



Public Library,
WASHINGTON, D. C.
RECEIVED
OCT 5 1904

THE AMERICAN ARCHITECT AND BUILDING NEWS

Vol. LXXXII SATURDAY, OCTOBER 3, 1903 No. 1449

CONTENTS.

SUMMARY:—

A General Famine in Single Dwelling-houses.—An ingenious Example of early Fireproof building.—The Tennessee Supreme Court rules against the Union Label.—Mr. Frederick Dielman made Professor of Drawing in the College of the City of New York.—The English "Garden City" Movement.—Electric Gas-lighting in Paris.—Count Zeppelin abandons his Aeronautic Experiments. 1

SAFEGUARDS AGAINST FIRES CAUSED BY LIGHTNING. 3

THE INFLUENCE OF MOISTURE UPON CERTAIN MORTARS. 4

CALIFORNIAN REDWOOD AS A SUBSTITUTE FOR STEEL. 5

CHRIST CHURCH CATHEDRAL, OXFORD. 5

BOOKS AND PAPERS. 7

ILLUSTRATIONS:—

Bird's-eye View of the Palace of the Popes, Avignon, France.—Plan and Sectional View of the Same.—House of W. B. Thayer, Esq., Kansas City, Mo.—The Drawing-room House of A. W. Meyer, Esq., Kansas City, Mo.—House of Mrs. A. W. Armour, Kansas City, Mo.—Sketch for Psi Upsilon Chapter-house: Bowdoin College, Brunswick, Me. Additional: Rear View: House of A. W. Meyer, Kansas City, Mo.—Fireplace in the same House.—Rear Galleries: Woolsey Auditorium, Y. U., New Haven, Conn.—Side Gallery of the Same.—The Newberry Organ in the Same.—The Vestibule in the Same. 7

NOTES AND CLIPPINGS. 8

FROM all directions come complaints that single dwelling-houses of a modest class, renting at from fifteen to fifty dollars a month, are, for the first time for many years, difficult to find. In New Haven, as we are told, there is not a single dwelling-house of this kind available, where, a year or two ago, there were hundreds of them. From Wilmington, Delaware, Louisville, Kentucky, Pittsburgh, Worcester, and the metropolitan district of Boston come similar stories, and rents, which have for years been very low, have, in some places, risen materially. Of course, this condition of things presages renewed activity in house-building, and renewed employment for those concerned in building, including architects; but it is interesting to inquire into the reason of this happy change. As there has been very little building of dwelling-houses for several years, owing, mainly, to the high price of materials and labor, the natural increase of population was likely to overtake the accommodation sooner or later; but the suddenness of the change within the past year indicates, in addition to this, a certain modification of sentiment in the community in favor of single dwellings, as compared with lodgings in tenement-houses. Every one who goes much about the tenement-house and apartment-house quarters of the Eastern cities must have observed the prodigal display of "To Let" cards in the windows, and this appearance, coincident with a revival of the demand for suburban houses, points to a shifting of a considerable portion of the apartment-house population to the pleasanter and more comfortable independent dwelling. It has taken something like a decade to show the community that, in these days of electric street railways, it is just as convenient and just as cheap for a man to live in his own house in the suburbs, where the heating, lighting and other services are under his own control, and where he can keep his rooms clean and attractive, as it is to share an apartment-house with half a dozen or more tenants, the dirtiest of whom sets the standard for all the rest, by distributing his surplus dust and vermin over the whole establishment, and where, on Sunday mornings in winter, the tenants must lie in bed, to keep from freezing, until it pleases the janitor to get up and start the fire; but the lesson seems to have been learned, and the improvements in street-car transportation, which are sure to come before long, should increase the present movement.

IN tearing down a building on the corner of William Street and Exchange Place, in New York, for the purpose of erecting in the place a twenty-five story office-building, some interesting discoveries were made. The old building is known to have been erected in 1855 or 1856, and proves to have presented a most ingenious example of fireproof construction. At that time, although rolled iron I-beams had been made, they were not easily procured, and the floors were constructed with a curious substitute for them. It is hardly necessary to say that angle-irons were still less easily procured than I-beams, and the whole floor construction was made up of plates. The

main girders, thirty-five feet in span, consisted of pairs of vertical web-plates eighteen inches deep, with top and bottom flange-plates, eight inches wide. In order to connect these parts vertical stiffeners, as they would now be called, consisting of bars three inches wide, and three-quarters of an inch thick, were inserted between the web-plates and riveted through; and, to connect the stiffeners with the flange-plates, the latter were mortised, and the ends of the stiffener-bars, reduced to form a tenon, were put through the mortises, and riveted while hot, so as to bind the flange-plates closely to the web. This construction is, of course, much less reliable than one of angle-irons, or a solid rolled shape, but it answered the purpose perfectly at the time.

THE floor beams proper, ten inches deep, were also made with double web-plates and flange-plates at top and bottom, but the web-plates were only one-sixteenth of an inch thick, and were bent out by hand at top and bottom, so as to form what we should call channel-irons, and were then riveted to the flange-plates by continuous rows of rivets. The bending of the web-plates was imperfectly done, the section showing curves instead of angles; but the purpose was fulfilled; and with flat stiffener-bars inserted at short intervals, and riveted through, the construction was quite sufficient for the span required, of eight feet. The floor beams were laid on the lower flange of the girders, and in the space above corrugated plates were laid, the corrugations measuring about twelve inches from centre to centre, and filling nearly the whole depth of eight inches from the top of the girder to the top of the beam. The corrugations were angular, instead of following the curves now usual; and the prismatic troughs formed by them were filled with concrete, levelled off just above the top of the girder, so as to form a continuous concrete floor. In this concrete sleepers were laid, to which was nailed a wooden floor. Of course, to our ideas such a floor offered far too much exposed metal to the action of fire; but, even in this respect, it was superior to the "Harper beam" construction which preceded it by a very few years, and, as a piece of painstaking and ingenious practical engineering it is worthy of the highest praise. So far as can be judged from internal evidence, the designer of this floor had either seen a rolled I-beam, or understood the principles on which the latter was designed; and he used the materials and processes which were available, to produce results as nearly similar as possible, and with a remarkable appreciation of the necessary disposition of the metal. It is gratifying to learn that, after almost fifty years of use, the entire floor structure, which was simply painted with iron oxide paint, is in practically perfect condition; and except for the exigencies of modern improvement, it might, apparently, have done good service for a thousand years longer.

A DECISION of very considerable importance to architects and contractors has been given by the Supreme Court of Tennessee. The City Council of Nashville had passed an ordinance, requiring that all city printing should bear the union label of the Nashville Allied Trades Council, or the International Typographical Union. The city advertised for bids for certain printing work, specifying, in its advertisement, that the work should bear the union label. The bid of the Marshall & Bruce Company for the work, based on the advertisement, was accepted, and a contract entered into with the Company, stipulating that the work should have the union label. The Marshall & Bruce Company did the work, and delivered it to the city authorities, but without the union label. When they sent in their bill, payment was refused, on the ground that neither the contract nor the ordinance had been complied with. The Company sued, and the first court upheld the bill. The second court reversed this decision, and was in its turn overruled by the Supreme Court, which held that the ordinance was void, as being contrary to public policy, to the constitution of the State of Tennessee, and to the Fourteenth Amendment of the Constitution of the United States. The city maintained that, even if the ordinance was void, the contract with the printers, which contained the same stipulation, was binding, and that, as the contract had been violated, the bill could not be collected. The majority of the Court, however, held that

"all bidders must be assumed to have known that the provision was illegal, and could not be enforced. This being so, the contract and bidding must be treated as though no such condition was attached to them, and the complainants, having made the lowest bid, and having been awarded the contract and having executed the same in all respects according to the specifications, except the requirement as to the label, the city is legally obligated and bound to accept and pay for the goods, and complainants are entitled to recover the stipulated price."

THIS doctrine, which has, so far as we know, not been hitherto included in any Supreme Court decision, obviously has an important application in the case of contracts for public building work, in which officials with an eye to the labor vote often insert stipulations in favor of the unions. Prudent bidders usually avoid contracts with such conditions altogether, or arrange, of course at the cost of the taxpayers, for protecting themselves against trouble in connection with them; and the theory that conditions of the sort may be regarded as invalid, and entirely ignored, is likely to effect a considerable change in bidding for public contracts.

MR. FREDERICK DIELMAN, President of the National Academy of Design, and an artist very well known to architects from his decorative work in the Congressional Library and elsewhere, has been appointed Professor of Drawing and Descriptive Geometry at the College of the City of New York. Professor Dielman is peculiarly well equipped for such work, having had a long training, first as a student in Calvert College, Maryland, and, later, at the Royal Polytechnic Institution at Munich, and as draughtsman in the United States Engineers' office. He has also been a very successful teacher at the Art Students' League, the Woman's Art School at the Cooper Union, and in the schools of the National Academy of Design.

THERE is a curious flavor of the beginnings of the French Revolution in a large proportion of the schemes now current in England. The latest of these is the "Garden City" movement, reputed to be a development from the fancies of Edward Bellamy. The inspiration for the latest "Garden City" seems to have been derived from the fact that the London County Council recently paid a million dollars for "a few acres" of land in London, on which to build workmen's dwellings. The presumption is that the County Council, which is practically in the hands of socialistic and trades-union schemers, paid a great deal more for the land than it was worth; but the Garden City enthusiasts naturally pass over that view of the subject, and devote themselves to pointing out that "one-quarter" of this sum would be sufficient to purchase a tract of "six thousand acres of first-class farming land within fifty miles of London, one thousand acres of which would be ample to build ideal homes and workshops for thirty thousand souls, leaving five thousand acres of land for farms and market gardens, the city being a good market for the farmers and gardeners, and the rent from the farms being in turn a source of revenue to the city funds. At the same time, the large park spaces in the heart of the city, and the considerable expanse of field and hedgerow which will surround the city, will make it impossible for any one to live more than a few minutes from God's fresh air."

SUPPOSING it to be true, which we very much doubt, that the freehold of land which is at the same time "first-class farming land" and suitable, in elevation and natural drainage, for a city site, can be bought, anywhere within fifty miles of London, for forty dollars an acre, it does not follow that a prosperous city can be established in it. A city implies inhabitants, and inhabitants will go only where there is employment for them. If they can be sure of employment, they will, undoubtedly, prefer a place where the air and drainage are good, the houses new and convenient, the streets well kept, the taxes low, and the schools for their children well managed; but they cannot take the risk of uncertainty in any of these matters. As a suburban settlement, a city fifty miles from London would be useless, so far as workmen are concerned, for they could not afford either the time or money which would be consumed in reaching their work in London from such a distance. To attract them the new city must, therefore, have its workshops already in successful operation, and it is difficult to understand how this can be arranged. Under the scheme of organization

the "unearned increment," that is, all increase of value of land due to improvement and settlement, is taken by the community, so that manufacturers have no inducement to take up land, and profit, later, by selling it for house-lots; and people who are disposed to invest in real-estate, trusting to its natural appreciation in value to offset taxes and loss of interest, will, of course, avoid the place. No settlement has yet succeeded without the help of some selfish attraction, and it is obvious that the whole scheme depends upon getting outside capital interested in the new town. Without inhabitants in the town, there will certainly be no farmers in the encircling district; and without farmers there will be no rent for the farms, and no income to pay for building streets, sewers, gas and electric-light plants, telephone systems and the other "scientific" conveniences which the disciples of Mr. Bellamy find so attractive. It appears that one hundred thousand dollars' worth of stock has been subscribed for. What part of the subscriptions has been paid in does not appear, but, even in this country of deserted towns, wrecked socialistic communities and abandoned schemes, it is doubtful if any more colossal castle in the air was ever built on a more inadequate foundation.

THE electric gas-lighting apparatus, so familiar to us for the past twenty years, is just beginning to be introduced in Paris. In that city incandescent electric lighting costs in houses about six times as much as gaslight, for equal illumination, so that economy, which the French pursue with commendable intelligence and zeal, indicates the use of gas, wherever practicable, in place of electricity. There, however, as here, the annoyances attending the lighting of gas with matches, and the waste involved in leaving it burning in unoccupied rooms, in order to save the trouble of finding a match and lighting it later, have led to the substitution of incandescent lights, controlled by switches so that the current can be turned on or off upon entering or leaving the room. Now, a reaction is felt in Paris, as here, against the costly electric light. The Parisian merchants have quite generally abandoned electricity in favor of the improved gas-burners of the Welsbach type, which give a steady and brilliant white light at a small fraction of the cost of electric current, and the owners of dwelling-houses are disposed to follow their example. To aid them in doing so, an electric gas-lighting device, under the name of the "Telephos," has been put on the market, which seems to be very similar to our well-known automatic burners. Whether it is superior to the latter or not remains to be seen, but our manufacturers have had such a long experience with devices of the sort that it seems as if they might find a very promising field in Paris, where the disposition of the public seems favorable, and where their practical knowledge of the subject should be valuable. We have before suggested that American plumbers and American plumbing apparatus, now the best in the world, might find a profitable market just now in Paris, where many thousand houses still remain to be piped and fitted, and connected with the sewers, before the limit of time allowed by law expires; and perhaps an American house might with advantage introduce the Parisian public to the perfections of American plumbing, American gas-fitting and American electric gas-lighting, at the same time.

LE GÉNIE CIVIL, which has had the discernment to devote itself conspicuously to recording the progress of the new art of navigating the air, tells us that General Count Zeppelin, whose experiments on the shore of the Lake of Constance with a navigable balloon excited much attention a year or two ago, has abandoned his enterprise, after expending half of his fortune, and an equal amount contributed by his friends. The Zeppelin balloon was a very expensive construction, partly of aluminum, and, although it made several successful voyages over the lake, its great length exposed it to dangerous distortion under certain conditions, and after spending so much money on the first one, the distinguished inventor did not feel warranted in devoting a large additional sum to building a second. It is a little singular that he should not have had Government aid. As a military man, quick to see what use could be made of aërostats in war, he had a peculiar claim to official support, and, in view of the fact that the whole modern science of aëronautics is, practically, based upon the experiments made, under favor of the military authority, by two young French officers a few years ago, it must be peculiarly trying to Count Zeppelin to be obliged to quit the field in which he had already won an honorable name.

SAFEGUARDS AGAINST FIRES CAUSED BY LIGHTNING.¹

THE number of buildings damaged by lightning in England varies slightly from one year to another, but is so far constant that it is perfectly safe to say that in the course of any ten years between 3,000 and 4,000 suffer from this cause, of which about 200 are churches.

Statistics that have been published show that thunderstorms are gradually increasing over the whole of civilized Europe. Thus in the course of sixty years the average number of such storms in London has increased from twelve to twenty-two per annum. Considering the number of lightning discharges in these storms, it appears evident that damage would be very much more frequent if it were not for the number of lightning conductors in use. Conductors, however, are not always successful. They sometimes fail when they appear to have been applied in accordance with the better known rules supposed to govern the subject. On the other hand, cases occur in which conductors that would be condemned as inefficient under those same rules answer perfectly when struck by lightning. This anomalous state of affairs shows that there is some important factor that is very frequently overlooked, and which must be the crux of the question.

I propose placing before you certain aspects of the matter which will demonstrate what I consider to be this overlooked factor, and which must be accorded their proper significance if efficient protection is to be secured.

Probably one of the causes that interfere with a clear conception of the methods necessary for protection is the view that is often taken as to what a discharge of lightning is. Although the idea of a thunderbolt accompanying a lightning flash is known by scientists, and probably by the majority of the public, to be illusory, there is still a tendency to regard lightning as something which leaves a cloud and damages a building or other object by striking it. The language used in connection with the subject unfortunately fosters this idea. Even the term "struck by lightning" is, I consider, scarcely correct, though for want of a better I shall have to use it frequently in the course of this paper.

At the best lightning is too often regarded as an electric current overcoming the resistance of the air, but this resistance has nothing in common with that which is the subject of Ohm's law, and to consider it merely as a momentary current is apt, I think, to give a somewhat misleading view of the matter. I want you, in the course of my remarks, to regard it as a breakdown of the dielectric — not as something leaving the sky to come to earth, or as being hurled from the clouds to strike a building, but to consider it — as it indeed is — as a fracture or cracking, both of the air and of any other resisting medium between the oppositely charged bodies, the clouds and the earth. As a mechanical analogue, one may liken the air under these conditions to a thick slab of glass, or other strong material, subjected to an enormous pressure from above and below, and which will crack when the pressure is greater than the material will bear: a building may be considered as a weaker object firmly embedded in the glass. We may, in fact, regard ourselves as living between the inner and outer coatings of an enormous Leyden jar or other condenser.

Now when the stress to which the air is subjected has reached the breaking point, which is about half a gramme weight per square centimetre, the line of the fracture becomes visible by the intense heat making the air particles momentarily incandescent, and this we call "lightning." The building which, being in the line of the strain, gets damaged, forms only a part of the fracture; the air is equally damaged, but is a self-repairing medium. Unfortunately, our buildings, trees and bodies, which are less resisting than the air, are not self-repairing, and so we get the deplorable losses of life and property that occur every year.

Let me say here that, even allowing for the effects of induction, lightning can no more be said to be attracted by a conductor than a crack across a sheet of glass can be said to be attracted by any weak part which would cause it to take other than a straight course, or than a brook winding through a meadow can be said to have been attracted by the softer ground through which it has carved its way. At the top the conductor would be provided with a point, or several points, so as to prevent the discharge occurring if possible, and, if not, to try and render it less violent. As regards the lower part, if it ended at the ground line the conductor would answer, provided there had been rain and the surface of the ground was wet, but if the flash occurred in dry weather there would be resistance to overcome between the conductor and the conducting stratum below causing heat, and the least that would happen would be that the ground at this point would be blown up. This might be considered not worth the expense of making a good earth connection to prevent, but one cannot be certain that this would be the only effect. The explosive force in such a case is often equal to that of some pounds of gunpowder, and so there is danger of damage to the brickwork or foundations. A fairly good earth connection is therefore advisable, but it need not be a "perfect earth"; so long as the resistance is fairly low and the conductor is of such a size as not to be fused, we can feel confident that it will answer in this case.

It must not be supposed that I am stating that a good "earth" is never necessary; in very many cases it most certainly is. What I

wish to imply is that a good "earth" is a matter of comparison. One cannot fix a limit of so many ohms and say beyond that a conductor "earth" is inefficient, for under certain conditions a conductor would not fail with an "earth" resistance of 100 ohms, or even hundreds of ohms, while under others two or three ohms would be too much. A discharge would not leave a conductor, even if there was a fairly high resistance, to go to earth by another route unless there was a rival one open to it. By a good "earth" I mean one that has a low resistance in comparison with any other possible "earth" in its neighborhood.

Now, suppose that instead of the structure being composed of a solid mass of bricks or stone it was made hollow, with a stone staircase in the interior and a gas-pipe carried up to afford light at intervals, the conditions would be entirely changed. There would then be a rival conductor in the interior with a perfect earth connection; for gas-pipes, owing to the extent of the surface of the mains underground, have merely nominal "earth" resistances, and if the conductor had a higher one the discharge would either be entirely diverted to the gas-pipe or be divided between the conductor proper on the exterior and the accidental one in the interior, according as the resistance of the former was great or small. It is not practicable to make the "earth" of the intended conductor appreciably lower than the gas main, but if we succeeded in getting it so to a fractional extent there would still be the dangerous rival inside, and there would be a side flash, or let us say a side fracture, between the two conductors if the brickwork or air between, as the case might be, was not sufficiently strong to resist the stress suddenly thrown upon it. It would be necessary, then, besides having a perfect "earth," to place the conductor so that there should be a sufficiently strong buffer of resisting material between the two as to make it impossible for the discharge to break through. I do not mean by this the use of glass insulators or keeping the conductor a few inches away from the wall, but by a considerable space of resisting material.

We have to look the fact squarely in the face that side flash, or sparking, will occur between a struck conductor and other metals sufficiently near it. A perfect "earth" does not prevent side flash, it only reduces the sparking distance; a comparatively bad "earth" increases it. We must therefore see that the other metals are at a safe distance, or make connections across to act as a conductor for the spark. I have reasons for fixing the safe distance between two perfectly "earthed" conductors, in the most extreme cases, as 5 feet for ordinary building materials, while in some cases, depending on the course of the accidental conductor, it is considerably less.

We have been considering in these discussions the most simple cases one could have to deal with. If all buildings were like these a school-boy might, with half an hour's instruction or by means of a few set rules, learn to protect them perfectly. Unfortunately metals are introduced very largely into the construction of modern buildings. You will see metal cowl on chimneys, lead flashing round chimney-bases, rain-water pipes and gutters, fire-grates, girders, gas and water supply pipes, etc., forming a most complicated problem. Is it any cause for wonder when lightning-conductors are put up, as they generally are, absolutely regardless of these accidental conductors, that cases of failure occur? I consider that to put a single conductor on such a building, expecting it to attract lightning and carry it away, would be like putting a pipe under two or three of the holes in the bottom of a tin colander, and expecting the pipe to attract the water to the holes directly over it, ignoring all the other holes.

I have found that on an average about a dozen cases of failure of conductors occur in this country every year. The only wonder to my mind is that there are not more.

Cases of failure may be divided into five main classes or headings.

1. Where the conductor is not touched, the discharge taking an entirely different course. Such cases are not very interesting, and ought scarcely to be called failures of conductors — they are merely failures of the sanguine expectations of those who put them up.

2. Cases in which the conductor is struck and damage occurs owing to non-compliance with the more elementary rules appertaining to the subject. Such cases are not very serious as a rule. The ground may be blown up owing to a very high resistance; the conductor may be broken or fused at a bad joint; or it may be torn loose owing to a bad bend.

3. Cases where a part or the whole of the discharge leaves the conductor and takes another course through accidental conductors to earth. Such cases are primarily due to there being alternative paths available for the discharge, and they often result in very serious damage. If inflammable materials happen to lie in the path the risk of destruction of the building by fire is very great. The most dangerous form of alternative path is a gas-pipe, and soft metal pipes are especially so.

4. Where sparks occur between lightning conductors and neighboring metals not leading to earth. These cases do not usually result in very serious damage, unless fire is caused by something inflammable in the line of the spark.

5. Where there is no side flash from the conductor, but sparks occur between two metals distinct from the conductor. These cases are very interesting, but fortunately are not very common. They are apt to cause fires, in fact, it is often the setting of the building on fire that shows such an effect has occurred.

The view that is often taken of a lightning conductor appears to be erroneous in one respect. It is regarded as a piece of apparatus intended for a certain purpose, and which should, therefore, perform its allotted function. Consequently too much thought is directed to

¹Extracts from a paper by Alfred Hands, prepared for the International Fire Congress.

trivial details, such as the particular form of conductor, its fastenings and accessories, and too little is extended to the fact that the question of its efficiency or non-efficiency depends on the way in which it is applied rather than on the conductor itself. A piece of apparatus might be depended upon, if a good one, to work in any place. A telephone, for instance, might answer equally well whether placed in one room or in another, but a lightning conductor is entirely different, because placed in one position it might be perfectly efficient, while the same conductor if placed in another position would fail owing to the different conditions existing in its neighborhood.

With due apologies to the medical professions for the comparison, I venture to say that a conductor is more nearly comparable to the drugs that a physician prescribes, as and when he considers advisable, than to a piece of apparatus turned out of a workshop, and only requiring putting together in accordance with a few set rules to produce certain results under any and every conceivable condition. For what is a lightning conductor after all? Merely a thread of metal among the many other threads of metal in a building. It is put up especially to afford a path for lightning because for various reasons it may not be advisable to use the other threads for the purpose. But if it is not properly applied it is no longer a safeguard; the other threads become unintended lightning conductors and, in sharing the discharge among them, damage may result—not the least serious of which would be the setting of the premises on fire.

