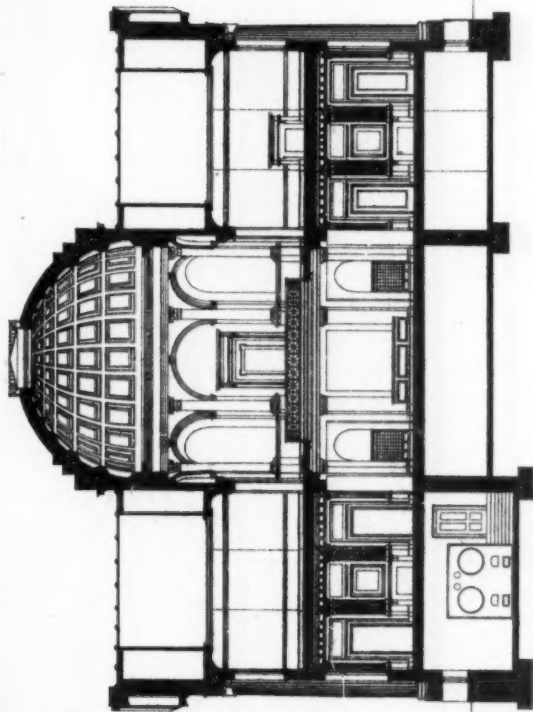




FIRST FLOOR PLAN.



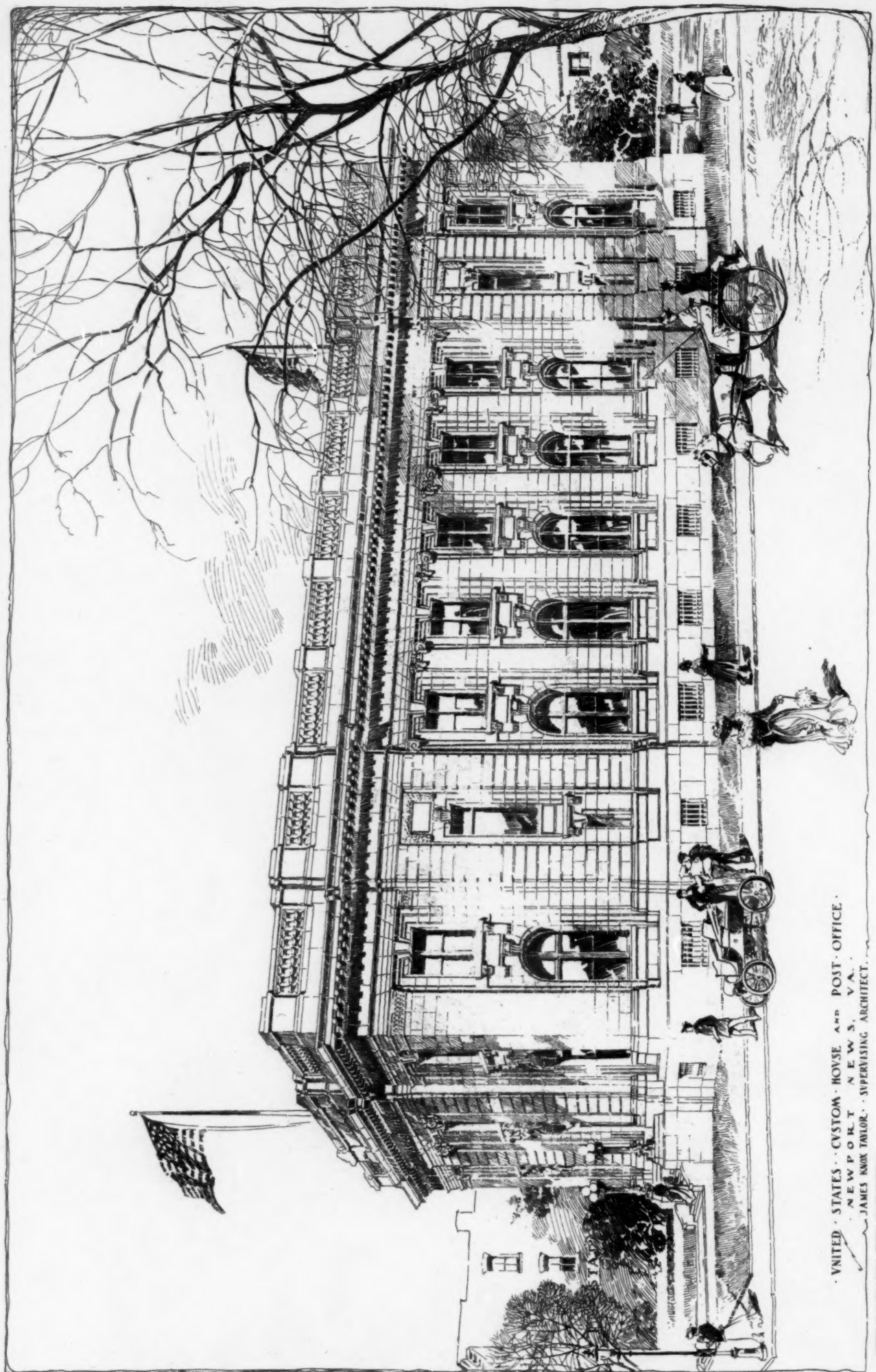
SECOND FLOOR PLAN



TRANSVERSE SECTION

A COMPETITIVE DESIGN FOR THE CARNEGIE LIBRARY, BURLINGTON VT.
WALES & HOLT, ARCHITECTS.