There is a tendency to regard protection from lightning too much as being the mere putting up of lightning conductors. A century ago, when buildings were differently constructed, this was, no doubt, all that was necessary in most cases; but in these days, when metals are so largely introduced into their construction, the conditions are altogether changed, and some most difficult problems are often presented even by what might at first glance be regarded as simple constructions. True protection from lightning often consists of a good deal more than the mere erection of conductors. The part that often makes the difference between efficiency and non-efficiency is the making of various connections to bridge over what I call sparking gaps, as well as keeping a safe distance away from metals that it would be dangerous to connect to.

It is difficult to set any rule as to the places where connections have to be made. They can only be judged by consideration of the conditions that would exist at the moment of discharge. I may however say that they would be the places where there would be great differences of potential. A spark is, of course, the outward and visible sign of a difference of potential. If this difference is not sufficiently great for the spark to bridge the gap between the two metals no effect will occur.

It is said that side flash is due to self-induction. Now, I attach very little importance to this. It exists, of course; a conductor cannot take a sudden discharge like a flash of lightning without there being enormous self-induction, but for this very reason it may, for practical purposes, be disregarded. As it cannot be entirely done away with, it is difficult to say what would be the practical effect of a lightning conductor absolutely without self-induction.

Experiment shows that by increasing the self-induction one increases the sparking distance, and conversely, that by reducing it one reduces the length of spark. Now, the way to reduce the self-induction in a lightning conductor to a minimum would be to give it a number of sharp bends, that is, to run it backwards and forwards across the face of a building instead of direct down to earth, but I do not suppose that any one would seriously recommend such a method of procedure as conducive to efficiency. Then, again, looking at the matter from a practical point-of-view, if you were to erect a lightning conductor in the centre of a field, with absolutely no other metals near it, you would still have self-induction, but there would be no side flash. Self-induction with no other metal near is of no moment; self-induction with other metals near is; therefore I consider that the point of practical interest centres in the "other metal," and not in self-induction.

I have already referred to the cases in which sparks occur between two metals quite distinct from the conductor. Such effects are, I think, far more common than might be supposed, and many mysterious fires, many so-called extraordinary freaks of lightning, may be explained by them. In considering a subject like this, one has to form a sort of mental picture. In a way one may liken the electric potential of the earth, or rather the part of it under consideration, to the water-level of a lake or sea. It may be higher at one time than another, but any deviation from that level, whatever it happens to be at the time, implies an unnatural state, and therefore, there will be a tendency for any displaced portion to return to the general level.

Now consider the effect at the moment that a discharge of lightning takes place. There is an enormous difference in potential at one place. One may liken it almost to a water-spout forming on a lake and then suddenly collapsing. The effect in that case will not end just at that one spot; there would be disturbance and waves propagated along the water. So I think at the moment of a lightning discharge the effect cannot begin and end just at the one spot struck; there must be waves of potential, if I may use the term, set in motion, and the effect would be visible as a spark at places where one metal approached another, provided they happened to be set in just the right manner. These effects are not very serious as a rule, but they may cause fires if the conditions are suitable, and they therefore require guarding against by connections at the critical points. Looked at from the point-of-view I have, indifferently, tried

to place before you, not only do many of the so-called vagaries of lightning become intelligible, but one can, I think, see where these peculiar effects would occur, and take means to guard against them.

It may be asked, Is there no way in which protection can be secured without the tedium of mastering the subject, or of having to depend on an expert? Yes, there is one way; but I do not think that it is one that will become general. It is to adopt what is called metal screening. If you were to cover a building completely with metal from the top of the chimneys down to the ground line, making earth connections on each side, you would have a sort of metal cage, inside which no electrical effects would occur. You might have metal ramifications of all kinds, but there would be no sparks within the structure. It would not even be necessary to have the structure entirely covered with metal. One might run a large number of wires over it, both vertically and horizontally, so as to make a metal cage, and obtain the same effect, provided that no metal was allowed to pass into the building from the outside without being connected to the cage; but the meshes formed by the wires would require to be comparatively small. It would not be sufficient to run just a few conductors over it, and so get a sort of skeleton cage. There is a case on record which shows that this does not afford metal screening.

For very dangerous places, such as explosives magazines and factories, metal screening is generally the best, and often the only safe course to adopt; but for other buildings I think the enormous expense and unsightly appearance of the cage system of protection would render it impossible of general adoption. It may, however, be adopted partly in places where there is some dangerous alternative path which it is found impossible to keep the conductor sufficiently far from. Such a case would be represented by a flèche with clock-faces illuminated by gas-lights. If the flèche was lead-covered it would already form a metal screen, and a very little addition would make it perfect; but if not, small-sized conductors should be spread over it to form a cage.

For general purposes, however, the system to be adopted is an intelligent consideration of the conditions that may exist in the structure to be protected. Knowing the conditions and their effect, connections must be made between the lightning conductor and any metals so near to it that they would constitute weak spots where side flash would occur, and even between those metals and others, or between two independent metals, if they were so placed as to cause sparking.

Conductors must be kept sufficiently far away from other metals that it would be dangerous to connect to, such as gas pipes; in other words a sufficient distance of resisting space must be maintained. I would particularly say beware of alternative paths; they are the cause of the greatest amount of damage in failures of conductors.

In arranging a conductor system it must be borne in mind that there are certain parts of a building that are exposed to be struck, and therefore the system must comprise lines of conduction from all those parts. To protect one and leave another exposed is waste of money.

Earth connections are important, and it is necessary to get the lowest resistance of any possible "earths." For this purpose a large extent of metal surface underground is a necessity. This may be obtained by means of earth-plates, or connections to gas and water mains, or by both, but in making these connections caution is necessary. Complications sometimes occur that would render them disastrous. Earth-plates should be proportionate to the moisture in the soil, never less than 3 feet square, or equivalent area, in a wet situation, while in dryer ones the plates must be increased in area proportionately. Within certain limits it may be said that doubling the area of surface contact reduces the resistance by half. Thickness of the earth-plates makes practically no difference in this respect. In somewhat dry soils resistance may be reduced by bedding the earth-plates in coke, but coke should not be used unless it is absolutely necessary.

As regards the best kind of conductor to use I consider that, taking into consideration durability and cheapness, copper is the most suitable metal, and as regards form, copper tape, band or ribbon, as it is indiscriminately called, is the best for similar reasons. Copper rope answers sufficiently well for a time, but it is not so lasting as tape.

In conclusion, I may say, do not make the conductor system unnecessarily prominent. Buildings can be efficiently protected without disfiguring them with over-obtrusive lightning conductors.

THE INFLUENCE OF MOISTURE UPON CERTAIN MORTARS.

IT is a well-known fact that a relatively small amount of sulphate of lime has an injurious effect upon the hardening of a mortar made from cement, and which, as in the case of hydraulic work, is continually under the influence of moisture. The various other sulphurous compounds produce like effects when in the presence of lime set free by the phenomenon of hardening. This influence is plainly shown by the more or less rapid expansion of the mortar, an expansion which may be continued up to the complete disintegration of the mortar. M. Candlot, in some recent experiments, obtained several double combinations of aluminate of lime and hydrated sulphate of lime by means of a mixture of tricalcium aluminate and gypsum. These combinations invariably took the form of spherulitic crystalline

groups, which, when separated from the primary liquid, presented the following composition: Alumina, 6.24 per cent; lime, 18.50 per cent; sulphuric acid, 11.70 per cent; water, 62.07 per cent, corresponding to a combination of salts with 58 molecules of water of crystallization. The salt was found to lose the greater part of its water at a temperature slightly below 212° F., and to be completely dehydrated at 572° F. It is insoluble in limewater, but is decomposed in ordinary water when the lime contained in the water is below 2 per 1,000. M. Candlot explains the expansion of a cement containing a high proportion of gypsum by the formation of the above rather complex salt in the mortar during the operation of setting, and further demonstrates this by the following examples: The Roman cements are, as is well known, very rich in alumina. They are burned at a comparatively low temperature, and the aluminates of lime to which these cements owe their rapidity of setting hydrate very easily. During this hydration sulphate of lime is formed, and this sulphate is again dissolved by the mixing of tempering water. If there be sufficient gypsum in the cement to produce a like combination before setting, the mortar will harden in a normal manner, but become expansive immediately after hardening, however low may be the quantity of gypsum which remains free. In order to demonstrate this action by proper test, M. Candlot prepared a cement mortar, with a cement to which had been added 7 per cent of gypsum. This mortar, after an immersion in sea-water for over twelve months, was found to have hardened in a perfectly normal manner. The same cement, after an addition of 20 per cent of fat lime and only 3 per cent of gypsum, produced a mortar which was strongly expansive under the action of sea-water. On the other hand, cements which contain a low proportion of alumina may be enriched without any inconvenience by the addition of large quantities of gypsum. Thus a cement which upon analysis was found to contain only 0.5 per cent of alumina, received an addition of 10 per cent of gypsum, and remained in perfect condition when immersed in sea-water; whereas the same cement, mixed with 20 per cent of Roman cement and only 2 per cent of gypsum, began to swell within a few days after its immersion. The explanation of this phenomenon is that a cement which is relatively poor in alumina contains sufficient free lime to nullify the effects produced by the hydration of the aluminate of lime contained in the Roman cements. The setting of a mortar is due to the pressure of silicate of lime, and consequently the formation of the hydrated aluminate of lime in the mortar causes expansion on account of the latter salt, being in a free state, uniting with a free sulphate of lime.* The experiments show the amount of care which ought to be taken in the matter of adding gypsum to cements, especially the Roman and Portland cements, when it is desired to obtain a mortar which will remain invariable in volume under the action of water. The formation of the double salt which causes this expansion after the setting of the mortar is essentially favored by the rapid setting free of the hydrate of lime in the mortar, which retards the chemical action of the water upon the aluminate of lime. The question now to be considered is, how can one recognize, in a simple and yet reliable manner, that a cement contains injurious quantities of gypsum? Leaving out the ordinary laboratory processes of qualitative and quantitative analysis, which require special appliances, and are therefore not within the reach of every one, there is really no simple method excepting that of the immersion of test briquettes in cold water and the careful examination of the same during varying periods of time. Even in this there is a certain amount of difficulty and inconvenience, since the influence of the gypsum does not make itself felt even upon a cement containing a comparatively low quantity of sulphate of lime until some considerable time after immersion. Thus, when the water test upon a pure cement has not produced any signs of expansion at the end of twenty-eight days, it must not be taken for granted that the cement does not contain a harmful quantity of deleterious matter, for the length of time taken for the expansion to become apparent varies according to the quantity of gypsum contained, and capillary fissures may have been forming even though the dimensions of the briquette have not varied. Finally, if one considers how cements of different origin may be chemically combined, and that the products even of the same works can be differentiated by the amount of alumina contained, by the manner in which the combinations are affected, and by the proportion of free lime, it is easy to see that the same quantity of gypsum will not always produce the same effects, and sometimes will act quite differently in what is apparently the same combination. In the matter of a quick, reliable and at the same time simple test for matter capable of disturbing the normal hardening of a cement mortar, M. J. Gresly, chemist to the Liesberg Lime & Cement Company, in the course of certain experiments, has worked out a method which apparently fulfils all the conditions, and in which is shown by artificial acceleration the presence of any materials capable of causing dangerous expansion; as, for instance, the double salt, the hydrated sulfo-aluminate of lime, and permits at the same time the necessary observation of the physical and mechanical effects produced upon the test briquettes. Several briquettes were made from a cement containing naturally 1½ per cent of gypsum, and to these raw gypsum, in proportions varying from 2 to 18 per cent, was added. A briquette of each sort was immersed in cold water immediately after the setting was completed, that is, at the end of twenty-four hours; and two others of each sort, one after having been thoroughly dried in an oven, and the other after having been subjected to the action of steam, were also immersed. The

observation of these briquettes showed that for the simple immersion and steam tests there was no sign at the end of fourteen days of any expansion in cement mortars containing as much as 10 per cent of gypsum, whereas the briquettes which had been subjected to the drying process, and which contained as little as 6 per cent gypsum, showed at the end of five days small interlacing fissures on the under face. On the seventh day small concentric cracks appeared, and on the tenth day the edges began to crumble away. The conclusions made from this test were that the greater the proportion of gypsum, the greater the expansion in artificially dried briquettes, whereas those without gypsum, or with a later addition of 2 per cent, remained quite normal, and even after an immersion of nine months showed no signs of expansion. — *Stone Trades Journal*.

CALIFORNIAN REDWOOD AS A SUBSTITUTE FOR STEEL.

THE Foreign Office has issued a report from the Consul-General at San Francisco, in which he states that a new demand has sprung up for redwood, a material which California alone can supply. It has been discovered by the chief engineer of the Niagara Falls Power Company that, under certain conditions which rule in connection with that industry, the hardest steel is inferior in resisting-power to California redwood. The Company sent an agent here to obtain figures for furnishing several million feet of the local lumber for one of the great tunnels at Niagara Falls. It appears that the engineer-in-chief of the Niagara Falls Power Company had recommended that redwood should be employed instead of steel for a great tunnel to be constructed this summer. The reason given for the preference for the California wood was that when water passed over it continuously there formed a surface of soapy and pasty nature which was proof against corrosion, whereas in the case of steel the particles of sand and matter carried with great velocity from the Niagara River cut into and destroyed the steel in an incredibly short space of time. The Redwood Association was asked if it could furnish 3,000,000 feet of redwood, for delivery in Buffalo in July next, and gave an affirmative reply. The redwood lumber to be supplied for the Niagara power tunnel is to be 3' x 8', and to be set on the narrow end, the length to be from 12 feet to 20 feet. Redwood has been found exceedingly useful in the construction of the big pipes used for the conveyance of water to many of the electric-power houses in the northern part of the State. These pipes are built up and banded. They cost less than metal pipes, are more durable, and are more easily carried around the sharp curves followed by these great water-lines. It will outlive all other woods when kept constantly moist. While it is not non-combustible, which quality some enthusiasts have erroneously ascribed to it, it burns much more slowly than any other kind of timber used for building purposes, as it contains no inflammable oil or resin. While it is not desirable to be used as a fire-wall, the resistance it offers to the inroads of fire has been the salvation of many dwellings constructed with it. The discarded stumps of redwood felled for their lumber many years since have come into favor for the manufacture of furniture and the interior decorations of buildings, the curled grain making beautiful figures, and the wood itself taking a fine polish. Just at present Californian redwood is in great demand in the Eastern States of America. — *Building News*.

CHRIST CHURCH CATHEDRAL, OXFORD.¹

THE history of the Cathedral dates back to the eighth century, when a prince named Didan who lived at Oxford had, by his wife Safrid, a daughter called Frideswyde. Her father built her a church within the city of Oxford which he dedicated to the honor of the Holy Trinity, the Virgin Mary and All Saints. He also "erected the other edifices adjoining to the church," and settled lands upon the Nunnery. Frideswyde, who was a woman of great piety, took the veil, induced "twelve virgins of noble extract to follow her," and here she lived doing good work and performing many miracles. Some time after the death of Frideswyde the nuns were removed, the buildings being occupied and the work carried on by a body of Secular Canons. At the massacre of the Danes by the West Saxons, which King Ethelred II had commanded to take place on St. Brice's Day, 1002, those living about Oxford sought refuge in the tower of St. Frideswyde's Church. After some resistance they were burned in the tower, and at the same time the roof and other portions of the church were destroyed. In 1004 Ethelred commenced the restoration of the building, and of his work a great deal may now be traced. Prior to the Norman Conquest the Seculars were suppressed and the Priory granted to the Benedictine Monastery of Abingdon, subsequently to Roger, Bishop of Salisbury, and finally it was restored in the reign of Henry I to the Canons Regular of St. Augustine. During this time the buildings became in a very ruined condition. The first Prior was Guimond (1120-41), and probably he restored the roofs and some of the other dilapidations. Sir G. G. Scott ascribes the Norman doorway of the Chapter House to him. During Guimond's time a school was founded in connection with the priory, the buildings occupying a position in about the centre of the present great quadrangle. Inns and halls were subsequently acquired, notably Vine Hall and Peckwater

¹ Extract from a paper read by Mr. Frank E. Spiers before the members of the Upper Norwood Athenæum.

Inn, that now form part of the college buildings. Robert of Cricklade, the next prior (1141-80), completed the restoration, the later Norman work, including the presbytery and clerestory, being probably some of his work. He had the relics of St. Frideswyde translated "from an obscure place on the north side of the choir." They were again translated in 1289 by Robert de Ewelme, then prior, the beautiful marble tomb now in the Lady Chapel being made for the purpose. At the Reformation (1538) this was demolished, but portions were recovered from various places and set up in their present position. The upper part, which was of wood, is utterly lost. The priory was suppressed by Wolsey in 1524, who obtained a Bull from Pope Clement VII for the purpose, and in the following year the Church of St. Frideswyde became the chapel of his new foundation, Cardinal College. To make way for the building of his great quadrangle he ruthlessly sacrificed three bays of the nave. In 1546 Henry VIII recreated the foundation under the title of "The Cathedral Church of Christ in Oxon," and made it the site of the newly-created See of Oxford. Since then it has served the double purpose of Cathedral and College Chapel. The building suffered a great deal at the hands of Brian Duppa, who was Dean from 1629 to 1638. He removed the old stalls to the Latin Chapel and replaced them with high seats backed with panelling of oak, for which he sacrificed the monuments on the pillars. He paved the choir with black and white marble and other parts with stone slabs, removing the old memorial-stones, many of which were lost or destroyed, Anthony Wood says, "having most of them Saxon inscriptions on them." He cut away the beautiful Gothic tracery from the windows substituting others of two lights, removed the priceless old glass of the Priory Church, representing stories from the life of St. Frideswyde, and the arms of the benefactors, and inserted Dutch glass, by Abraham Van Ling. The side chapels he separated by stone screens and closed the west end of the choir with an organ-loft. Little or nothing more was done to the cathedral until 1856, when Dean Liddell commenced the restorations that have been so well carried out. Under the direction of Mr. John Billing, Duppa's high pews and panelling were replaced by the present stalls, and the gallery and organ-loft were removed. In 1870 Sir G. G. Scott was consulted, and in his able hands the building was restored to its present admirable condition. At the east end he took out the great window that Duppa had altered from a five-light to a three-light, and substituted the present wheel window, with intersecting arcading, and two round-headed windows below, carrying out the original design of Robert of Cricklade as far as was possible from conjecture and traces of original work that he discovered. The other windows were restored in like manner. Among other restorations and improvements the lantern story of the tower was opened and the bells were removed to the new belfry constructed by Mr. Bodley in 1880 over the hall staircase. At the same time a new bay was added to the nave, forming an ante-chapel, and the new western porch leading from Tom Quadrange was thrown open under the direction and from the designs of Mr. Bodley.

The best view of the exterior is to be obtained from the garden of the Professor of Pastoral Theology. From here the tower and spire and the north transept, with its two pinnacled turrets, are well seen. The lower story of the tower is Norman, the belfry and spire being Early English. The spire is particularly interesting as being perhaps the earliest in England. The Latin Chapel, with its four fine decorated windows and buttresses, is most picturesque. Passing to the east end we see the three Saxon arches discovered by Mr. Park Harrison, the centre one being partly concealed by a flat Norman buttress. In front of these he also discovered, by excavation, the foundations of three apses into which the arches would have led. These are now covered up, but Mr. Harrison made very careful plans of them, which have been published with a paper he read before the Royal Archaeological Institute in 1887. On the south side is the cathedral cemetery, where repose the remains of Dr. Liddell and his daughter Edith, Phillip Edmund Pusey, son of Dr. Pusey, Mrs. Paget, wife of the Bishop and Dr. Moberly. The beautiful flamboyant tracery in the east window of the Lady Chapel is best seen from here, also the east end of the Chapter House. The slype passing under the vestry in the south transept leads from the cemetery to the cloisters.

On entering the Cathedral by the new western porch the first impression is that you are in a building of great architectural beauty and interest, but of unusual proportions, and you feel what has been lost by Wolsey's destruction of the three western bays of the nave. The nave is probably the work of Robert of Cricklade, the restoration having been commenced by him after the Pope's Charter had been secured in 1158, though it may have been commenced by Guimond, the first prior of the Augustine Canons Regular. The clerestory windows are probably Prior Robert's. The roof of the nave is sixteenth century, that of the transepts being a little earlier. The tower is transitional, and, it will be noticed, is not square. The east and west arches are round, the north and south being pointed. The choir has four bays and a presbytery. It is probably of the same period as the nave, excepting that, according to Mr. Park Harrison, two of the capitals are far older than the others, and by their weathered appearance and a careful comparison of details in Saxon MSS. with the carving on these capitals, he puts them down as part of Ethelred's restoration in 1104. He also points out a capital in the south choir aisle as Saxon and attributes one of the clerestory windows in the South Transept to Ethelred. These statements are disputed by high authorities; I therefore give them for what they

may be worth, as it is an interesting question. The fan tracery of the choir is deeply recessed with delicate lantern pendants, and is said by Fergusson to be the best example of its kind in England. In the east wall of the north choir aisle and the Lady Chapel we find the only visible remains of St. Frideswyde's Church. Here are the two built-up arches, with indications of a centre arch covered by a pillar, already alluded to as having been discovered by Mr. Park Harrison. In the apse to which the southernmost of these arches led, it is conjectured the remains of St. Frideswyde were first laid, and that this is the "obscure place" in which they remained until their translation in 1158 by Robert of Cricklade. The Latin Chapel was for some time used for the lectures of the Regius Professor of Divinity until Dr. Liddell had it refitted as a chapel. The west bay formed a part of the north transept aisle, the second bay is thirteenth century, the third and fourth having been added in the fourteenth century, when the vaulting was put up. Some of the stalls belonged to the Priory Church, and were removed from the choir by Dean Duppa. There are also some that it is supposed were made for Wolsey's Chapel, bearing the Cardinal's hat. The Jacobean pulpit formed at one time the Vice-Chancellor's seat in the choir. The altar table was until 1890 in the presbytery. When the chapel was being refitted an arched recess was found in the north wall that may have been the tomb of the founder, or more probably an Easter Sepulchre. The south choir aisle is of Ethelred's time. St. Lucy's Chapel, which is now used as a baptistery, is Norman, the east window being decorated with rich flamboyant tracery. The font is the first ever used in the cathedral, and was placed here in 1882. It is of Rosso-antico marble with a lofty cover of oak elaborately carved from designs by Mr. Bodley. The vaulting of the aisles of the nave and transept is twelfth century. The reredos was presented anonymously in 1881; it is in red Dumfries sandstone with figures in Rosso-antico marble carved by Brindley from designs by Mr. Bodley. The centre subject represents the Crucifixion. The high altar is of cedar wood, the beautiful embroidered super-frontal being the work and gift of Dr. Liddell's daughters. The silver-gilt alms-dish and the candlesticks are dated 1661, and the bible and prayer-book 1634. The lectern is a very handsome specimen of brasswork and was the gift of the Rev. T. Vere Bayne and the Rev. H. L. Thompson. The pulpit and canopy of carved oak is of good Jacobean design. The organ screen, which is now at the west end of the nave, is the same that Dean Duppa erected, and contains an organ of fine tone, built by Willis & Son in 1884.