The American Architect
Sept. 27, 1902.

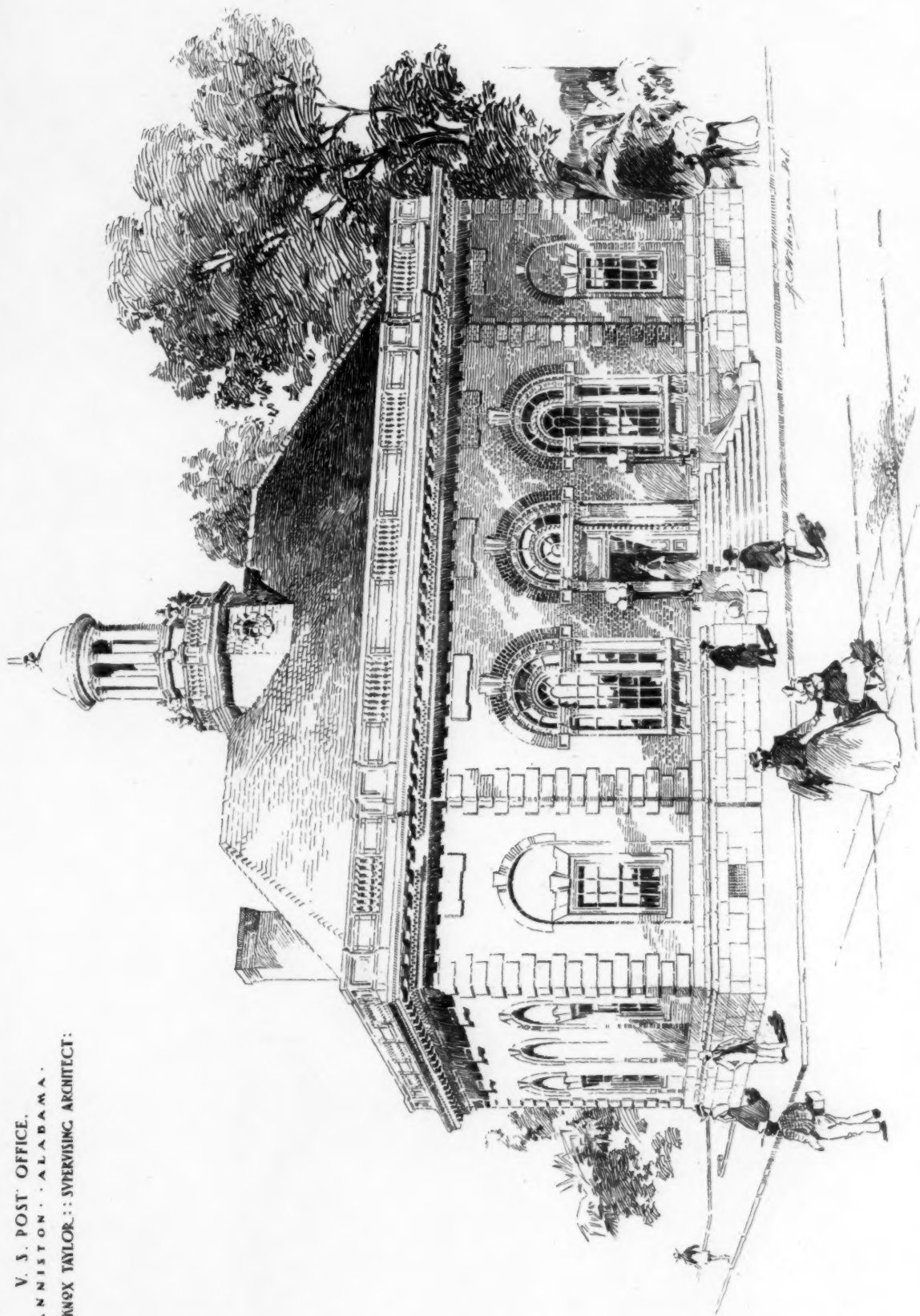


UNITED STATES CUSTOM HOUSE AND POST OFFICE
 NEWPORT, N. Y.
 JAMES KNOX TAYLOR, SUPERVISING ARCHITECT.

COPYRIGHT 1902 BY THE ARCHITECT JAMES KNOX TAYLOR

REPRODUCED BY THE ARCHITECT

V. S. POST OFFICE.
ANNISTON, ALABAMA.
JAMES KNOX TAYLOR, SUPERVISING ARCHITECT.



ENGRAVED BY THE AMERICAN ARCHITECT AND BUILDING NEWS CO.

ILLUSTRATED BY J.C. WILLIAMS