As I have described earlier in my paper, the shrine of St. Frideswyde was destroyed during the Reformation (1538). While the restorations of the Cathedral by Dr. Liddell were being carried out, various portions of the marble shrine were discovered, many of them lining a well in the Cathedral grounds, others built into the walls and in many other places. These were collected and have been very carefully fitted together. The restored shrine now stands on the south side of the Lady Chapel, and there is sufficient to show it must have been of great beauty. The carving, which represents the flowers and plants of the neighboring country, which Frideswyde loved so well, is exceedingly delicate and effective. The watching chamber is of the fifteenth century. It is not known for what purpose it was constructed. Probably as a watching chamber for guarding the precious jewels on St. Frideswyde's shrine. Some imagine it may have been intended as a third shrine of the Lady Saint. It is a beautiful specimen of Perpendicular work, the lower part being of finely carved stone forming an altar tomb and canopy, on the tomb being the matrices of two brasses. The upper chamber is of wood most delicately carved. Other monuments in the Lady Chapel are to the memory of Elizabeth Lady Montacute, the Alexander de Sutton, Prior of St. Frideswyde's 1294 to 1314, Sir George Nowers (d. 1425) and Robert Burton (d. 1639). In the south choir aisle, to Bishop King (d. 1677), Bishop Mackarness, Prince Leopold, and a brass to Stephen Pence (d. 1587). In the south transept, to Viscount Brownker (d. 1445). In the south nave aisle, to Dean Corbet (d. 1688) and James Zouch, Monk of the Priory 1503. In the nave, to Dean Aldrich (d. 1710), Bishop Berkeley (d. 1753), and Dr. Pusey (d. 1882). In the ante-chapel, to Dean John Fell (d. 1684), the only Dean of Christ Church who became Bishop of Oxford, and Dean Gaisford (d. 1855).

The oldest glass in the Cathedral is in the east window of St. Lucy's Chapel; it dates from early in the fourteenth century and is very fine. Other fourteenth-century glass spared by Dean Duppa is in three of the side windows of the Latin Chapel. One of the most interesting windows is in the south choir aisle representing Bishop King, with a view of Oseney Abbey in the background, attributed to Van Ling. At the west end of the north aisle is the only window put up by Dean Duppa that is left. It is of very rich coloring and represents Jonah sitting under his gourd, with a view of Nineveh in the background. The east windows of the Lady Chapel and the north and south choir aisles are by William Morris from designs by Sir Edward Burne-Jones. That in the Lady Chapel is to the memory of Frederick Vyner (d. 1870), and represents Samuel, David, St. John and Timothy; in the north aisle is the "St. Cecilia" window, presented by Dr. Corfe in 1873, and in the south aisle the "St. Catherine" window, in memory of Edith Liddell (d. 1876). In the Latin Chapel is "St. Frideswyde's" window. This is from one of Burne-Jones's earliest designs, and is very rich and beautiful in effect. It represents scenes from the life of the Saint, and was carried out by Powell of Whitefriars. Another of Burne-Jones's early works is at the west end of the south

nave aisle, and represents "Faith, Hope and Charity." It is to the memory of Edward Denison, the founder of the Oxford Settlement in the East-end of London. Clayton & Bell are responsible for the glass in the wheel window at the east end given by Dr. Liddell, and the two round-headed windows given by Sir John Mowbray. Also the half-window in the south transept in memory of Dr. Liddell, the large window in the north transept and several windows in the aisles. The glass in the clerestory windows of the two transepts is by Henry and Alfred Gerenté (1854), and was removed from the former east window.

BOOKS PAPERS

DR. MACMILLAN'S book¹ is an enthusiastic panegyric upon the work and the ideas which prompted the work of the painter; and were it not for the affectation of rough edges to the hand-made paper, which prevent one turning over less than four or five pages stuck together, and consequently the complete upset to the reader's temper, the book would be interesting. Why this return to the ways of our bookbinding ancestors should be considered more artistic than profiting by the invention of the cutting-machine, one cannot understand. Possibly we shall live to see rush-lights supersede Price's night-lights, and the tinder-box our modern matches.

The author gives but little information as to the life of Mr. Watts—that is natural—but we have, of course, some account of what he eats and drinks, and when he works and sleeps. That is *en règle*, whether the subject of a book be an artist or a statesman, a doctor or an explorer. But some of Dr. Macmillan's theories are, to say the least, a little exaggerated. For instance, speaking of Mr. Watts's delicate constitution, he says: "The phosphorescence of the unseen world requires to be developed by senses that are somewhat touched by decay. . . . When the senses are robust, the spiritual powers seem to languish; and, on the other hand, the spiritual powers, like some beautiful orchidaceous growth, develop best in a constitution that is feeble and decayed." "Decayed senses and constitutions" seem to most of us anything but pleasant, and remind us of the poor "decayed ladies" of former years. Undoubtedly strong minds often find themselves in feeble bodies, but the bodies need not necessarily be "decayed."

We are told that Mr. Watts uses neither palette nor maulstick, as if the omission of the one was as extraordinary as that of the other. Nor does the artist employ models; but possibly some of his pictures—"Love and Life," to wit—might have gained if he had. As to the author's knowledge of painting pure and simple, such a sentence as the following leaves a good deal to be desired: "Judged by mere technical skill, Tadema and Leighton are better as mere painters." It would have been difficult to hit upon two painters who have less technical skill in mere painting (brush-work), and if the author means color and composition under the word *technique*, surely Mr. Watts is England's greatest painter.

As a man's portrait-painter he is supreme. John Stuart Mill, George Meredith, William Gladstone, Lord Dufferin and a host of others are magnificent studies; Watts's gallery of national notabilities is unique and priceless. For years he has been carrying out this idea, and fortunately his long life has enabled him to paint most of the celebrities of the Victorian era, but there was no need to comment thus upon the fatigue which followed the arduous work. "Virtue must have gone out of him through the touch of other natures, as it went out of our Saviour at the touch of the suffering woman's hand on his robe."

Dr. Macmillan's book is, as we have said, a panegyric, not a criticism. Thus he has praise even for "Jonah," that arch-screamer which hung in the Academy some years ago; but of the exquisite "Paolo and Francesca" too much cannot be said. Dr. Macmillan compares it with Ary Scheffer's picture, which is quite unnecessary in these days, for I doubt whether any one with the most limited knowledge of art would do more than give a passing glance to any work of the French painter. Mr. Watts's picture is one of his finest works, possibly the finest of his easel-pictures, for it is not only the embodiment of Dante's idea, but it fulfils all the conditions of a perfect work of art. Whether it be necessary to give unstinted praise to the painter's morals and allegories in paint is a different question, but all lovers of birds must bless him for his effort to crush the "murderous millinery" which causes the slaughter of millions of God's most beautiful creatures for mere fashion's consumption: the "Shuddering Angel" ought to be reproduced cheaply and distributed all over the world by the bird-protecting societies, for the wholesale slaughter even of herons for the *aigrette* still goes on merrily in spite of a widespread knowledge of the dismal facts.

Another of the artist's magnificent ideas is the beatification of the obscure heroes of commonplace every-day life—the policemen who jump into the water fully clad to save some miserable woman who attempts to draw the veil over her wretched life, or the nurse who sacrifices her own life to save the children under her care. These peaceful heroes' deeds are now, some of them, recorded in the Postman's Park, Aldersgate Street, and it is to be hoped that

some day the walls of other public gardens may be utilized in the same manner.

In "Love and Death" Mr. Watts is grandiose in conception, but "Love Triumphant" strikes one as being too akin to "Jonah." Again, the designs for the two spandrels at St. Paul's make one wish that Mr. Watts could have designed the mosaics for the rest of the Cathedral in collaboration with Sir William Richmond. There is no comparison between the effect of the two methods of mosaic-laying employed; the Salviani-made spandrels are dull and might be oil-paintings, whereas the choir decorations glitter and glisten in the light with magnificent effect. But whereas Sir William's designs are more or less Byzantine, Mr. Watts's are Michael-Angelesque and, so, appropriate to the building.

In Dr. Macmillan's chapter on Pre-Victorian art we find statements which set one thinking in opposition. To place Etty after Hilton, and Sir Charles Eastlake first, is curious; and to speak of a "high-water line reached by Wilkie, Reynolds, Mulready and Maclise" makes one ejaculate, "Poor Sir Joshua!" Nor can we see where the Pre-Raphaelitism of "Love and Death" comes in. Of course Watts was one of the brotherhood, but he soon shook off the principles of the movement. Dr. Macmillan is not the only critic who has lately been expounding theories upon the immorality of French art, as "art for art's sake," and the virtues of the British artist, who "always paints seriously for a high purpose." Some do, of course. Mr. Watts does, without doubt; but may not the truth be stated thus? Whatever the subject of the French artist's work may be, the workman knows his craft, whereas the British painter, who "never paints meaningless pictures (!)," is often totally ignorant of the proper use of a brush—Maclise, for example, and many later followers. "Art to them is sacred"—possibly this may apply to "The Two Crowns"—yet we cannot see "the lofty purpose" such a picture serves, although it figures among the Chantry Bequest collection at the Tate Gallery.

It is more probable that Mr. Watts's portraits will survive his moralities and allegories, for they are instinct with life; and is it not a fact that when we speak of Rembrandt, Rubens, Vandyke and Velasquez we instinctively think of their portraits? No doubt they, like Mr. Watts, were "preachers"; but it is their "art for art's sake" which we admire, not their readings of myths and allegories and sacred subjects. Rembrandt may have been a boor, and Rubens and Velasquez courtiers, but they may also have had lofty ideas which they tried to put into paint; but we value far more their incomparable portraits than the "Woman Taken in Adultery," "The Descent from the Cross" and "The Flagellation."

ILLUSTRATIONS

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

BIRD'S-EYE VIEW OF THE PALACE OF THE POPES, AVIGNON, FRANCE.

THIS and the following plate are copied from *La Construction Moderne* and are interesting when taken in connection with the description of the group published in the *American Architect* for May 9 last.

PLAN AND SECTIONAL VIEW OF THE SAME. RESTORATIONS SUGGESTED BY M. NODET.

HOUSE OF W. B. THAYER, ESQ., KANSAS CITY, MO. MESSRS. ROOT & SIEMENS, ARCHITECTS, KANSAS CITY, MO.

THE DRAWING-ROOM: HOUSE OF A. W. MEYER, ESQ., KANSAS CITY, MO. MESSRS. VAN BRUNT & HOWE, ARCHITECTS, KANSAS CITY, MO.

HOUSE OF MRS. A. W. ARMOUR, KANSAS CITY, MO. MESSRS. VAN BRUNT & HOWE, ARCHITECTS, KANSAS CITY, MO.

SKETCH FOR PSI UPSILON CHAPTER-HOUSE: BOWDOIN COLLEGE, BRUNSWICK, ME. MR. JOHN CALVIN STEVENS, ARCHITECT, PORTLAND, ME.

Additional Illustrations in the International Edition.

REAR VIEW: HOUSE OF A. W. MEYER, ESQ., KANSAS CITY, MO. MESSRS. VAN BRUNT & HOWE, ARCHITECTS, KANSAS CITY, MO.

FIREPLACE IN THE SAME HOUSE.

REAR GALLERIES: WOOLSEY AUDITORIUM, Y. U., NEW HAVEN, CONN. MESSRS. CARRÈRE & HASTINGS, ARCHITECTS, NEW YORK, N. Y.

SIDE GALLERY OF THE SAME.

THE NEWBERRY ORGAN IN THE SAME.

THE VESTIBULE IN THE SAME.

¹ "The Life-work of G. F. Watts, R. A.," by Hugh Macmillan, D.D., etc. Reproductions from photographs by Hollyer, Dent & Co. London. 4s. 6d.

NOTES & CLIPPINGS

THE INFLUENCE OF FRANZ JOSEF ON ARCHITECTURE.—“The Austrian Emperor's private life is characterized by soldier-like simplicity,” says a writer in the *Westminster Gazette*. “He is an early riser, a hard worker, and seldom attends theatres or other places of amusement. Shooting and hunting are still his principal recreations, and this doubtless accounts for the excellent health which he continues to enjoy. All who approach him on matters of business admire his inexhaustible patience and perfect good humor, his frankness and strict regard for truth, together with his marvellous memory and facility in grasping details. In money matters the Emperor's liberality is princely, and his munificence, especially where the poor are concerned, is proverbial. It may not be so well known that he is an excellent draughtsman, and in his younger days was a prolific caricaturist. The Emperor is also fond of building. He has created and supported a whole school of architects, and such things as the magnificent boulevard of the Austrian capital and some of the additions to the palaces in Vienna and Budapest will worthily preserve his fame in this regard.”

A LOST ISLAND.—Of the various buildings which adorned the island of Philæ there remain to-day above water only a portion of the colonnade, the top of the kiosk, and a part of the Temple of Isis. The traveller approaches the ruins in a small boat, in which he may pass down the colonnade and row about in the once sacred chambers. It is a novel and interesting experience, but to those who were familiar with the island in all its beauty it is full of sadness. Of the columns which formed the colonnade only the capitals remain above water. Upon these one sees, beautifully chiselled and ornamented with delicate coloring, Tiberius offering gifts to the gods or Nero presenting two eyes to Isis. A short distance to the right, the roof of the kiosk is visible, resting upon its exquisite columns, which are partly submerged. By it two unusually large palm-trees rear their heads above the inundation. — *The Century for October*.

DISCOVERIES IN THE VALLEY OF THE SARNO, ITALY.—The most recent excavations show that Vesuvius began its work as a conservator of antiquity earlier than the memorable year A. D. 79. During the excavation in the Valley of the Sarno, near San Marzano, some most interesting antiquities have come to light. These had been covered up by a volcanic deposit about six feet thick, which must have taken place in the seventh century before Christ. The relics include a Greek burying-place, archaic Italian tombs, and various bronzes and terra-cottas. — *Boston Transcript*.

THE THREE DUMAS.—The Place Malesherbes, near the Parc Monceau, in the northwest of Paris, is adorned by a memorial of Alexandre Dumas which is the work of Gustave Doré; it is suggestive of the great creator of romances, for on one side of the pedestal we see the figure of D'Artagnan, and on the other a workman reading one of the marvellous books to a young woman. Everybody was satisfied to have a public recognition of a writer who afforded immense enjoyment not only to Frenchmen, but to readers in all countries, yet was never able to attain admission into the Academy. One of the proofs of the gratification of Parisians was given in the proposal that memorials should also be erected in the Place to General Dumas, who was one of the revolutionary warriors, and to Alexandre Dumas fils, who was also a writer and the foremost dramatist of his time. The latter is the work of M. Saint Marceaux, and may now be said to be completed. The idea inspiring the work has given scope for an admirable combination of figure sculpture, for around the pedestal will be represented the principal heroines created by the author, from “Margaret Gauthier, La Dame aux Camélias,” the first of the creations, to “Denise,” who may be considered the last. General Dumas is shown as he appeared in his attack on the bridge of Briden. The name of the Place will no doubt soon be changed, for it is popularly known as La Place des Trois Dumas. — *The Architect*.

BUILDING IN FROSTY WEATHER.—Mr. Graham, the British Consul-General at Stockholm, in his report, mentions that in winter one hears much about the want of employment for bricklayers and others in the United Kingdom on account of frosty weather. Yet any one residing in Stockholm during the winter months can see bricklaying carried on in hard frost as an everyday occurrence. The art of building, the Consul-General observes, stands very high in Stockholm, much of the work done being both ornamental and of excellent quality. A few years ago a series of experiments were carried out to decide the lowest temperature at which bricklaying might be effectively carried on. Three different temperatures decided on were twenty-three degrees, fourteen degrees and six degrees Fahr. The bricks and mortar were, as to quality and conditions, such as are commonly used in Stockholm. The walls thus erected during the winter were allowed to stand till the following autumn, when they were torn down and the results noted were that those built at twenty-three degrees and fourteen degrees were perfectly satisfactory, the mortar being quite hard and sound and had to be scraped from the bricks. Those laid at six degrees were not satisfactory; the mortar did not adhere to all the bricks, which lay loosely imbedded in it. These results tend to prove that without any special precaution as to material or labor bricklaying can be carried on in Stockholm at a temperature as low as fourteen degrees Fahr., or eighteen degrees of frost. Generally, it may be said that the mortar should be made in a room where the temperature is kept well above freezing point. The brick used in Sweden is of a light or porous character,

which readily absorbs the moisture from the mortar. Hard pressed or calcined bricks and stonework generally are not suitable for building during frosty weather, but edgings or ornaments, etc., of such material can easily be dealt with by slightly warming them before bringing them into position. This can be done by keeping them a few days in a wooden shed heated by an open coke stove. In some cases it is found advisable to cover-in with rough boarding the part of the wall where such stonework is extensive; then a very small coke fire is found sufficient to keep the temperature high enough to prevent any damage to the mortar. But although brick building can thus be carried on safely under any of the temperatures already named this does not apply to plaster or cement work, which should not be done at or below freezing point, unless proper heating arrangements are made. In Stockholm fifteen or twenty years ago almost all building was broken off during four or five months every winter; it is now the exception that it is hindered by frost more than a few days or a few weeks annually. Mr. Graham sums up the matter shortly thus: (1) The bricks should be porous and perfectly dry, that they may readily absorb the moisture in the mortar; (2) the water, sand and bricks must all be heated. — *Building News*.

THE WELL IN THE TOWER OF LONDON.—For ages antiquary after antiquary found himself baffled by a simple problem at the Tower. How, in the old days, did the garrison get a supply of drinking water? The antiquary could show you the original fireplace at which William the Conqueror warmed his hands, could point approximately to the spot on which the murdered Princes fell; he could lead you to the place where Henry VIII's queens were butchered, and to the tombstone that collapsed upon their poor bones; he knew the tiny dungeon in which Sir Walter Raleigh spent twelve dreadful years hidden from the light; and could have you in a twinkling in the stone dog-kennel where still remains the ring to which they chained Guy Fawkes. But how these unfortunates and their janitors drank, none could tell. The Thames hard by was not the source, they were sure. Organized search was in vain. Then there came a thick-headed, unimaginative mason, to whom and his fellows the work of converting certain of the historic dungeons into storehouses for war material meant ninepence-halfpenny an hour and no more. His pick struck through the flooring of the corridor from which the prisoners used to enter their cells. Behind these latter, and corresponding with the main one, ran, and still remains, the little secret corridor along which eavesdropping officers tip-toed to listen to conversations between captives, for the purposes of evidence. A few blows from the pick brought to light the mouth of a pit. Sixty feet down was water—30 feet of it. The mason had happened upon the historic well for which search had been made in vain for centuries! It was as perfect as the day that the Conqueror sunk it. To-day it still carries its 30 feet of sweet spring water, and should ever the Tower be beleaguered, its garrison would still be independent of outside supply. We have our holy wells, our miracle-working wells, and wells of medicinal waters. If this historic old shaft which the mason brought to light were distant 10,000 miles, Londoners would make pilgrimages to drink its waters. — *St. James's Gazette*.

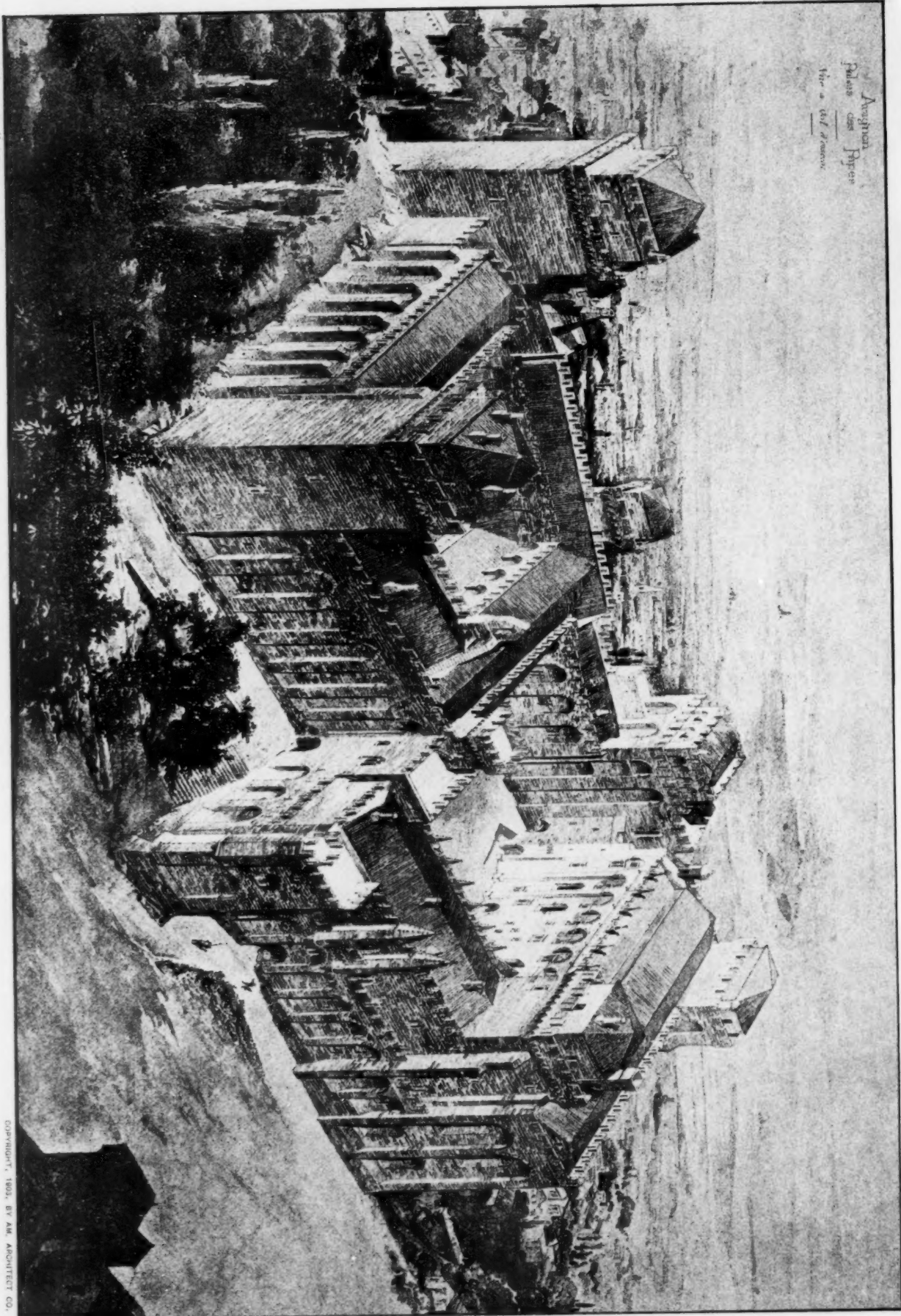
FIXTURES FROM AN INSURANCE POINT-OF-VIEW.—The lower floor of a building in Albany, owned by Goldborough Banyer, was used as a dry goods store, in which was situated a quantity of shelving and counters. The counters and shelving were not framed or built with or into the building, and were capable of being easily removed without injury to themselves or to the building. A policy of fire insurance which was issued to Mr. Banyer by The Albany Insurance Company recited in typewriting that the insurance was “on his brick, metal and asphalt roof building, including gas, steam and water-pipes, and all other permanent fixtures contained therein, occupied for stores, offices and other hazardous and extra hazardous purposes.” A printed clause provided: “This company shall not be liable for . . . nor unless liability is specifically assumed hereon for loss to awning . . . store or office furniture or fixtures.” On the submission of a controversy between Mr. Banyer and the insurance company as to whether the words “all other permanent fixtures” included the counters and shelving, the Third Appellate Division has given a decision against the former. “In the description of the property named as insured,” said Justice Smith, for the court, “is included gas, steam and water-pipes, and all other permanent fixtures contained therein.” It is a familiar rule of interpretation of contracts that words must be construed in the light of other words in connection with which they are used. The words “all other permanent fixtures” are used in connection with such fixtures as gas, steam and water-pipes. It would seem to me to do violence to this rule of interpretation to hold that these store fixtures which it has been stipulated could be easily removed without injury to them or to the building, were of the same class of permanent fixtures as gas, water and steam-pipes.” — *N. Y. Times*.

GAS-DRILLING DANGEROUS TO COAL-MINES.—“The continued drilling in Ohio for oil and gas and the consequent raising of the gas to the coal surface is, and will be, a source of very great danger in coal-mining for years to come,” says State Inspector Bissison, of Ohio. — *Exchange*.

TARRED ROADWAYS.—Tarring the roads in France is becoming the vogue, and road engineers are busy testing this system of dust laying. — *Exchange*.

PAPER TELEGRAPH POLES.—Paper telegraph poles are one of the developments of the art of making paper useful. The paper poles, now used to some extent in Belgium, are said to be lighter and stronger than those of wood, and to be unaffected by causes which shorten the life of a wooden pole. — *Boston Transcript*.

Avignon
 Palais des Papes
 Vue du Rhône

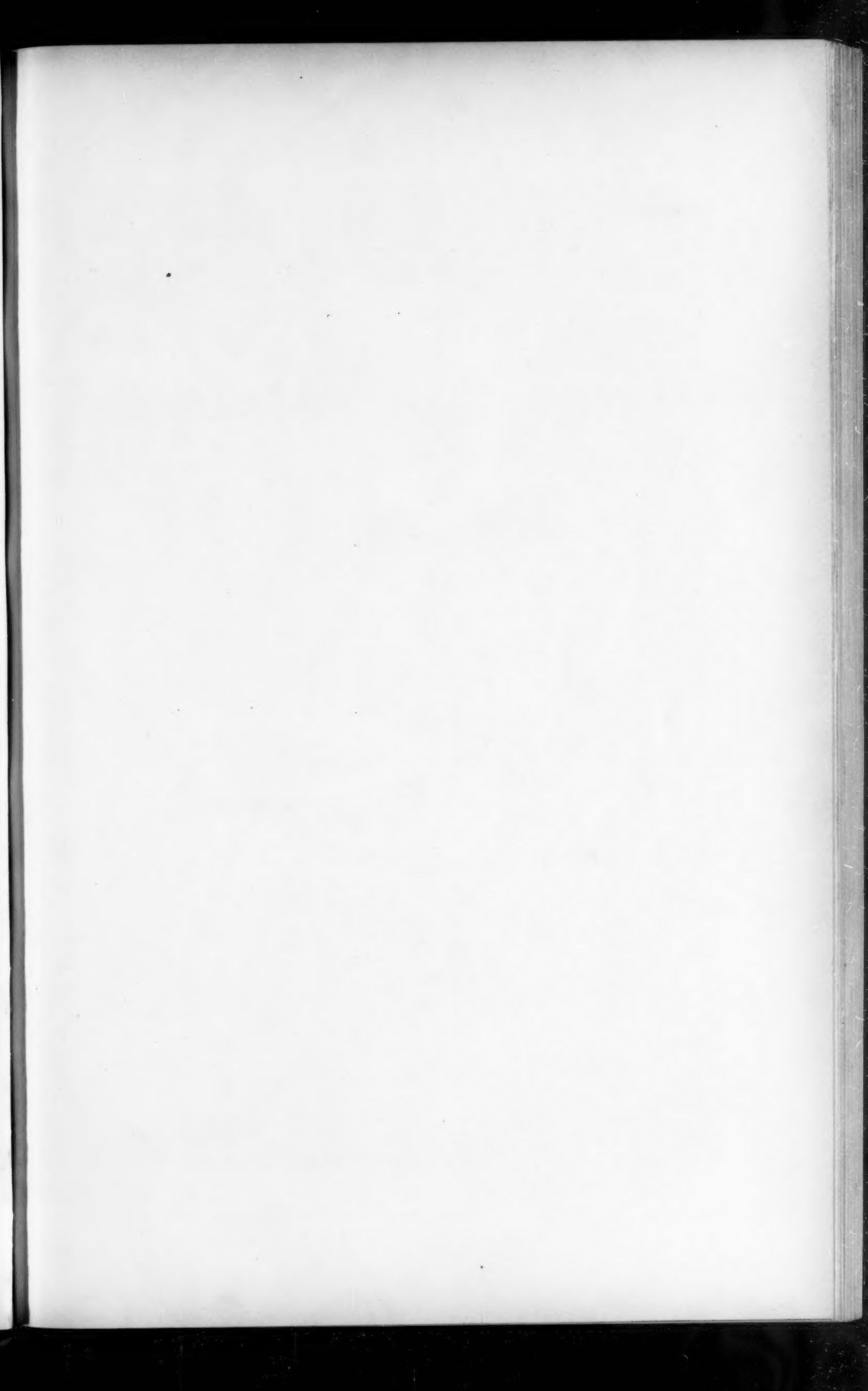


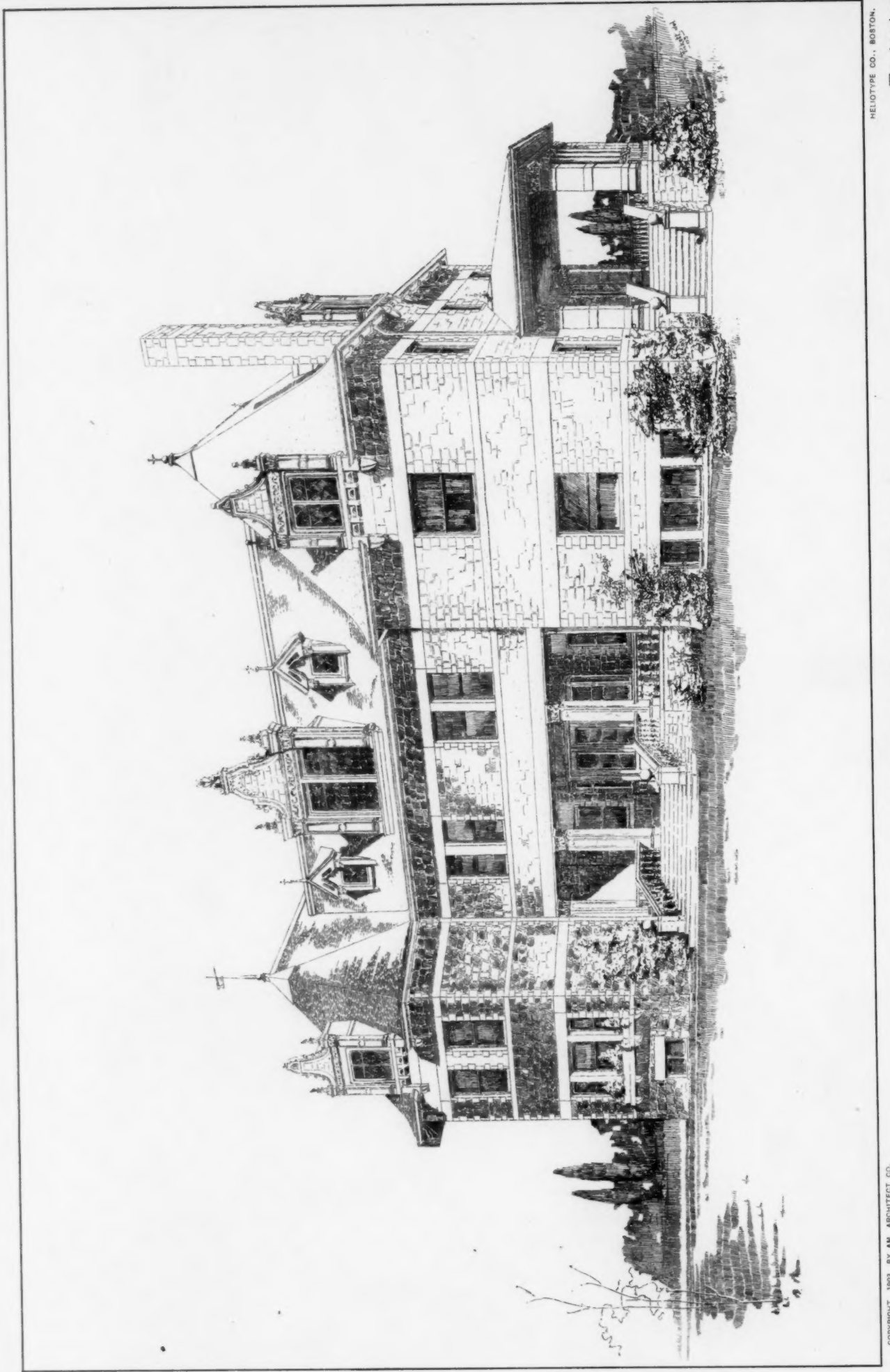
FROM LE CORBIUSIER MUSEUM

THE PALACE OF THE POPES, AVIGNON, FRANCE.

COPYRIGHT, 1903, BY A.M. MONTGOMERY CO.

The American Architect
 Oct. 3, 1903.
 No. 1449.



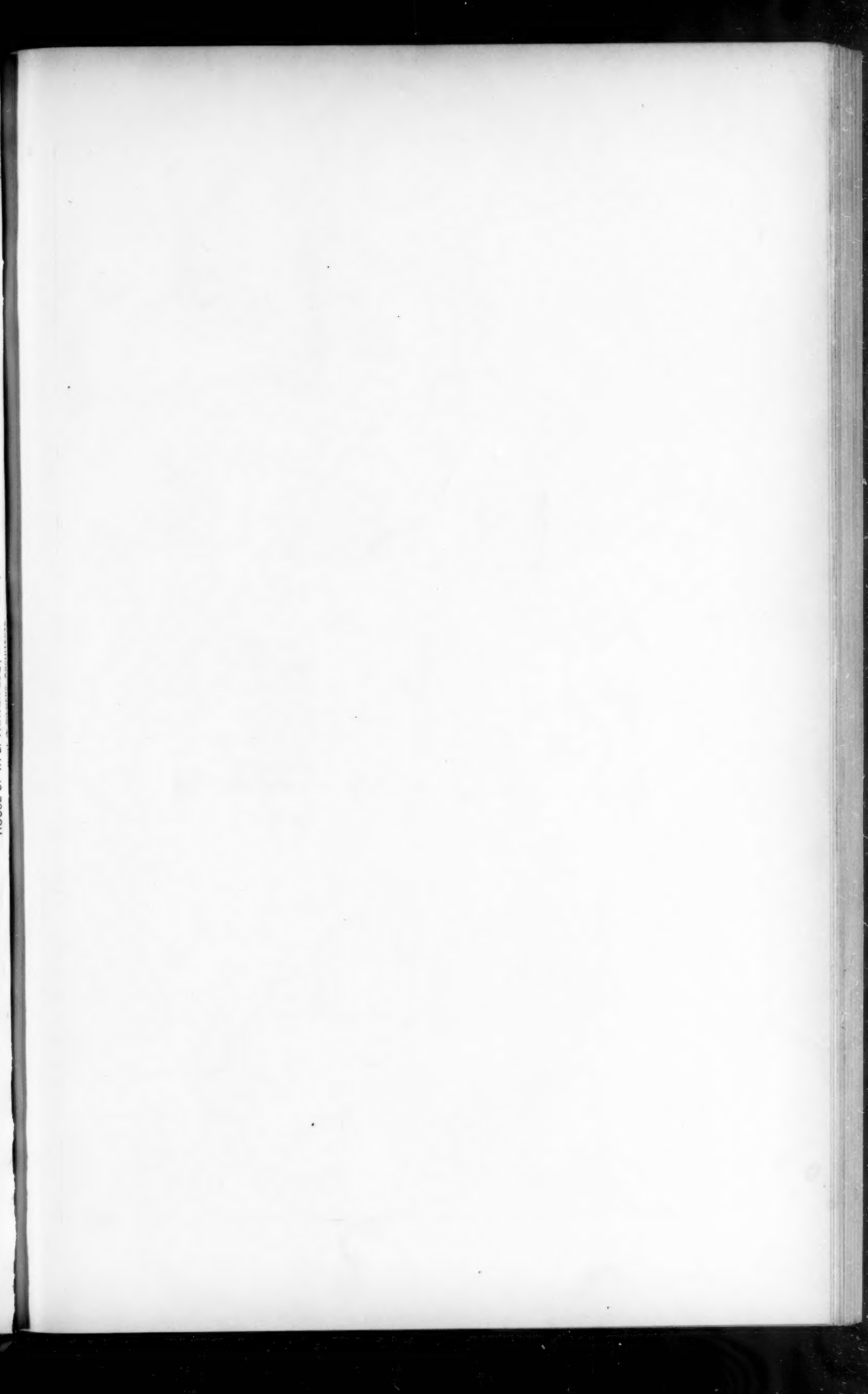


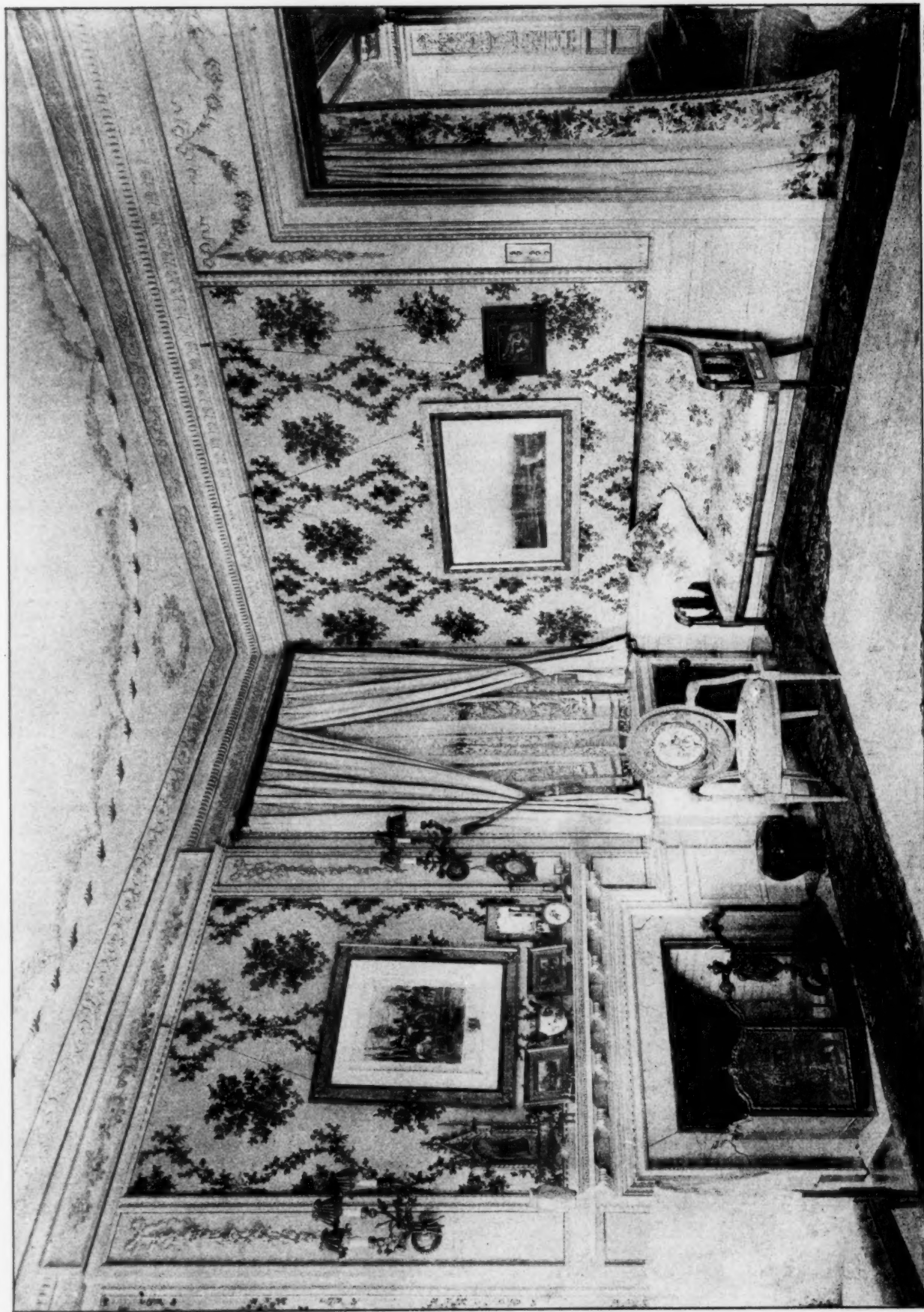
COPYRIGHT, 1903. BY AM. ARCHITECT CO.

HOUSE OF W. B. THAYER ESQ., KANSAS CITY, MO.

HELIOTYPE CO., BOSTON.

The American Architect



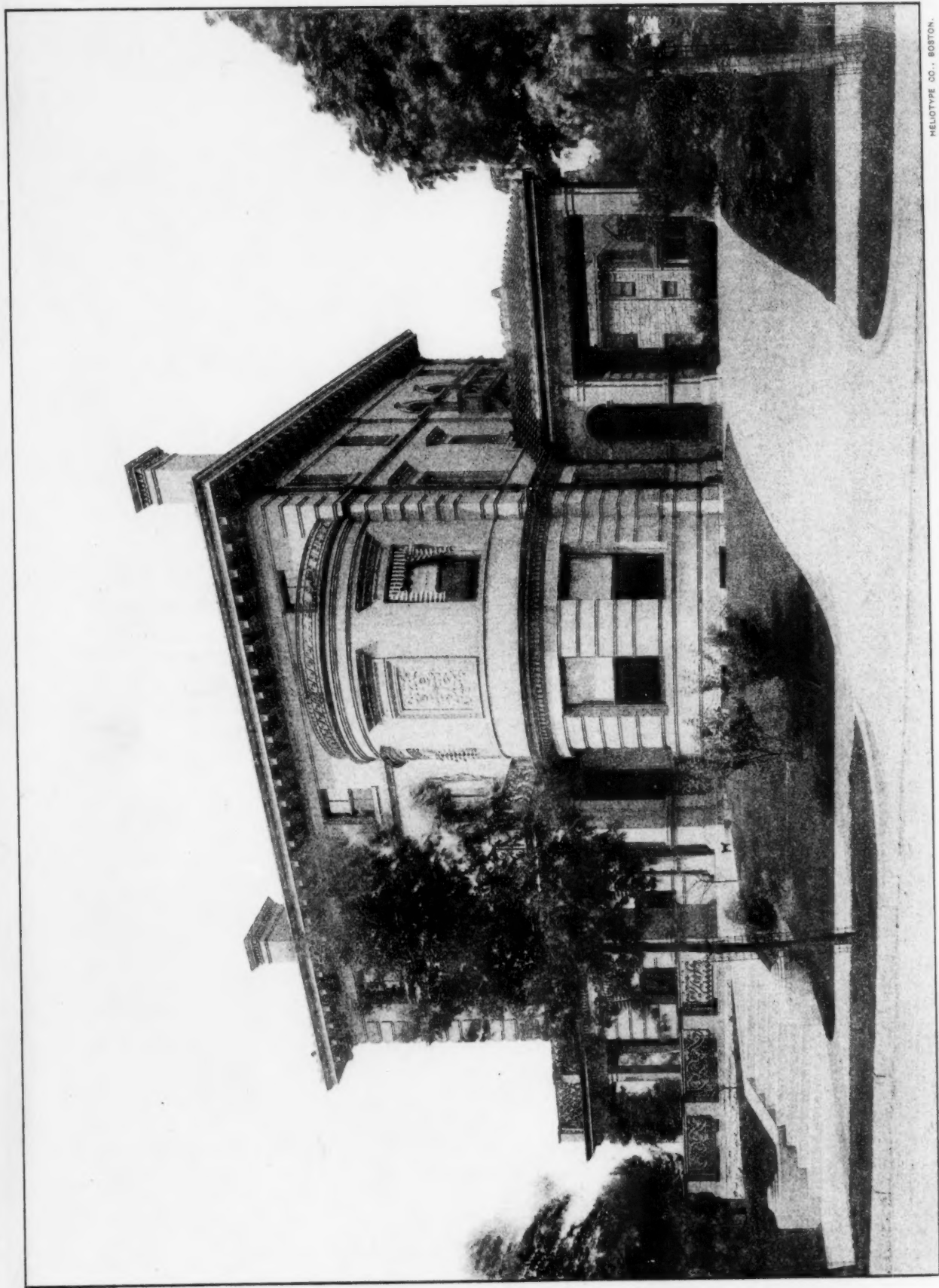


COPYRIGHT, 1903, BY AM. ARCHITECT CO.

DRAWING-ROOM: HOUSE OF A. W. MEYER ESQ., KANSAS CITY, MO.

HELIOTYPE CO., BOSTON.

The American Architect

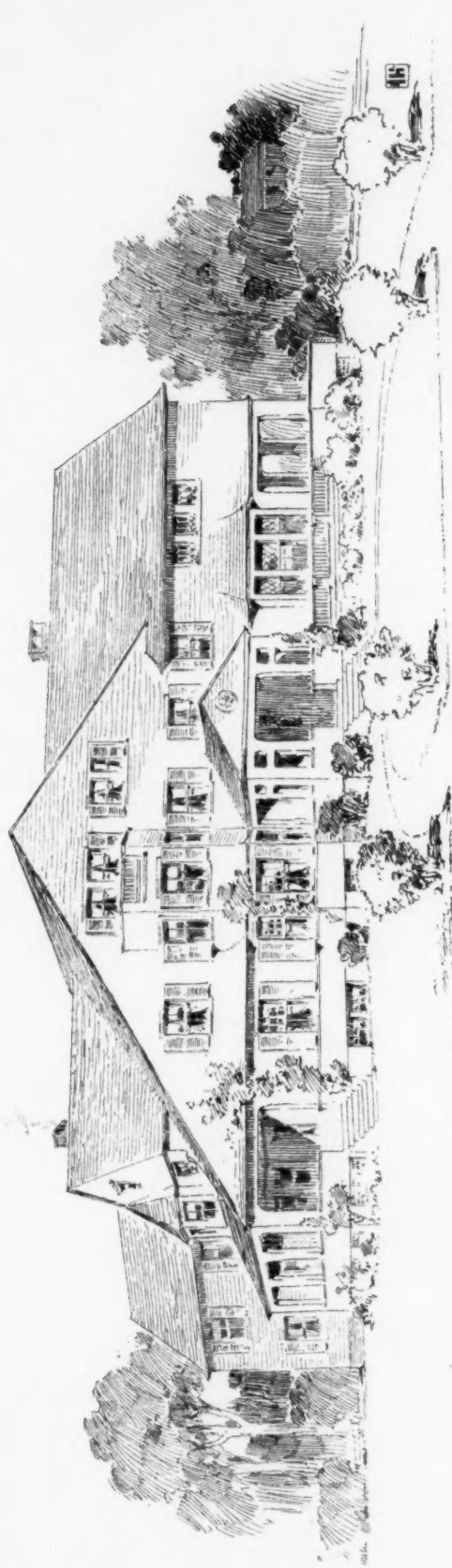


COPYRIGHT, 1903, BY A. W. ARMOUR ARCHITECT CO.

HOUSE OF MRS. A. W. ARMOUR, KANSAS CITY, MO.
VAN BRUNT & HOWE, ARCHITECTS.

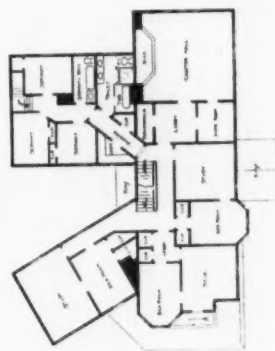
HELIOTYPE CO., BOSTON.

The American Architect
Oct. 3, 1903.
No. 1449.



SKETCH FOR CHAPTER HOUSE
FOR THE
PSI Upsilon FRATERNITY
BOWDOIN COLLEGE

John Calvin Stevens, F.A.I.A.
Architect



Second Floor Plan

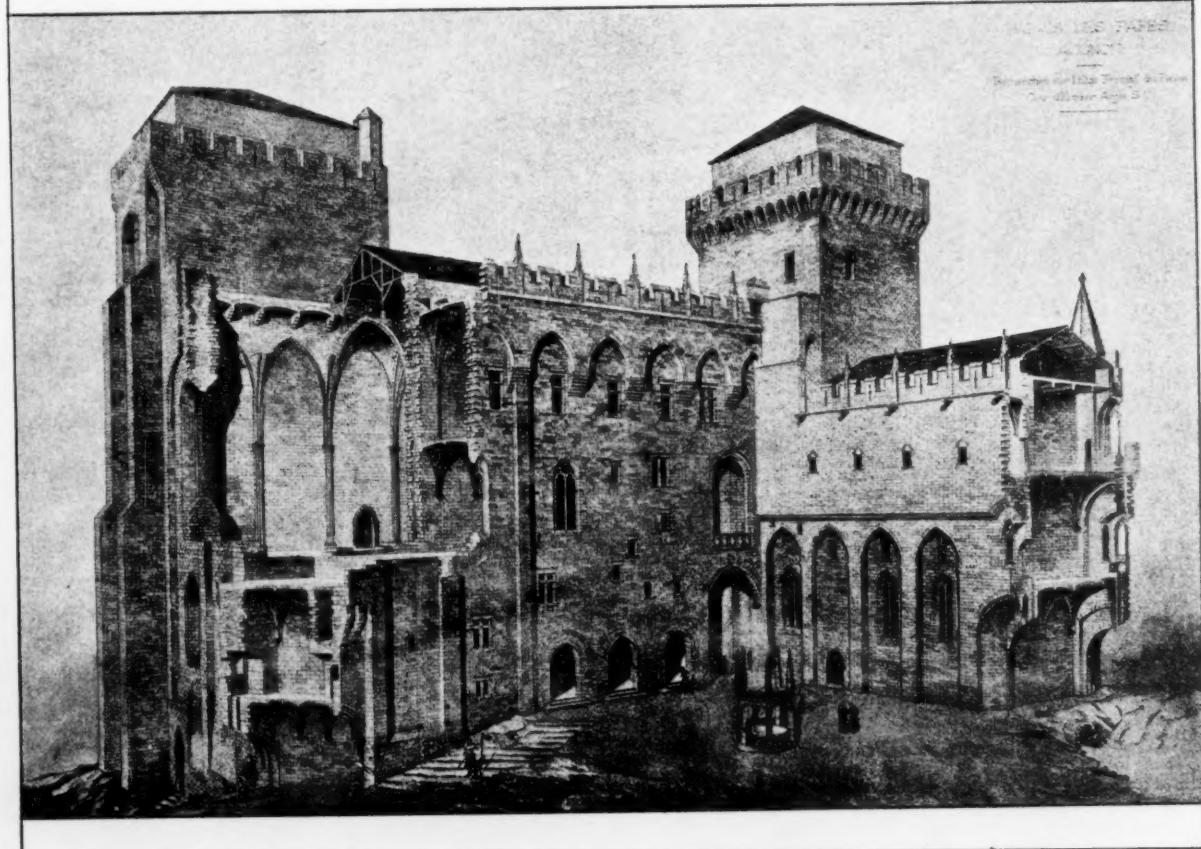
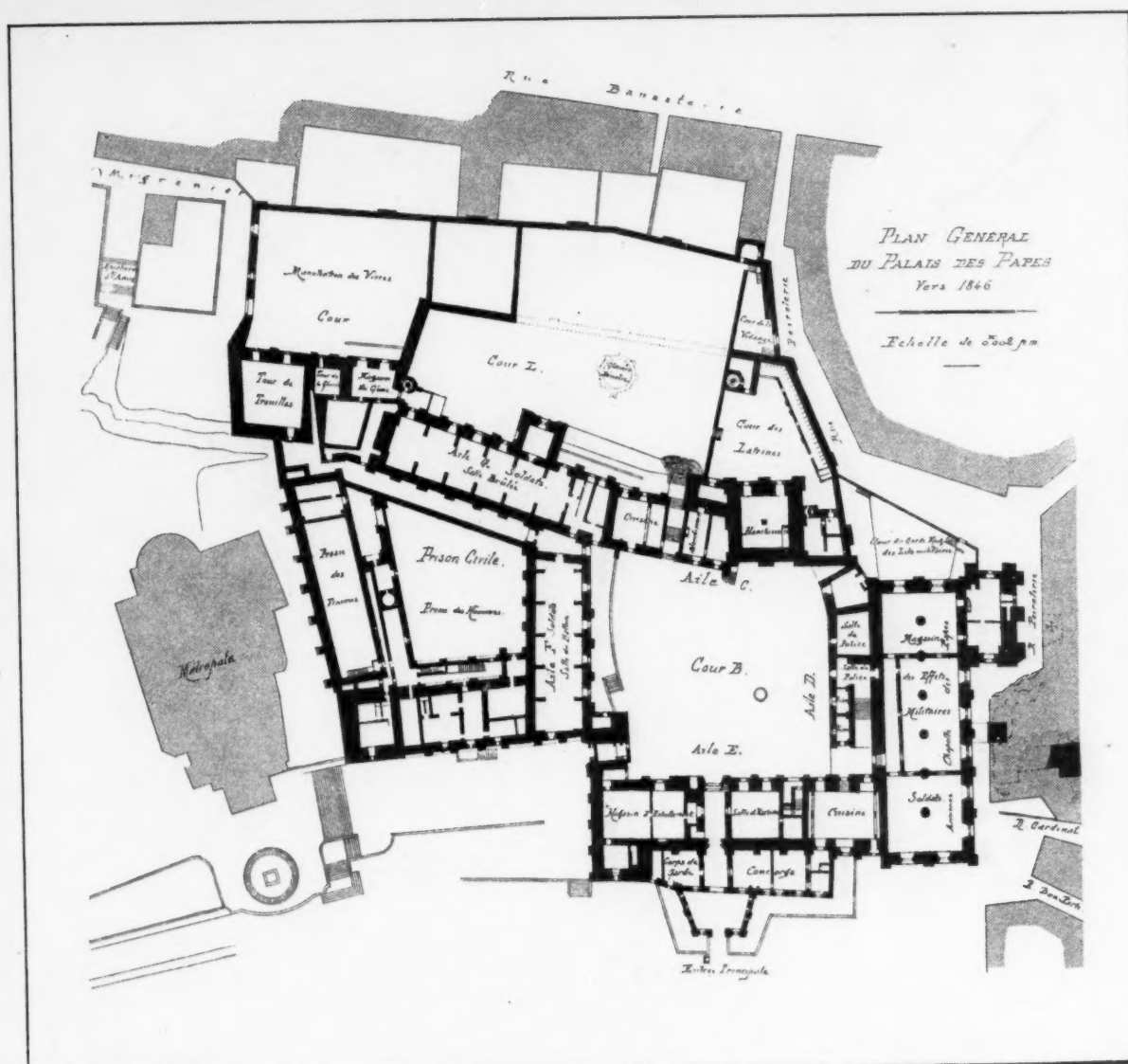


First Floor Plan

HELIOTYPE CO., BOSTON.

The American Architect
Oct. 3, 1903.
No. 1449.

COPYRIGHT, 1903, BY AM. ARCHITECT CO.



From La Construction Moderne.

PALACE OF THE POPES, AVIGNON, FRANCE.
RESTORATIONS SUGGESTED BY M. NODET.

COPYRIGHT, 1903, BY AM. ARCHITECT CO.

The American Architect
Oct. 3, 1903.
No. 1449.

THE AMERICAN ARCHITECT AND BUILDING NEWS

ADVERTISERS' TRADE SUPPLEMENT

No. 257

SATURDAY, OCTOBER 3, 1903

VOLUME LXXXII
No. 149

COATED WIRE NAILS.

THE steel cut and wire nails commonly known to-day are the products of a great industry, and their consumption is not limited to any particular class; "everyone uses nails more or less," but by far the largest consumers are those employed in building construction.

Ten years ago manufacturers made about as many wire nails as cut nails, now they make six times as many, which shows that the better nail was bound to outdo the other in popularity, as well as in superiority.

Outside of the steel cut flooring nail used in laying finished floor, it is safe to state that in building construction wire nails have taken the place of all others, and that they won on their own merits.

NAILS DRIVEN PERPENDICULAR TO THE GRAIN OF THE WOOD.—ALL NAILS DRIVEN IN THE SAME STICK.

Test No.	DESCRIPTION OF NAIL.		Diameter (ins.)	Total Length (ins.)	Length Driven (ins.)	Adhesive Resistance (Total lbs.)	Average (lbs.)
	Size and Name						
11.989	10d Common Smooth		.145	2.99	2.50	136	167
	10d " "		.145	2.99	2.50	144	
	10d " "		.145	2.99	2.50	220	
12.058	10d Coated		.117	3.00	2.50	414	418
	10d " "		.117	3.00	2.50	406	
	10d " "		.117	3.00	2.50	435	
11.991	9d Common Smooth		.132	2.83	2.25	226	182
	9d " "		.132	2.83	2.25	175	
	9d " "		.132	2.83	2.25	196	
11.992	9d Coated		.114	2.68	2.25	345	327
	9d " "		.114	2.68	2.25	318	
	9d " "		.114	2.68	2.25	317	
11.993	8d Common Smooth		.132	2.52	2.00	146	189
	8d " "		.132	2.52	2.00	228	
	8d " "		.132	2.52	2.00	192	
12.044	8d Coated		.112	2.39	2.00	322	316
	8d " "		.112	2.39	2.00	318	
	8d " "		.112	2.39	2.00	309	
11.998	6d Common Smooth		.097	2.05	1.625	100	106
	6d " "		.097	2.05	1.625	112	
	6d " "		.097	2.05	1.625	105	
12.059	6d Coated		.092	1.94	1.625	214	226
	6d " "		.092	1.94	1.625	218	
	6d " "		.092	1.94	1.625	247	

The cut flooring nail has earned its well deserved reputation; but if the wire nail is better than the cut nail for all other purposes, why should it not be better than the cut flooring nail?

Of late years the process of coating wire nails with a permanent adhesive substance, has proved beyond question that for nails of equal size they have an increased adhesive resistance of about 100 per cent greater than the uncoated wire nails for the same area of compression, and in this connection the ac-

companying table, showing report of mechanical tests made with the United States Testing Machine, at United States Arsenal, Watertown, Mass., by the Ordnance Department, U. S. A., June 30, 1902, and August 5 and 16, 1902, for the J. C. Pearson Company, of Boston, will prove of interest to our readers.

FIREPROOF CONSTRUCTION.

We have taken four steps onward towards the highest attainable excellence in the erection of buildings.

We propose to prove that the superiority of our material and methods have carried us to the front in fireproof construction, because they insure a greater degree of (1) Fireproof safety; (2) Positive and relative strength; (3) Adaptability; (4) Economy than any systems and material heretofore used.

We hope to make the following evidence of this, convincing though brief . . . and interesting though practical.

Confined air is the best non-conductor of heat that is known. The world owes this knowledge to the researches and discoveries of Benjamin Thompson, the most eminent practical scientist of his time.

Fireproof tiles are so shaped that, in the construction of walls, roofs, floors and partitions, quantities of air are confined immovably within the structures, warding off danger from fire in every direction.

Not only that, but in our tiling this principle is carried into the construction of the walls of the tile itself. Our method of manufacture produces separated cells of confined air—at close intervals throughout the tile—not pores, but cells.

The unequalled fireproof safety of our tiling and construction is proved, indisputably, in the following technical illustration of a practical test made at Minneapolis, Dec. 28, 1900, in the presence of experts and authorities.

Heat of 2,000 degrees Fahr. in temporary furnace walls of our tiling 7 inches thick failed to melt snow piled up on the outside of that wall.

As the above is rather astonishing, we append the attestations of the official inspectors present.

Would other instances increase your faith in us? We will mail you evidence originating in your own neighborhood.

In fires innumerable our tiling has vanquished the element. . . . Iron has twisted and melted, stone has crumbled, plaster and cement have become dust, where our walls have stood intact. . . . Yet with our tiling

buildings can be made really fireproof . . . and have been.

Positive and relative strength of building-material is a most important factor. It must be such as to give strength where most needed—i. e., in the lower walls and floors, together with lightness of weight where most needed—viz, in the upper part of the structure.

For thirty years our tiling has met all these requirements for fireproof safety and strength of structure.

Our "Johnson System of Construction" surpasses the "flat arch" and all other known methods, both in its positive strength and in its strength per weight.

The basis of this flooring is formed of large steel wires transversely interwoven with still larger wires placed 4 inches apart. These last run straight from bearing to bearing; the line of natural tension being in the line of the bearing strain, therefore they do not deflect.

Over and through these wires is placed the cement which supports and unites the tiles—making a complete monolith, a homogeneous structure.

The astonishing strength and tenacity of the "Johnson Construction" of tiled floors is indisputably proved in the test made at Minneapolis, Minn., in the presence of the Inspector of Buildings of that city. . . .

In this test there was distributed a weight of 733 pounds—live-load—to each superficial foot; a total of 187,680 pounds on a floor, with clean space of 16 feet between girders.

Bear in mind that this system of construction dispenses with steel beams—their weight . . . and their cost.

The floor is a clean, solid monolith structure stretching from girder to girder . . . or wall to wall.

Thus, with much less expense, we obtain a far greater strength than by any method of construction heretofore known.

The fact that it is adopted by the United States Government in such structures as the Chicago Post-office shows what a place it is taking in the architectural world—in fact, its position at the front.

Small wonder that as rapidly as its merits can be investigated our "Johnson System of Construction" is adopted, for it possesses the two elements that create an immediate and continued demand—viz, much greater strength at much less cost.

For partitions the tiling possesses another distinct advantage, its adaptability to quick

(Continued on page 3.)

"The Georgian Period"

THIS publication, which now consists of eleven Parts, contains over two hundred pages of text, illustrated by over three hundred and fifty text-cuts, and four hundred and four full-page plates, of which over 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		23	"
Mantelpieces		89	"
Pulpits		9	"
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.

Atlas PORTLAND CEMENT

The
Standard
American Brand.

Used Exclusively in the Following New York Buildings:

BROAD EXCHANGE	HANOVER BANK
ST. PAUL BUILDING	UNION CLUB
AMERICAN SURETY BUILDING	N. Y. LIFE INS. BUILDING
BANK OF COMMERCE	STANDARD OIL BUILDING
JOHNSTON and PRESBYTERIAN BUILDINGS	
AND MANY OTHERS	

Atlas Portland Cement Company

30 BROAD STREET
NEW YORK

Cathedral of St. John the Divine. New York, N. Y.

WE offer the illustrations of the competitive designs for the great Protestant Episcopal Cathedral, now building on Bloomingdale Heights, New York, submitted by the following Architects:

CARRÈRE & HASTINGS	NEW YORK, N. Y.	CRAM & WENTWORTH	BOSTON, MASS.
EDWARD P. CASEY	" " "	JOHN LYMAN FAXON	" "
HENRY M. CONGDON	" " "	PEABODY & STEARNS	" "
ROBERT W. GIBSON	" " "	* *	* *
B. G. GOODHUE	" " "	STEPHEN C. EARLE	WORCESTER, MASS.
HEINS & LAFARGE	" " "	* *	* *
HUSS & BUCK	" " "	T. P. CHANDLER, JR.	PHILADELPHIA, PA.
W. A. POTTER & R. H. ROBERTSON	" " "	COPE & STEWARDSON	" "
RENWICK, ASPINWALL & RUSSELL	" " "	* *	* *
FREDERICK C. WITHERS	" " "	W. S. FRAZER	PITTSBURGH, PA.
* *	* *	* *	* *
PARFITT BROTHERS	BROOKLYN, N. Y.	L. S. BUFFINGTON	MINNEAPOLIS, MINN.
* *	* *	* *	* *
W. HALSEY WOOD	NEWARK, N. J.	VAN BRUNT & HOWE	KANSAS CITY, MO.
* *	* *	* *	* *

In all, fifty-seven plates, 14 x 20 inches, printed on plate-paper.

PRICE, BOUND IN CLOTH, \$5.00.

American Architect and Building News Company,

211 TREMONT STREET,
BOSTON, MASS.

changing of these in office-buildings, for instance, where new tenants need a new distribution of space. Not only can such changes be made very quickly, but without marring or cutting away the walls in the least.

Our tiling and systems of construction are not the cheapest nor yet the dearest in the world, but upon the question of economy the closer they are investigated, the better for us. . . . They bear the tests of time, and if the first cost is sometimes greater than for other material and methods, this is usually covered by the lessened cost of insurance.

No risks are so eagerly sought at minimum rates.

Aside from this, the speed with which our tile is used, its durability, and its reliability under all conditions make our method and material the most economical.

An inquiry from you will receive prompt and careful attention.

No comment is needed to strengthen the following (extracts from the report of Prof. Henry E. Smith, Consulting Engineer of the

University of Minnesota), as to the fire-resisting power of our tiling and construction:—

"To make the test practical" . . . "a section of wall was constructed" and "against this was built a furnace."

"A Pyrometer was inserted near the top of the furnace and about 6 inches from the wall to be tested, and directly in the path of the flame and gases. The temperature of the outside air was 15 degrees above zero." (The wall to be tested—that shown nearest the chimney—was shielded from the "slight wind" by the furnace.)

"A layer of snow and ice, three-quarter inches thick"—in some places—covered "the top of the furnace," and snow (in thin patches where the heat was greatest) "was placed against the tile wall itself."

From 2.15 to 4.11 P. M., with "a light wood fire" . . . "the temperature" gradually "rose to 2,000 degrees Fahr.—the limit of the Pyrometer—and no doubt considerably above."

"The snow packed" . . . "against the

wall showed NO SIGNS OF MELTING," and even "the snow on the top of the furnace" (where the tiling was thinner), "had not been entirely removed at the end of the test."

"The 2-inch furring coating, or fire surface, showed about one-sixteenth inch total expansion in length, relatively to the main wall."

"After the fire" . . . "which continued for two and one-half hours" . . . "no trace of a crack or check could be found" in the wall.

The wall was 7 inches thick and 8 feet high. "At the maximum heat a solid body of flame rose 2 feet above the tile chimney."

The test was made at Minneapolis, Minn., on Dec. 28, 1900.

NATIONAL FIREPROOFING CO.,
PITTSBURGH, PA.

FIREPROOF WINDOWS.

AFTER a thorough investigation of the art of metal window manufacture and a most thorough examination of the various window frames on the market and the expenditure of a large amount of money in experimenting ourselves, we have been compelled to

ALSEN'S

AMERICAN PORTLAND CEMENT

An artificial Portland Cement of the highest character made under the supervision of Chemists and Engineers connected with the Alsen's Cement Works of Hamburg, Germany, superior to all other American Portland Cements, absolutely sound, uniform, and of great strength.

SINCLAIR & BABSON, Gen'l Agents, 45 Broadway, New York

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

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.

BOOKS:

"Monumental Staircases."

40 Gelatine Plates on bond paper, 9" x 11".
In Envelope. Price, \$5.00.

AMERICAN ARCHITECT COMPANY, Publishers.

acknowledge the superiority of the Watson Patent Fireproof Windows, which for simplicity of construction, ease of operation, fire-resisting qualities and weather-resisting properties have never been equalled; and have therefore purchased from the Watson Fireproof Window Co. their entire plant of machinery and dies which they have just installed in Cleveland, Ohio, with the intention of manufacturing there.

We secured with the machinery the exclusive right to manufacture in all the States and territories of the United States and for export, with exception only of Illinois, New Hampshire, Vermont, Maine, Rhode Island, Massachusetts and city of Greater New York, and will have the machinery installed at once in my factory in Salem and are prepared to execute all orders.

With our immense equipment of machinery and facilities for handling work of this character we feel confident that we can name to the architects and to the trade, prices that will interest them and that will force the sale of these frames.

To intending purchasers we will be glad to send full details and representative to show model and sample of frame.

We have now in preparation a very complete catalogue showing all details of the window, which will be sent to those who desire it.

W. H. MULLINS,
SALEM, OHIO.

What the Critics Say of "The Georgian Period"

"Review of Reviews"	"The most interesting of all American publications in the field of architecture."
"The Nation"	"One of the most important American works on architecture."
"Architectural Review" [London]	"This great work."
"The Builder" [London]	"Of great value."
"Building News" [London]	"Beautifully printed and well delineated."
"Irish Builder" [Dublin]	"Of superior excellence and great usefulness."
"Journal of the R. I. B. A." [London]	"We can only hope the publishers will continue the series."
"N. Y. Tribune"	"A peculiarly fascinating and instructive work."
"N. Y. Evening Post"	"Grows in interest with every succeeding number."
"Art Interchange"	"One cannot but marvel at the extent and value of the contents."
"N. Y. Times"	"Needs only to be better known in order to secure a wider audience."

Montgomery Schuyler, whose name and opinion carry weight, calls the "Georgian Period" "a fine, even a monumental, piece of work," and says that the work has been "well worth doing" and has been "admirably done."

AMERICAN ARCHITECT COMPANY, Publishers
211 Tremont Street, Boston, Mass.

THE AMERICAN ARCHITECT AND BUILDING NEWS

A WEEKLY JOURNAL OF CONSTRUCTIVE AND DECORATIVE ART

VOL. LXXXII.—No. 1449.]

SATURDAY, OCTOBER 3, 1903.

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.

51 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 in Forestry, Engineering,
Mining and Metallurgy, Architecture, Landscape
Architecture, etc. Students admitted by
examination and by transfer from other Schools
or Colleges. Approved Special Students admitted
without examinations. New and enlarged equip-
ment. For Catalogue apply to the Secretary,
J. L. LOVE, 16 University Hall, Cambridge, Mass.
N. S. SHALER, Dean.

Redding, Baird & Co.

Stained Glass

Repairing

Dept.

We make a specialty of the
Repairing of Stained Glass
Windows, both in the Church
and Home. Competent Artisans
are sent to make examination
and estimate of cost

83 Franklin St., Boston.

LOOMIS FILTERS.

ESTABLISHED 1880.

Improved System. Simple and Effective.

LOOMIS-MANNING FILTER CO.,

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

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.

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.

THE SOCIETY OF BEAUX-ARTS
ARCHITECTS

has established

A FREE COURSE OF STUDY

open to draughtsmen and students of any city modelled
on the general plan pursued at the Ecole des Beaux-Arts in Paris,
and comprising frequent problems in Orders, Design, Archeology, etc.
For information apply to the Secretary of the Committee
on Education, 3 East 33d St., New York City.

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.

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.

PHILADELPHIA, PA.

UNIVERSITY OF PENNSYLVANIA

SCHOOL OF ARCHITECTURE

FOUR-YEAR COURSE (Degree B. S. in Arch.).

GRADUATE YEAR (Degree M. S. in Arch.).

TWO-YEAR SPECIAL COURSE (Certificate).

College Graduates are granted advanced
standing and qualified draughtsmen admitted
to the Special Course.

The University offers also four-year courses
in CIVIL, MECHANICAL, ELECTRICAL AND
CHEMICAL ENGINEERING, leading to the Degrees
of B. S. in their respective subjects.

For full information address: DR. J. H.
PENNIMAN, Dean, College Hall, University
of Pennsylvania, Philadelphia, Pa.

"THE AMERICAN VIGNOLA"

THE FIVE ORDERS OF ARCHITECTURE

BY

WILLIAM R. WARE

Professor of Architecture, Columbia University

Text and Plates, 86 pp., 9"x12" Price, \$3.00

AMERICAN ARCHITECT COMPANY,
PUBLISHERS

BOOKS:

"Door and Window Grilles."

104 Plates: 10" x 14 1/2".

In Cloth, \$7.50.

In Portfolio, \$6.50.

AMERICAN ARCHITECT COMPANY, Publishers.

ROBERT C. FISHER & CO.

Successors to Fisher & Bird,

MARBLE AND GRANITE WORKS

97, 99, 101 and 103 EAST HOUSTON STREET,

Established 1830.

NEW YORK.

When You Build a Skyscraper



Don't risk its early destruction by using cheap paint on its
steel skeleton. There is one material that will perfectly
protect metal from rust—

Durable Metal Coating

Specify it and be safe.

EDWARD SMITH & COMPANY

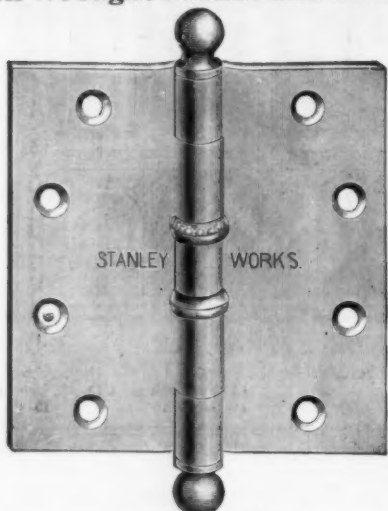
Varnish Makers and Color Grinders

45 Broadway, New York

59 Market St., Chicago

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 Beckman 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.

"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,

13 Rue Bonaparte, Paris, France.

MINERAL WOOL

FIRE, SOUND and VERMIN PROOF INSULATOR.

Samples and Circulars Free.

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

"COHESIVE CONSTRUCTION."

An Essay on the Theory and History of Cohesive Construction.

By **RAFAEL GUASTAVINO, Architect.**

Price, \$1.25.



THE NAME **"Standard"**

is cast in relief on every piece of the

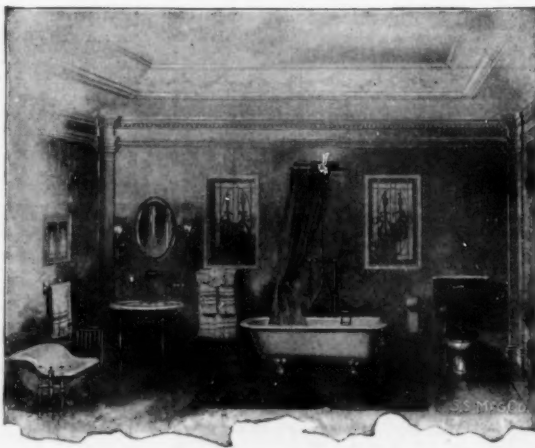
Porcelain Enameled Ware

that has received the Highest Awards at All World's Fairs and Expositions.

The guarantee which this name carries with it is absolute and a positive assurance against the annoyances inseparable from the use of inferior and non-guaranteed brands.

"Standard" Porcelain Enameled Ware has the hard, smooth and absolutely non-porous surface that is essential to perfect sanitation, combining the daintiness and purity of china with the strength and durability of iron.

Catalogue matter on request.



STANDARD SANITARY MFG. COMPANY
PITTSBURGH, PA.

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.

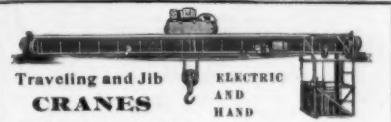
Send us post-office money order for 50 cents and we will send you the last six weeks' issues.

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

NATIONAL FIRE-PROOFING CO.

PITTSBURGH NEW YORK BOSTON
PHILADELPHIA CHICAGO

We own patents for the Johnson System of Fire-proofing. Residences and other buildings can be made fire-proof without the use of steel. Let us give you estimates.



Traveling and Jib
CRANES
ELECTRIC
AND
HAND
Send for catalog, dimensions, etc.
NORTHERN ENGINEERING WORKS
24 Chene St., Detroit, Mich.



CLEANING

whether given frequently by the careful housemaid or strenuously by the zealous janitor, does not destroy the original brightness of

BENEDICT-NICKEL SEAMLESS TUBING

It is "white metal clear through" and there is no plated surface that can be worn away by rubbing

All products including Seamless Brass and Copper Tubing are described in our "Table Book."

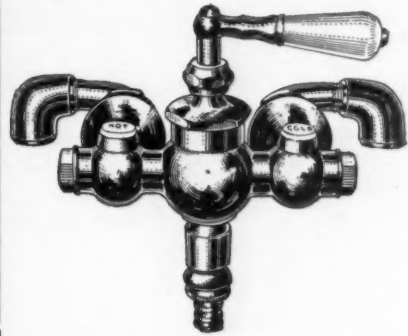
BENEDICT & BURNHAM MFG. CO.
WATERBURY, CONN.

New York
253 Broadway

Boston
172 High St.



SODERLUND BATH-TUB FIXTURE



OPERATED BY ONE HANDLE

Simplicity Itself. Economical
and Attractive

Send for Complete Catalogue

Union Brass Works Co.

7 Sherman St., Charlestown, Boston

BOOKS:

"Cathedral of St. John the Divine."

Designs submitted in the First Competition.

57 Plates, folio. Price, \$5.00.

AMERICAN ARCHITECT COMPANY.

THE COST OF PAINTING

And repainting in a term of years (say twenty) determines whether a paint is economical or expensive.

ZINC WHITE PAINTS

Cost least and wear longest, besides being the most durable, beautiful. They offer economy plus satisfaction.

FREE: Our Practical Pamphlets
"Paints in Architecture."
"Specifications for Architects."
"French Government Decrees."

The New Jersey Zinc Co.
71 Broadway
New York

Topographical Index of Advertisers.

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

CONNECTICUT.
New Britain. The Stanley Works.....[Wrought-Steel Bells]
Stamford. Yale & Towne Mfg. Co.....[Locks]
Waterbury. Benedict & Burnham Mfg. Co.....[Seamless Nickel] Seamless Tubing for Exposed Plumbing
ENGLAND.
London. Architect and Contract Reporter, The.....[Magazines] Building News, The.....[Periodical]
ILLINOIS.
Chicago. Chicago & Alton Railway.....[Railroad Crane Co.] Hagen Co., A. T.....[Laundry Machinery] Northwestern Terra-Cotta Co.....[Terra-Cotta Taylor, J. W.....[Photographs] Winslow Bros. Co., The.....[Ornamental Iron and Bronze]
IOWA.
Council Bluffs. Kimball Bros. Co.....[Elevators]
MAINE.
Rockport. Rockland-Rockport Lime Co.....[Lime]
MARYLAND.
Baltimore. Lafayette Mill and Lumber Co., The.....[Lumber] Vale & Young.....[Skylights]
MASSACHUSETTS.
Boston. Amer. Mason Safety Tread Co.....[Stair Tread] Bartlett Lumber Co.....[Lumber] Blodgett Clock Co.....[Clocks] Broad Gauge Iron Stail & Vane Works.....[Stable Fixtures] Butcher Polish Co.....[Floor Polish] Cabot, Samuel.....[Deafening Quilt] Cairns, Hugh.....[Stone Carving and Modelling] Campbell, Walter M.....[Perspective] Carlisle, Pope & Co., E. A.....[Lenses, Windows, Etc.] Columbian Marble Quarrying Co.....[Marble Dealers] Couch Co., S. H.....[Telephones] Craig, David.....[Crem-o-tail] Crawley & Son, George E.....[Tiles and Fire-plates] Dadman, Leon E.....[Photography (Architectural and Commercial)] Elston & Co., A. A.....[Buildings Turn Down

MASSACHUSETTS.
Boston. Erickson Electric Equipment Co.....[Electrical Contractors] Folsom Snow Guard Co.....[Snow Guards] Fowler, Herbert.....[Ornamental Plastering] Gallagher & Munro Co.....[Plasterers] Gurney Hester Mfg. Co.....[Hot-water, etc.] Heliotype Printing Co.....[Art Printing] Howard Clock Co., The E.....[Clocks] Jager Co., Charles J.....[Engineers] Johnson & Co., H. A.....[Portable Ovens] Ladder, G. G.....[Drawing Instruments] Makepeace, B. L.....[Blue Prints] Marble Co., W. F.....[Brass Finishers] Massachusetts Institute of Technology.....[School Means & Thacher.....[Paints] McKay & Woolner.....[Contractors and Builders] Morrill & Whiton Construction Co.....[Masons and Builders] Morris & Whyte.....[Artistic Wire & Metal Works] Olive, E. Percy.....[Photography] Parks & Jester.....[Blue Printing] Pearson Co., J. C.....[Wire Nails] Perry, W. J.....[Dumb-water] Redding, Baird & Co.....[Stained Glass] Robey-French Co.....[Photographic Supplies] Ryan, William Curtis.....[Insurance] Samson Cordage Works.....[Sash-Cord] Sleep, Elliot & King Co.....[Modelling and Ornamental Plaster] Smith & Anthony Co.....[Ras-ges and Heaters] Spaulding Print Paper Co.....[Blue Prints] Standard Fire-escape & Mfg. Co.....[Fire-escapes] Stebbins, N. L.....[Photography (Architectural and Commercial)] Sturtevant Co., E. F.....[Fan System] Union Brass Works Co.....[Bath-tub Fixtures] Van Noorden Co., E.....[Skylights, Metal Whistler Machine Co.....[Elevators]
CAMBRIDGE.
Goodhue, Harry Eldredge.....[Memorial Windows]
CLINTON.
Clinton Wire Cloth Co.....[Metallic Lathing]
PAIMER.
Pymt Building & Construction Co.....[Building Contractors]
SOUTH BOSTON.
Boston Flag Pole Co.....[Flag Poles]
MICHIGAN.
Detroit. Berry Brothers, Limited.....[Shingles] Northern Engineering Works.....[Cranes]
MISSOURI.
St. Louis. Washington University School of Engineering and Architecture.....[Subsoil]

NEW JERSEY.
Jersey City. Dixon Crucible Co., Jos.....[Graphite]
Paterson. Passaic Steel Co.....[Structural Iron]
Perth Amboy. Perth Amboy Terra-Cotta Co.....[Terra-Cotta]
NEW YORK.
Irvington-on-Hudson. Lord & Burnham Co.....[Conservatories]
Ithaca. Cornell University.....[School]
Jamestown. Art Metal Construction Co.....[Art Metal Work]
Long Island City. Richey, Browne & Donald.....[Ornamental Iron and Bronze]
N. Y. City.
Alsen's Cement Works.....[Cements] American Tin Plate Co.....[Roofing Tin] Associated Expanded Metal Co.....[Expanded Metal] Atlas Cement Co.....[Cement] Brown Hoisting Machine Co., The.....[Fireproofing] Deane, E. Eldon.....[Colorists] Elevator Supply and Repair Co.....[Electric Signals] Fisher & Co., Robert C.....[Marble Reflectors] Hayes, George.....[Metallic Lathing] Harrow Telephone Co.....[Elevator Signals] Hittches & Co.....[Greenhouses] Jackson & Co., Wm. H.....[Grates] Jenkins Bros.....[Valves] Jones, T. W.....[Rugs (Carpets)] Kent-Costick.....[From Work] Neuchatel Asphalt Co.....[Asphalt] New Jersey Zinc Co., Ltd.....[Fine White New York Belting and Packing Co., Ltd.....[Interlocking Rubber Tiling] N. Y. Metal Ceiling Co.....[Metal Ceilings] Okonite Co. (Ltd.).....[Insulated Wire] Pitt, W. R.....[Folding Gates] Quimby, W. E. (Inc.).....[Electric Pumps] Rider-Erickson Engine Co.....[Hot-Air Engines] Sargent & Co.....[Builders Hardware]

NEW YORK.
N. Y. City. Smith Co., H. B.....[Steam Heat] Smith & Co., Edward.....[Furnaces] Society of Beaux-Arts Architects, The.....[School U. S. Mineral Wool Co.....[Mineral Wool] Van Kannel Revolving Door Co.....[Revolving Doors] Warren Chemical & Mfg. Co.....[Asphalt Roofing] Williams, John.....[Wrought Metal] Yale & Towne.....[Hardware (Art)
ROCHESTER.
Cutler Mfg. Co.....[Mail Chutes]
Troy. Globe Ventilator Co.....[Ventilators] Troy Laundry Machinery Co.....[Washing Machines]
OHIO.
Canton. Berger Mfg. Co., The.....[Metal Ceiling]
Cleveland. Tyler Co., The W. S.....[Ornamental Iron and Bronze]
Columbus. Kinnear & Gager Co., The.....[Metal Ceiling] Kinnear Mfg. Co., The.....[Steel Rolling-doors] Nelson Co., The C. T.....[Capitals (Carved)] Ohio State University.....[Schools]
Marietta. Introstile and Novelty Co.....[Introistles]
Salon. Mullins, W. H.....[Architectural Metalwork]
West Cleveland. Cudell, F. E.....[Traps]
PENNSYLVANIA.
Philadelphia. French & Co., Samuel H.....[Marble Colors] Loomis Filters Improved System.....[Filters] Merritt & Co.....[Lockers (Expanded Metal)] Merchant & Co., Inc.....[Roofing Plates] Morse, Williams & Co.....[Elevators] Taylor Co., N. & G.....[Roofing Tin] Thorn, J. S. Co.....[Sheet Metal] University of Pennsylvania.....[School]
PITTSBURGH.
National Fireproofing Co.....[Fireproofing] Standard Sanitary Mfg. Co.....[Porcelains] Enamelled Ware.....[Enamelled Ware]
RHODE ISLAND.
Providence. Natta-Brook Machine Co.....[L. Ck-r]



The Kinnear Stamped Steel Ceiling, Sidewall

etc., has held its place in the front for years. It has no equal in **construction** or **design**.

Catalogue and prices furnished upon request.

The Kinnear & Gager Co.
Manufacturers
(New Plant) 236 Mt. Vernon Ave.
Columbus, Ohio
Eastern Warehouse and Office
No. 125 Broad St., Boston



CORRECT TIME

Fine Self-Winding Clocks for Office Buildings, Residences, Libraries, Churches, Etc.

Self-Winding Tower Clocks. No heavy weights. No stopping by storms.

Program Clocks and Time Systems for Schools, Public Buildings, Etc.

20,000 in Use

Write for Catalog

Blodgett Clock Co., 141 Franklin St., Boston

LOCKERS

SEND FOR CATALOG
NARRAGANSETT MACH. CO.
BOX 24, PROVIDENCE, R. I.

STEEL OR WOOD

[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 Company
211 Tremont St., Boston

CODE OF PRACTICE FOR SUB-ESTIMATING AND SUB-CONTRACTING

Adopted by the Master Builders' Association of the City of Boston, Aug. 2, 1894.

ARTICLE I.

Obligation of Principal Contractor to Sub-Contractor.

A principal contractor is under obligation to treat upon an equal basis all estimates which he "receives" prior to putting in his own bid. Estimates must be considered as "received" when they come into a principal contractor's possession, either by his direct solicitation or by being accepted by him. The opening of a bid, knowing it to be such, constitutes receipt of the same.

A principal contractor is under no obligation to use a bid which he has not solicited, accepted, or received, but if he does not wish to use the estimate of a sub-bidder he should decline it, if proffered personally, or should return it unopened if sent to him by mail or otherwise. The retention of a bid should be construed as a receipt of the same.

A principal contractor, when making up his estimate, is not entitled to receive bids from sub-contractors if he is at the same time making himself their competitor by figuring their portion of the contemplated work. It is legitimate for a principal contractor to figure all portions of work, depending upon no one for what are usually known as sub-estimates, but it is not legitimate for him to receive bids from others for sub-work if he is himself figuring those portions independently.

ARTICLE II.

Award of Sub-Contracts.

The principal contractor having been awarded a general contract should immediately award the sub-contracts to the lowest bidder in each branch.

ARTICLE III.

Penalty for not Awarding Contract to Lowest Sub-Bidder.

A principal contractor failing to award a sub-contract to the lowest sub-bidder to whom he is under obligation as previously provided should be liable to pay damages to the said lowest bidder, in amount not less than ten per cent of the amount of the estimate.

Payment of such damages will not relieve the principal contractor from liability to discipline under provisions of Article X of the By-Laws of this Association.

ARTICLE V.

Payments to Sub-Contractors.

Unless the contracts made with sub-contractors otherwise provide, payments during the progress of the work should be made by the principal contractor to the sub-contractors upon the same basis of payment, in relation to amount of work performed, as is prescribed in the contract made by the principal contractor with the owner.

Final payment to a sub-contractor should be considered as due at the expiration of thirty days after the completion of his work and its approval by the architect or owner, unless otherwise provided by the sub-contract or agreement.

ARTICLE VII.

Obligation of Sub-Contractor to Principal Contractor.

Should a sub-contractor refuse to contract at the amount of the estimate he has given to a principal contractor who has used the said estimate in good faith, he then should be liable to the said principal contractor for damages in amount not less than the difference between the amount of the estimate which was submitted by him and the amount at which the principal contractor may be obliged to contract the work.

Payment of such damages will not relieve the sub-contractor from liability to discipline under provisions of Article X of the By-Laws of this Association.

ARTICLE X.

Bids to Architects or Owners.

When bids for separate departments of work on a building are solicited by the architect or the owner, they should be submitted with the understanding that they are direct estimates, for which direct contracts are to be made by the owner with the lowest bidder, and no other disposition of such bids should be permitted without consent of the bidder submitting the same.

Sub-bids should be given only to the principal contractors who are estimating the work in question, and should not be left with architects or owners for the inspection and information of principal contractors. Sub-contractors must understand that bids thus left with architects or owners are in great danger of losing their confidential character, and that if they so leave them they cannot claim protection or redress under the first article of this Code.

SUGGESTIONS.

Members of this Association having sub-contracts to let, or material to buy, should, as far as may be consistent with business principles, deal only with members of the Association, or at all events give their fellow-members an opportunity to compete, and then give them the preference, other things being equal.

All bidders should take cognizance of the danger they may be subjected to through the practice, so prevalent in some architects' offices, of making change in plans or specifications, or in both, during the progress of estimating. Correction of this pernicious practice can only be obtained through refusal by contractors to estimate under such conditions.

A true copy.

Attest:

WM. H. SAYWARD,
Secretary, M. B. A.



CEMENT COATED NAILS WERE USED IN LAYING THE FLOORS OF THE WALDORF ASTORIA

Cement Coated Wire Nails

are superior for building purposes to either cut or ordinary wire nails, having the advantages of both and distinctive qualities of their own. Tests made by the U. S. Army at Watertown, Mass., and by our customers, have shown them to have a holding power at least 100 per cent. greater than that of uncoated wire nails. They are carefully made and closely inspected, the list including every size and style required for a building of any description.

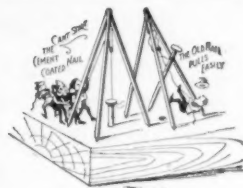
For Flooring

they have very apparent advantages over either cut or wire nails. They will not split the wood, and their unyielding grip "draws down" in a manner that for all time prevents springing. They cost you less. We invite your correspondence.

J. C. PEARSON COMPANY

Board of Trade Building

BOSTON, MASS.



"MINOR FOUNTAINS,"

Being No. 3 of a Series of "Architectural Odds and Ends,"
40 GELATINE PRINTS - - \$5.00 PER COPY.
AMERICAN ARCHITECT CO.



Iron Stairs in the N. E. Conservatory of Music Building
Boston, Mass.

Iron Stairs
Store Fronts
Balconies
Grilles
Railings
Elevator Cars
Elevator Enclosures
and
Ornamental Iron
Work for Buildings

Ornamental Iron Work in the above Building Furnished by

THE W. S. TYLER COMPANY

CLEVELAND, OHIO

[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

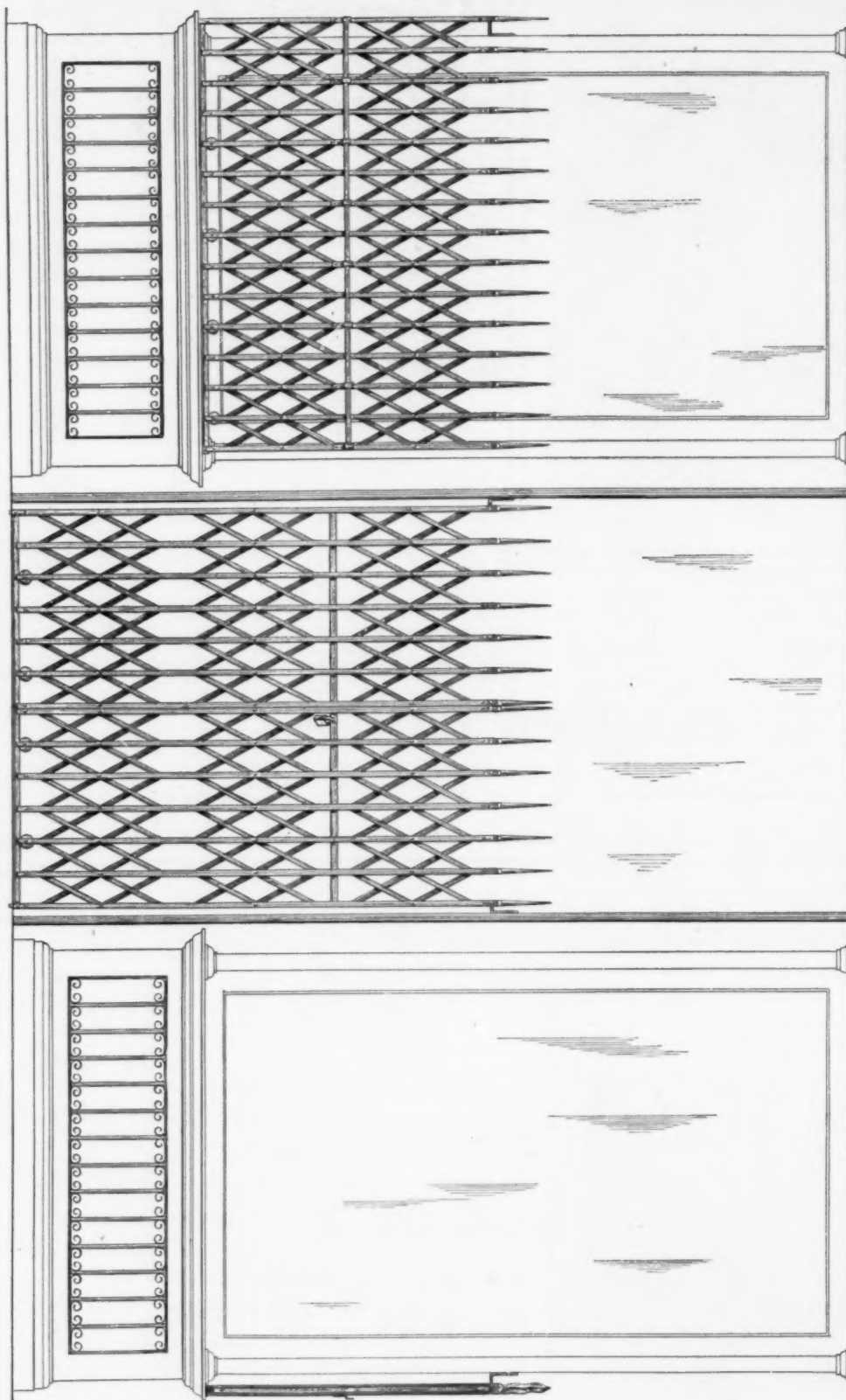
The next time you pass along the streets of one of our large cities, note what rapid progress is making in the use of wrought-metal grilles, screens and gates of various kinds for the ornamental protection of doorways and the window-openings of lower stories.

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 Company.
211 Tremont Street, Boston

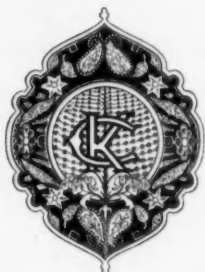
PITT-BOSWICK FOLDING GATES FOR SHOW WINDOWS AND STORE ENTRANCE



MANUFACTURERS OF THE "PITT," "BOSWICK," NOVELTY AND COMPOSITE PATENT FOLDING GATES AND GUARDS, IN BRASS, BRONZE, STEEL OR IRON, FOR STORE FRONTS, VESTIBULES, ELEVATOR ENCLOSURES AND CARS, BANK VAULTS, WINDOWS, BRIDGES, FERRYBOATS, CARS, ETC. ALSO ARCHITECTURAL AND ORNAMENTAL IRON, BRASS AND BRONZE WORK FOR BUILDINGS, RAILINGS, DRIVEWAY AND ENTRANCE GATES, WINDOW GRILLES, MARQUEES, BANK AND OFFICE GRILLE WORK, STAIRS, LANTERNS, SPECIAL HARDWARE, AND ALL ARTISTIC WROUGHT WORK. ESTIMATES FURNISHED.

THE WM. R. PITT COMPOSITE IRON WORKS

Constable Building, 111 Fifth Ave., New York



KENT-COSTIKYAN

MAKERS AND IMPORTERS

FINE PERSIAN RUGS AND CARPETS

WHOLESALE

890 BROADWAY, COR. 19TH STREET, NEW YORKTELEPHONES 317 18TH STREET

An Invitation

Architects, Decorators and their clients are requested to visit our new show rooms which now embody 20,000 square feet of floor space and contain a most valuable and notable collection of rare antique and modern rugs and carpets, which new arrangements enable us to show under strong north light.

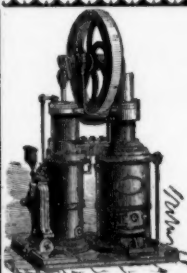
Recent improvements in our equipment include a new Antique Room in which will be exhibited Mr. Costikyan's valuable collection of Oriental art objects.

New importations of rugs from our resident buyers in Persia are constantly arriving, adding artistic and historical interest to our display and offering splendid advantages to all who seek to work out schemes of decorative treatment.



THERE is nothing in which there is such a great difference between the good and bad kinds as there is in pencils. When they are bad they are so very bad, and when they are good they are so very satisfactory, that everyone who buys a Dixon pencil appreciates it. Ask for booklet 14-j.

JOSEPH DIXON CRUCIBLE CO., JERSEY CITY, N. J.



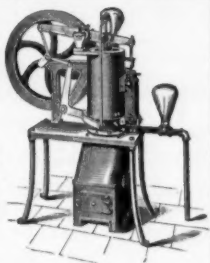
.. WATER .. RIDER & ERICSSON HOT-AIR PUMPING ENGINES

If water is required for household use, lawns, flower beds or stable, no pump in the world will pump it so safely, cheaply and reliably. No danger, as from steam. No complication, as in gasoline engines. No uncertainty, as in windmills. Prices reduced. Catalogue "B" on application.

RIDER-ERICSSON ENGINE CO.

35 Warren Street, New York
239 Franklin Street, Boston
692 Craig Street, Montreal, P. Q.

401 Dearborn Street, Chicago
40 North 7th St., Philadelphia
Teniente-Rey 71, Havana, Cuba



TRADE MARK **Everlastins** MARK
READY MIXED RED PAINT
Guaranteed the cheapest, most durable and absolutely the best for Buildings, Structures and all work that needs paint.
MEANS & THACHER, 6-8 CUSTOM HOUSE ST., BOSTON
Sole Manufacturers. Sample and prices on request

QUICK AND EASY RISING HAND POWER,
BELT POWER AND ELECTRIC

ELEVATORS

SEND FOR CATALOGUE

KIMBALL BROS. CO., 1014 9th St.,
Council Bluffs, Iowa.
KIMBALL ELEVATOR CO., 141 Vine St.,
Cleveland, O.
New York Office, 120 Cedar St.

Mason Safety Treads For STAIRS, WOOD, IRON, MARBLE
or CEMENT, new or old
Hundreds of thousands in use
Am. Mason Safety Tread Co., Boston

FOLSOM NEW MODEL SNOW GUARD

Specified by leading architects to hold the snow on all pitch roofs, entirely obviating all chance of injury to life or to the property it protects. The only perfect device for this purpose. For old and new roofs, slate, shingle, tile or metal.

THREE HISTORIC BUILDINGS

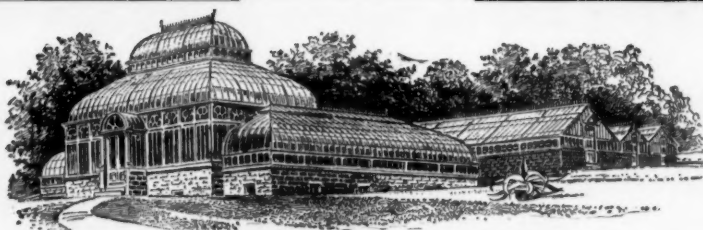
Faneuil Hall
Old South Church
King's Chapel

Boston

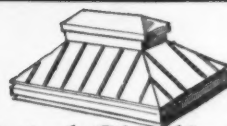
Are Fitted with this Snow Guard

FOLSOM SNOW GUARD CO.
143 Federal Street BOSTON, Mass.

ESTABLISHED 1868
THE "HAYES"
METALLIC GLAZED STRUCTURES
SKYLIGHTS FIRE PROOF WIRE-GLASS **WINDOWS**
71-8TH AVE. NEW YORK.
METAL LATHINGS ETC.



Horticultural Designers and Builders
PERFECT SASH-OPERATING APPARATUS
FOR FACTORIES, MILLS, GREENHOUSES, ETC.
HOT WATER BOILERS FOR GREENHOUSES & DWELLINGS
HITCHINGS & CO. 233 Mercer St. Send Four Cents
New York for Catalogue



Metal Skylights

that positively will not leak, drip, sweat or burn; self-ventilating. All about them in our Illustrated Catalogue—free for the asking. Shall we mail it to you?

E. VAN NOORDEN CO.

944 Massachusetts Avenue
BOSTON, MASS.



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
HIGHEST AWARD 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

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,
265 BROADWAY - - - NEW YORK.



TELEPHONE - 46-15th ST.,

NEW YORK METAL CEILING CO.
537-539-541 WEST 24th ST. N.Y.

Boston Office: 48 Congress St., Room 24.

Cabot's Creosote Shingle Stains

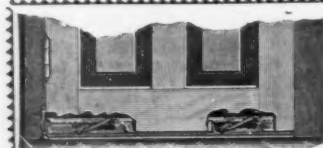
Samples and full information
sent on request



H. C. Pelton, Architect, New York.

The
Standard
For
Twenty
Years

SAMUEL CABOT, Sole Mfr.
Boston, Mass.



Thresholds not Necessary

where The Introstile is used. The Introstile is better
than a threshold and lasts longer. Difference in cost, a
trifle.

Send for circular.

The Introstile & Novelty Co.
Marietta, Ohio.

Conservatories, Greenhouses, Vineries, Etc.

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

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

E. ELDON DEANE,

Architectural Colorist and Draughtsman.
63 Seymour Building, Fifth Ave., cor. 42d St.
NEW YORK CITY.

BOOKS:

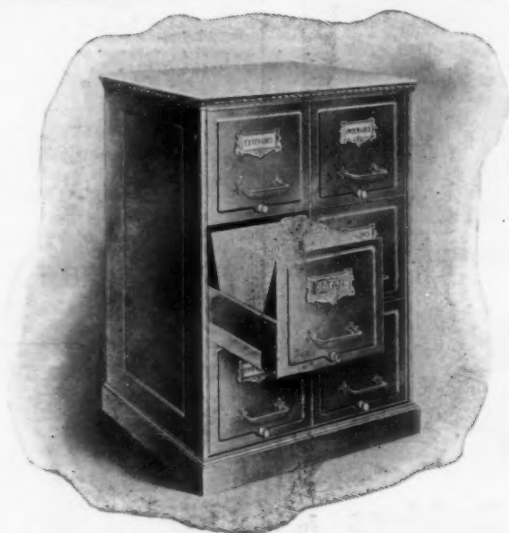
"Italian Renaissance Doorways."

104 Plates: 10" x 14½".

In Cloth, \$7.50.

In Portfolio, \$6.50.

AMERICAN ARCHITECT COMPANY, Publishers.



STEEL FILES FOR ARCHITECTURAL PLATES

Incombustible, convenient, durable and finished.
Send for Booklet 542, illustrating new styles.

ART METAL CONSTRUCTION CO.

154 Gifford Ave., Jamestown, N. Y.

BURDITT & WILLIAMS CO.

INVITE ATTENTION TO THE

FINE HARDWARE

On Exhibition in their

New and Spacious Hardware Store

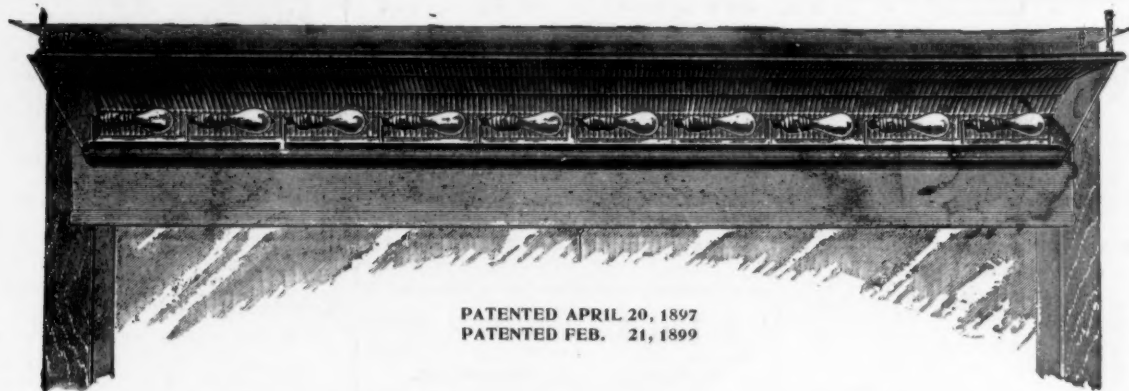
4 High, cor. Summer St., Boston

Unique Reception and Sample Room
for the use of Architects and their
clients.

Every Architect is Interested

in the problem of the perfect lighting of the modern show-window. It should be well lighted, if at all. Not a single objection can be raised against

Frink's Special Patent Window Reflector



PATENTED APRIL 20, 1897
PATENTED FEB. 21, 1899

THE BEST STORES USE IT

HIGHEST AWARDS EVERYWHERE

Floods the window with a brilliant, even light, no dazzling glare in the eyes to obscure the vision. Permits the display to be seen to best possible advantage.

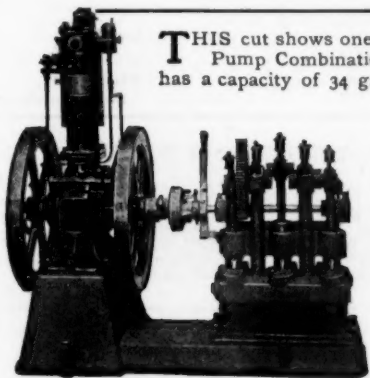
INVESTIGATION MEANS SPECIFICATION

Send for particulars on up-to-date store lighting, including our specialties in show-case lighting, and our unequalled sectional glass cluster reflectors for interior lighting. Effective, economical, durable

I. P. FRINK, 551 Pearl Street, NEW YORK

Telephone, 860 Franklin

GEO. FRINK SPENCER, Manager



THIS cut shows one of our smaller Gasolene Engine and Triplex Pump Combinations. The Engine is of 3 Hp. and the outfit has a capacity of 34 gallons a minute discharged at 146' elevation.

We are consulting and contracting engineers for Complete Water Works Systems, using Windmills, Gasolene Engines, and Electric or Steam Pumps, and are prepared to give advice to anyone on proposed plants and to submit proposals and estimates for the whole or any part of same. Send for our special catalogue on this subject.

CHARLES J. JAGER COMPANY
174 HIGH ST., BOSTON

Builders' Insurance

FIRE LIABILITY BOND

Broadest Forms. Lowest Rates

WILLIAM CURTIS RYAN

18 Central Street, Boston

Telephone, 4558 Main

I Can Sell Your Building Business

if well established, no matter where it is or what it is worth. Send description, state price, and learn how. I can also sell improved residence and business real estate in any part of the country. Write to-day.
W. M. OSTRANDER, 117 North American Bldg., Phila.

The day has passed when ventilation was regarded as a luxury. To-day it is recognized as a necessity to the maintenance of health and mental activity. Improvement in methods has been largely the result of employing positive means—the fan blower—to produce positive results.

With the **Sturtevant or Blower System**, the air is put where it is wanted, not merely allowed to go; it is heated by coils massed at a central point, without danger of leakage or freezing, and the temperature is automatically controlled.

B. F. STURTEVANT CO., BOSTON, MASS.

NEW YORK

PHILADELPHIA

CHICAGO

LONDON

The American Architect and Building News

IS PUBLISHED EVERY SATURDAY BY THE

AMERICAN ARCHITECT CO.,

211 TREMONT ST., BOSTON, MASS.

Advance Subscription Rates:

Regular Edition, \$6.00 per year; six months, \$3.50

[Foreign Postage, \$2.00 Extra.]

International Edition, per year in advance 16.00
" " quarterly 18.00

ALSO PUBLISHERS OF

Topical Architecture

(Monthly)

Subscription \$3 per year

Payment should be made to American Architect Co. direct, either by draft or post-office order.

Address all business correspondence to the publishers direct.

Advertising Agents:

New York City:—

H. M. Carleton, Temple Court, 5 Beekman St.

Agents at Large:—

M. F. Dyer, 211 Tremont St., Boston, Mass.

F. P. Spokesfield, 211 Tremont St., Boston, Mass.

Advertising Rates: For "wants" and "proposals," 15 cents per line (8 words to the line), each insertion. 50 cents the least charge. Other rates on application.

New Advertisements.

SMITH & ANTHONY CO. (Boston, Mass.), Ranges and Heaters. Page xi.

W. M. OSTRANDER (Philadelphia, Pa.) Page ix.

WILLIAM C. JANSEN (Cleveland, O.), Catalogues Wanted. Page x.

See last or next issue for the following advertisements:—

American Tin Plate Company.
Bartlett Lumber Co.
Butcher Polish Co.
David Craig.
H. B. Smith Co.
Merchant & Co., Inc.
N. & G. Taylor Co.
New York Belting & Packing Co.
Okonite Co.
Rockland-Rockport Lime Co.
Sargent & Company.
Spaulding Print Paper Co.
Samson Cordage Works.
T. W. Jones.

Catalogues Wanted

WILLIAM C. JANSEN

ARCHITECT

Room 407
262 PROSPECT STREET CLEVELAND, O.

FOR SALE.

BUSINESS CHANCES.—Granite business for sale in Lowell, Mass., and granite quarries at Madison, near Conway, N. H., by Lewis D. Gumb, Lowell, Mass. 1449

WANTED.

POSITION.—Practising Western architect now studying in New York wants a position with a New York architect. Experience more than salary an object. Address "Western," care American Architect. 1449

WANTED.

POSITION.—An experienced architect, good technical education, good designer, having done fine work, able to give a long list of references of work executed, would like a position. Take charge of an office or find a good outside man he can guarantee to back up with excellent work. "Frenchman," care American Architect. 1452

BUILDING INTELLIGENCE.

(Reported for the American Architect and Building News.)

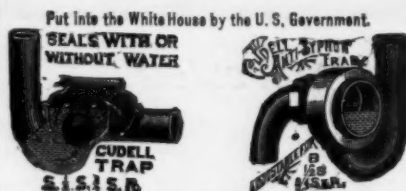
[Although a large portion of the building intelligence is provided by their regular correspondents, the editors greatly desire to receive voluntary information, especially from the smaller and outlying towns.]

ADVANCE RUMORS.

Abbeyville, S. C.—A. W. Smith, of Woodruff, proposes organizing a company to build a cotton-factory at this place or some other near-by town. The business men intend to formulate plans for subscribing to the stock and inducing Mr. Smith to carry out his contemplated plans and locate here.

Atlanta, Ga.—A site has been purchased at Glenn St. and Central Ave. for a new engine-house.

Plans for the new union station here have been completed and it is estimated that the new building will cost \$325,000. It will be used by all roads entering this city except the Nashville, Chatta-



For venting, use vent-top. For venting, use vented outlet.
F. E. CUPELL'S
PATENT SEWER-GAS AND BACK-WATER TRAP,
For Wash-Bowls, Sinks, Bath and Wash-Tub.
West Cleveland, O.

W. P. Marble & Co. BRASS FINISHERS

15 Chardon St., Boston

Telephone Connection

Estimates furnished for all lines of Brass Work.

J. W. TAYLOR'S PHOTOGRAPH SERIES OF AMERICAN ARCHITECTURE

324 Dearborn Street, CHICAGO, ILL.

THE J. L. MOTT IRON WORKS

88 Beekman St., New York, N. Y.

The Tucker Improved Grease Trap

For use in Residences, Hotels, Clubs, etc.

Circulars may be had on application.



Copyright, 1902, by The J. L. Mott Iron Works.

BRANCHES

110 Fifth Ave., New York 811 Locust St., St. Louis
378 Boylston St., Boston Flood Bldg., San Francisco
1128 Walnut St., Philadelphia 135 Adams St., Chicago

PERSPECTIVES RENDERED

IN PEN-AND-INK AND WATER-COLOR,

WALTER M. CAMPBELL,

8 Beacon St., Boston, Mass.



Soft, rich color effects are produced on shingles by the use of Shingletint. There are many brands of shingle stains in the market, but only one SHINGLETINT, which means much to the consumer, who may safely buy it and know he is getting the best shingle stain made.

Shingletint is a scientific combination of linseed oil, coloring matter, creosote, and the necessary drying agents; its use not only beautifies but prolongs the life of the shingles.

Finished woods and descriptive literature sent free upon request.

BERRY BROTHERS, Limited

Varnish Manufacturers

New York
Boston
Philadelphia
Baltimore

Factory and Main Office
DETROIT

Chicago
Cincinnati
St. Louis
San Francisco

CRANE FITTINGS

ESTABLISHED 1855

Specification Reminder for the use of Architects, Builders and Others.

A complete summary of items of every branch of building work. A very useful book for those who have to do with the erection and construction of buildings. Price, 50 cents per copy. Apply to

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

BUILDING INTELLIGENCE.

(Advance Rumors Continued.)

nooga & St. Louis. This road leases the Western & Atlantic, belonging to the State of Georgia, and will continue to use the old State property, which is at present used by all the roads.

Baltimore, Md.—Improvements will be made to the fire protection of the city: Purchase of a lot and organizing and equipping engine company No. 26 in vicinity of Guilford Ave. and Preston St., \$37,300 appropriated; purchase of a lot in vicinity of Garrison Ave. and Liberty Road and erecting truck-house, to be occupied by chemical companies Nos. 2 and 3, to be known as hook-and-ladder company No. 12, appropriation \$17,000; purchase of a lot in vicinity of Pratt and Calhoun Sts. for a truck-house, and organizing and equipping company as hook-and-ladder company No. 13, appropriation \$38,840; purchase of lot in vicinity of Alequith and Oliver Sts. for erection of truck-house, appropriation \$25,000.

At the meeting of the Sovereign Grand Lodge of Odd Fellows, the Committee on Finance reported favorably on the plan to erect a \$1,000,000 memorial temple in this city.

BUILDING INTELLIGENCE.

(Advance Rumors Continued.)

Banger, Me.—The Main Central will build a new union passenger station here. The architect of the road will begin work at once on plans for a structure to cost about \$300,000, which will be built next year.

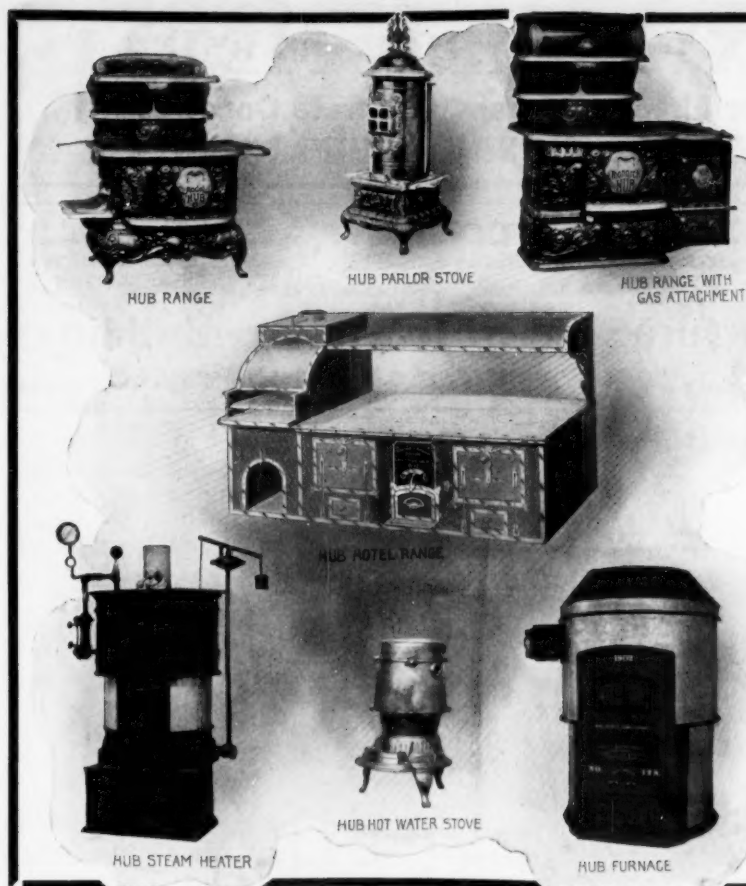
Bath, Me.—The Columbia Shoe Polish Co. has purchased the old Loach homestead at the corner of School and Washington Sts., where it will erect a large factory.

Bemidji, Minn.—It is reported that Fred Eberleau will establish a \$45,000 brewery here.

A five-story cedar-log hotel building, costing \$50,000, is to be erected by P. H. McGarry after plans by Kinney & Detweiler, of Minneapolis.

Bridgeport, Conn.—The American Graphophone Co. is taking estimates for two large additions to its plant.

Plans have been drawn for two more buildings for the Eaton, Cole & Burnham Co. They will cost \$150,000 and will be built by the Berlin Construction Co. One building will be 80' x 330', two stories, and the other 80' x 165', two stories. Both will be



Smith & Anthony Co.

Manufacturers of

HUB

RANGES
AND HEATERS

Hotel and Restaurant
Specialties

and

Sanitas Plumbing
Specialties

HUB Goods have every tested
modern improvement and
are the most popular make

Write for further information and Cata-
logue Z.

48-54 UNION STREET, BOSTON

BUILDING INTELLIGENCE.

(Advance Rumors Continued.)

of brick and steel. An extensive sewer system, for the entire plant, has been decided upon, and plans have been drawn for it. The work now planned by the company involves an expenditure of over \$500,000.

Cartersville, Ga.—Work on the plant of the Mc-Lain Mfg. Co. is now progressing steadily. The main building—a three-story, 130' x 230' structure—is to be completed soon and the equipment of machinery will then be put in position. About 100 cottages, with modern conveniences, will be erected to accommodate the operatives. A well-regulated mill town will thus be developed, with improved streets, lighting facilities, etc. This enterprise will represent the investment of \$500,000 when it is ready for operations.

Charleston, S. C.—This city is to have a public art museum to be called the Gibbs Art Institute. It will be located on the site of the old Grand Opera House, will be built of granite, and will cost \$100,000.

Chicago, Ill.—Announcement is made that Otto Young has leased the St. Mary's block, at the corner of Wabash Ave. and Madison St., from the Catholic bishop of Chicago. Mr. Young will improve the property with a \$1,000,000 "sky-scraper," the lower floors of which will be used for mercantile purposes and the upper for offices.

The University of Chicago has purchased the entire south frontage of the Midway Plaisance between Cottage Grove and Madison Aves., at a cost of \$1,000,000 for the land and \$450,000 for the buildings. This confirms the reports that the largest medical school in the world is to be established on the Midway. Rush Medical College will form the nucleus of the institution, and it will be supplemented by the McCormick Memorial Institute for infectious diseases.

Cleveland, O.—Plans for a mammoth cold-storage warehouse which will give this city the finest and largest plant of this kind in Ohio have been announced. The Broadway Warehouse Co. is back of the enterprise. M. W. Kingsley is president, A. W. Armour, vice-president, and R. K. Pelton, secretary and treasurer of the concern. According to estimates, the building will cost approximately \$500,000. A site on Broadway near the Nickel Plate depot has been secured.

Clinton, Mass.—It is announced that Frank T. Holder, of Yonkers, N. Y., will give to the Clinton Historical Society land and erect thereon a building suitable for a natural history museum and for art and historical collections. He has purchased the Dr. George M. Burdett estate on Church St. for this purpose. This land adjoins that of the Public Library of the town, and the building to be erected will be of brick with stone trimmings, of a size approaching that of the library building.

Columbus, O.—The Memorial Hall trustees met recently with their architect, Mr. Frank Packard, at his office, and further considered plans and specifications for the proposed building.

Council Bluffs, Ia.—Patton & Miller have plans in preparation for a \$70,000 library building.

Fert Dodge, Ia.—A modern fireproof hotel will be erected by Harry Tremaine. Cost, \$165,000.

Helena, Mont.—Hans Hansen secured the carpentry and Lewis M. Hansen the masonry in the erection of the auditorium for the First Presbyterian Society. The addition will cost about \$15,000.

Holyoke, Mass.—Andrew McCormick, 29 Congress Ave., has the general contract for the erection of

BUILDING INTELLIGENCE.

(Advance Rumors Continued.)

a one-story brick addition, 30' x 100', to the Holyoke Plush Co.'s mill. The addition will be used for dye-house and cost \$20,000. Samuel L. Green, care American Thread Co., Holyoke, is architect and engineer.

Indianapolis, Ind.—The plans of eight Indianapolis architects for the new Indianapolis Board of Trade Building have been submitted to the special building committee appointed to consider them and are now on exhibition in the office of the Secretary of the Board. The Board granted the committee an indefinite time to submit a final report. When the report is submitted the preliminary steps will be taken to choose an architect and let the contract for the construction of the new \$165,000 building.

Kansas City, Mo.—The Board of Police Commissioners has contributed \$3,830 to the proposed \$11,380 fire and police station.

Lake Park, Ia.—Plans have been drawn by Murphy & Ralston for a two-story high-school building, 54' x 98'. Will have pressed brick, Bedford or Kasota stone, cedar shingles, galvanized-iron cornice, steam heat, yellow pine flooring, oak and yellow pine finish, boilers, blackboards, cementing, iron beams and columns. Cost, \$20,000. The foundation only will go in this fall.

Mandan, N. D.—Frank Scharle, of Dubuque, Ia., secured the contract to erect the Catholic Church. Cost, \$30,000.

New York, N. Y.—Plans have been filed with the Building Department for the new station-house to be built for Engine Company No. 30, now quartered at 253 Spring St. The new building will be at 278 to 284 Spring St., and will be one of the largest engine-houses in the city, being 72.5 feet front, and 75 feet deep, three stories in height, with a facade of brick and limestone. It is to cost \$75,000. The architect is Edward Pearce Casey.

The United States Realty and Construction Co. has sold the plot at the corner of Broadway and 69th St. The buyers, the leading spirit among whom is Harry B. Hoapt, will organize a company for the purpose of erecting on the property a twelve-story apartment-house with accommodations for three families on a floor. The site has already been excavated, and the building operation will be carried forward immediately.

Plans have been filed at the Bureau of Buildings for a five-story brick dwelling to be erected on the south side of 89th St., 135 feet east of 5th Ave., for Edward Thaw, of 1 W. 72d St. The cost of the building is estimated at \$75,000. Israels & Harder are the architects.

Omaha, Neb.—The Willow Springs Brewing Co. will enlarge and improve its plant at a cost of \$70,000.

Ottumwa, Ia.—The Ballingdale Hotel is to be remodelled throughout at a cost of \$50,000. Plans by F. W. Newell, Chicago.

Philadelphia, Pa.—The bid of Cramp & Co. has been accepted for the erection of a warehouse at the Schuylkill Arsenal, at 22d St. and Gray's Ferry Road for \$124,000. The building will be four stories high, of fireproof construction, covering an area 60' x 350'. The exterior will have a stone base, with a superstructure of brick. The work of erection will be begun at once.

Piqua, O.—The Board of Public Safety will request \$40,000 for improving the fire department.

Pittsburgh, Pa.—The Franklin Savings & Trust Co. will award a contract in a few days for a new banking-house to be erected at Penn Ave. and 29th

BUILDING INTELLIGENCE.

(Advance Rumors Continued.)

St., 12th Ward, for its own use. The building was designed by Vrydaugh & Wolf. It will be a brick, stone and terra-cotta one-story structure and will cover 24' x 100'. It is expected to cost \$40,000 to \$50,000.

Pittsfield, Mass.—A twelve-room building is to be erected on the Orchard Street School grounds. Cost, \$50,000. Plans by Architect Geo. E. Haynes.

Plainfield, N. J.—The Aluminum Press Co. has awarded to the H. Wales Lines Co., Meriden, Conn., the contract for three factory buildings. One of them 100' x 300', will be a machine factory; another 100' x 200', a foundry; and the third, 60' x 150', a power house. The contract involves \$70,000. Work of construction to commence at once.

Providence, R. I.—Irons & Russell, manufacturing jewellers, have plans in preparation for a factory on Clifford and Shepard Sts. It will be of brick, with steel frame, four and five stories, to cost about \$100,000. Martin & Hall, Union Trust Building, Providence, are the architects.

The design of Clarke & Howe for the proposed Federal building is the successful one among those submitted in the competition. Their drawings show a dignified structure in which no space appears to be lost. The erection of the building will be followed with much public interest, for no other in Rhode Island, except possibly the State-house, has a more conspicuous site. It will be of stone, four stories, and is to include the United States Post-office, United States Court-house, the Custom-house, a marine hospital, etc. The outside cost of the building is not to exceed \$950,000, although there is an appropriation of \$1,000,000.

Springfield, Mass.—Plans for the new building which the Springfield Fire and Insurance Co. is to erect on the corner of State and Maple Sts., are developing rapidly. It is expected that an announcement will soon be made as to the letting of the contract.

St. Charles, Ill.—Jenny & Mundie, of Chicago, have completed plans for two structures to be built in connection with the parental school for boys here. One is a power-house of 40' x 80' ground dimensions and the other is a kitchen of the same dimensions, both to be one-story high. The cost is estimated at \$35,000.

St. Joseph, Mo.—A site has been purchased for the erection of a hospital to cost \$35,000. Dr. Jacob Geiger is interested.

Tacoma, Wash.—Knowell Bros. have secured the contract for a four-story brick apartment-house for Frank B. Cole, at \$22,000.

Toronto, Ont.—Plans are now ready for a large addition to the mill of the Toronto (Ont.) Carpet Mfg. Co., Limited.

Traverse City, Mich.—The plans of W. D. Butterfield for the new \$25,000 church have been accepted by the Congregational Society. The material used will be stone and the site that of the present church.

Vancouver, Wash.—Brigham & Hoske, of Seattle, have the contract for the erection, plumbing, heating and gas piping of a double barracks, guard-house, two gun-sheds and two shops at the fort, at \$82,964.

Washington, D. C.—John T. Wilson, of Richmond, Va., is stated to have received the contract for erecting the Roosevelt Apartment-house at 20th and P Sts. The structure will be eight-story and cost \$175,000.

Webster City, Ia.—By the will of the late Mrs.



**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



**SAFE
SANITARY
SAVING**

UNLESS
you resort to mechanical means, cutting and prying, you cannot force entrance into lockers built of

Expanded Metal
for the reason that the material is heavy gauge steel cut and opened into diamond shaped meshes, without joints or connections.

We build them to suit any sized or shaped space. Send us specifications and we will send estimates.

MERRITT & CO.
1011 Ridge Avenue
PHILADELPHIA



The
W. J. PERRY
**Dumb
Waiter**
FOR
Hotels, Restaurants
Stores, Libraries and
Private Residences

Installed very simply and at reasonable cost.
Manufactured by
W. J. PERRY
591 Atlantic Avenue, Boston, Mass.
Local agents wanted. Correspondence solicited.

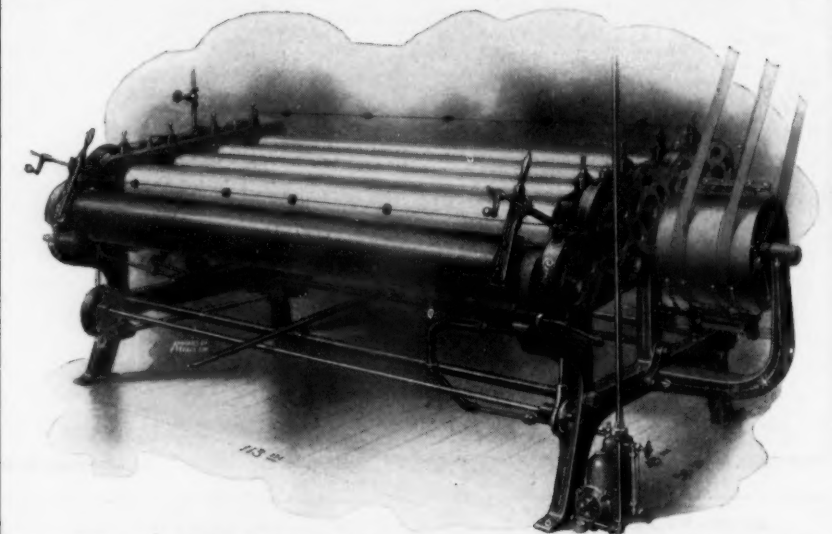
J. S. THORN CO.
Architectural Sheet Metal Works
Manufacturers and Erectors of Ventilating Skylights, Fire-proof Window Frames and Sash, and Opening Fixtures to operate ventilating sashes.
Nos. 1223 to 1233 Callowhill Street
PHILADELPHIA, PA.

BUILDING INTELLIGENCE.
(Advance Rumors Continued.)
Young this city is stated to have been bequeathed \$200,000 for a library.
Webster, Mass.—The Slater Woolen Co. will soon begin work upon a large mill. It will be of stone, at an estimated cost of \$100,000.
Weshawken, N. J.—The Baldwin Hose Co. is crying out for a new house.
Wilkesbarre, Pa.—Plans have been prepared for a four-story monastery to be erected at the Round Hills. Estimated cost, \$100,000.
Winipeg, Man.—The directors of the Canadian Pacific have approved plans for a hotel and depot for this city. Cost, \$3,000,000. Work will begin in the spring.
Worcester, Mass.—Plans are being prepared by McKim, Mead & White, architects, 160 Fifth Ave., New York City, for the School of Journalism which is to be built for the Columbus University. The building is to be of brick and stone structure, and will cost about \$500,000.
A building will be erected here for W. J. Whittall to be used for the manufacture of carpets. The

EXPANDED METAL
For Fireproofing and Concrete Construction
ASSOCIATED EXPANDED METAL COMPANIES Room 1205, 256 Broadway
NEW YORK

PASSAIC STEEL COMPANY Successor to Passaic Rolling Mill Company
A. C. FAIRCHILD, Pres. GEO. H. BLAKELEY, Chf. Engr. J. B. COOKE, Sec. and Treas.
Manufacturers, Contractors and Engineers for all kinds of

Structural Steel Work for Buildings
Plans, Specifications and Estimates Furnished on Application.
Main Office and Works, Paterson, N. J. Boston Office, 31 State St. New York Office, 5 Nassau St.



A. T. HAGEN CO. Modern Laundry Machinery
CHICAGO, ILL. ROCHESTER, N. Y.

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.

BUILDING INTELLIGENCE.
(Advance Rumors Continued.)
architects selected are Sheaf & Jaastard, of Boston. The building, which will be constructed of brick and stone, will be 75' x 238'.
Geo. H. Clemence, 405 Main St., has prepared plans for a brick dwelling and stable for A. P. Christy, to cost \$28,000.

COMPETITIONS.
SCHOOL-HOUSE. [At Harrisburg, Pa.]
Competitive plans will be received October 20 by the Bd. of Educ. for erecting a three-story brick and stone school. Estimated cost, \$50,000. J. B. LUCE, Chmn. 1450

PROPOSALS.
Treasury Department, Office of the Supervising Architect, Washington, D. C., September 30, 1903. Sealed proposals will be received at this office until 3 o'clock P. M. on the 21st day of October, 1903, and then opened, for the installation of a hydraulic mail lift, changes in present elevator equipment, etc., in the U. S. Court-house and Post-office at Minneapolis, Minn., in accordance with drawings and specification, copies of which may be had at this office at the discretion of the Supervising Architect. **JAMES KNOX TAYLOR**, Supervising Architect. 1450

Treasury Department, Office of the Supervising Architect, Washington, D. C., September 30, 1903. Sealed proposals will be received at this office until 3 o'clock P. M. on the 9th day of November, 1903, and then opened, for the construction (except heating apparatus, electric wiring and conduits), of the extension to the U. S. Post-office, and Court-house at Kansas City, Mo., in accordance with the drawings and specification, copies of which may be had at this office, or at the office of the Custodian at Kansas City, Mo., at the discretion of the Supervising Architect. **JAMES KNOX TAYLOR**, Supervising Architect. 1450

PROPOSALS.
REMODELLING COURT-HOUSE. [At Rayville, La.]
Bids will be received October 12 by the Bd. of Police Jury for remodelling and fireproofing court-house. Andrew J. Bryan & Co., archts., New Orleans. J. A. HICKS, Clk. 1449

PIPE SEWERS. [At Cape Charles, Va.]
Sealed proposals for furnishing material and constructing approximately: 2,455 feet 10-inch terra-cotta sewer; 4,555 feet 8-inch terra-cotta sewer; 2,145 feet 6-inch terra-cotta sewer; according to plans and specifications on file in the clerk's office, will be received by the Mayor and Council of Cape Charles, Va., until October 15, 1903. Van D. Hite-Smith, Engr. Specifications will be furnished on application to I. J. BURBAGE, Clerk. 1449

COURT-HOUSE. [At Denison, Ia.]
Notice is hereby given that sealed bids or proposals will be received at the County Auditor's office, Denison, Ia., until October 12, 1903, for all of the labor and materials required in the erection and completion of a court-house building, located at Denison, Crawford County, Ia., in accordance with the plans, details and specifications prepared and furnished by Geo. A. Berlinghof, of Beatrice, Neb., architect and superintendent for said Crawford County, and now on file at the office of the County Auditor. The steam heating, plumbing, gas-fitting, electric wiring and the furnishing of the court-house will not be included in this letting. Bids for same will be taken later. M. J. COLLINS, Auditor of Crawford County, Ia. 1449

METAL SHEATHING, IRON, ETC. [At Norfolk, Va., and Port Royal, S. C.]
Bids will be received October 13 at the Bureau of Supplies and Accounts, Navy Dept., Washington, D. C., for furnishing at the navy yard, Norfolk, Va., and Port Royal, S. C., a quantity of metal sheathing iron, steel, asbestos, copper pipe, pipe fittings, valves, etc. H. T. B. HARRIS, Paymaster Gen., U. S. N. 1449

REVOLVING DOORS

Keep Out all Snow, Wind, Rain and Dust. Cannot be Left Open, Blown Open or Slammed. Are Always Closed, yet Allowing Passage of Persons.

USED IN OFFICE AND PUBLIC BUILDINGS, BANKS, HOTELS, CHURCHES, THEATRES, CAFES, CLUBS, LIBRARIES, MILLS, FACTORIES, ETC.

SEND FOR CATALOGUE

Dept.
J.

VAN KANNEL REVOLVING DOOR CO.

Home Office and Factory: 524 East 134th Street, NEW YORK

Chamber of Commerce Bldg., CHICAGO.
North American Bldg., PHILADELPHIA.

40 Sheriff St., CLEVELAND.
Paddock Bldg., BOSTON.

RICHARD CROMWELL, Jr., President

JNO. J. DUFFY, General Manager

CHAS. H. CROMWELL, Vice-President

The Lafayette Mill and Lumber Co. SASH, DOORS, BLINDS AND LUMBER

Telephone Connections

Lafayette Ave. and P. B. & W. R. R., BALTIMORE, MD.

PROPOSALS.

ROADS AND WALKS.

[At Fort Meade, S. D.]
Fort Meade, S. D. Sealed proposals, in triplicate, will be received until October 17, 1903, for the construction of macadam roads and cement walks at Fort Meade, S. D. Information furnished upon application. Envelopes containing proposals to be marked "Proposals for Roads and Walks," addressed to C. B. Vogdes, Capt. 1450

Treasury Department, Office of the Supervising Architect, Washington, D. C., September 25, 1903. Sealed proposals will be received at this office until 3 o'clock P. M. on the 2d day of November, 1903, and then opened, for the construction (except heating apparatus, electric wiring and conduits) of the U. S. Post-office at Hastings, Nebraska, in accordance with the drawings and specification, copies of which may be had at this office, or the office of the Postmaster at Hastings, Nebraska, at the discretion of the Supervising Architect. JAMES KNOX TAYLOR, Supervising Architect. 1450

BUILDINGS.

[At Fort Totten, N. Y.]
Office of the Constructing Quartermaster, Fort Totten, Willets Point, N. Y. Sealed proposals for the construction, plumbing, steam heating and electric wiring of one administration building, one set of quarters for unmarried officers, one double set of captains' quarters, two double sets of no-commissioned staff officers' quarters, and mess hall and kitchen additions to each of three barracks, all of brick, foundations of stone, will be received here until October 22, 1903. Information furnished on application. CAPTAIN G. H. McMANUS, Constructing Quartermaster. 1450

EXTENSION OF BUILDING.

[At Mare Island, Cal.]
Sealed proposals endorsed will be received at the Bureau of Yards and Docks, Navy Department, Washington, until October 11, 1903, for constructing an extension of building No. 116, Navy Yard, Mare Island, Cal. Estimated cost, \$16,500. Plan and specifications will be furnished by the commandant of the navy yard named or by the Bureau upon deposit of \$15 as security for their return. MORDECAI T. ENDICOTT, chief of bureau. 1451

ELECTRIC TRAVELLING CRANE.

[At Boston, Mass.]
Bids will be received October 10 by Mordecai T. Endicott, Ch. of Bureau of Yards and Docks, Navy Dept., Washington, D. C., for furnishing a 3-motor electric travelling crane of 40,000 pounds capacity at Navy Yard, Boston. 1449

ROOF AND FLOOR CONSTRUCTION.

[At Washington Barracks, D. C.]
U. S. Engineer Office, Washington Barracks, D. C. Sealed proposals will be received here until October 13, 1903, for tin roof and asphalt floor construction at the Government Printing Office. Information furnished on application. JOHN STEPHEN SEWELL, Capt., Engrs. 1449

OFFICE-BUILDING.

[At Charleston, S. C.]
Bids will be received October 24 by Mordecai T. Endicott, Ch. of Bureau of Yards and Docks, Navy Dept., Washington, D. C., for a brick office-building, 39' x 60', at the Navy Yard, Charleston. 1450

COURT-HOUSE.

[At Beonville, Ind.]
Bids are wanted October 26 for erecting a court-house, to cost about \$65,000. Architects, Harris & Shopbell, of Evansville. 1450

LOCK GATES.

[At Plaquemine, La.]
U. S. Engineer Office, Custom-house, New Orleans, La. Sealed proposals for constructing lock gates, Plaquemine, La., will be received here until October 29, 1903. Information furnished on application. H. M. ADAMS, Lt. Col., Engrs. 1450

PROPOSALS.

SCHOOL-BUILDING.

[At Lima, O.]
Sealed proposals will be received by the clerk of the Board of Education of the Lima city school district until October 5, 1903, for the erection of a four-room school-building to be erected on the northeast corner of Calumet Ave. and Eureka St. in Lima, O., and a four-room school-building to be erected on the corner of Richie Ave. and Charles St., Lima, O., in accordance with plans and specifications which will be on file on and after September 15, 1903, at the office of J. A. Chapin, architect, Holland Building, Lima, O. ANNIE DISMAN, Clerk of the Board of Education. 1449

Treasury Department, Office of the Supervising Architect, Washington, D. C., September 22, 1903. Sealed proposals will be received at this office until 3 o'clock P. M. on the 28th day of October, 1903, and then opened, for the construction (including heating apparatus) of the extension to the U. S. Custom-house and Post-office at Bangor, Maine, in accordance with the drawings and specifications, copies of which may be had at this office or at the office of the Custodian at Bangor, Maine, at the discretion of the Supervising Architect. JAMES KNOX TAYLOR, Supervising Architect. 1449

CONSTRUCTION, HEATING, PLUMBING, ETC.

[At Fort Caswell, N. C.]
Sealed proposals will be received here until October 19, 1903, for constructing, plumbing, heating and wiring guard-house, hospital and one officers' quarters; constructing, plumbing and wiring Q. M. workshop, and 3 sets N. C. S. quarters at this post. Information furnished on application. PHILIP YOST, Q. M. 1450

PROPOSALS.

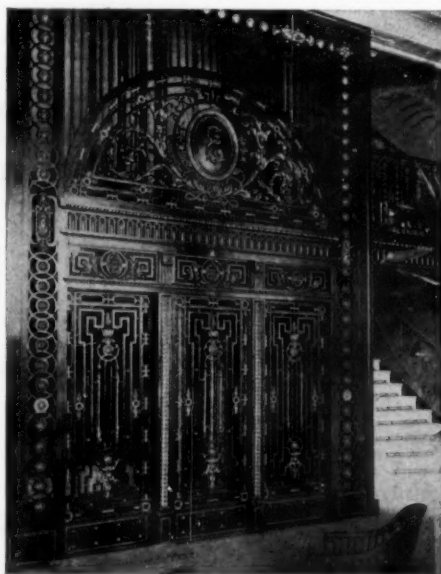
Treasury Department, Office Supervising Architect, September 19, 1903. Proposals will be received in this office on or before the 12th day of October, 1903, for two vault doors to be installed in the cash-room, office of the U. S. Treasurer, Treasury Department Building, Washington, D. C., in accordance with drawing and specification which may be obtained at this office. JAMES KNOX TAYLOR, Supervising Architect. 1449

SCHOOL-BUILDING.

[At Harrisburg, Pa.]
The Committee on Buildings, Furniture and Grounds of the Board of School Directors of the Harrisburg School District, will receive competitive plans for a twelve-room building to be located on State St., between 16th and 17th Sts., until October 20, 1903. The competition is open to all architects and only the plans adopted will be paid for. For further information apply to the undersigned. D. D. HAMMELBAUGH, Secretary, 121-123 Chestnut St. 1451

LIBRARY STACK WORK.

[At New York, N. Y.]
Sealed bids will be received by the Park Board at the office of the Department of Parks until Thursday, October 8, 1903, Borough of Manhattan, Contract No. 4. For work and materials for erection and completion of the library stack work in the New York Public Library, Astor, Lenox and Tilden Foundations, 5th Ave., 40th and 42d Sts. Blank forms may be obtained and plans may be seen at the office of the Department of Parks, the Arsenal, Central Park, and also at the office of the architects, Carrère & Hastings, No. 28 E. 41st St. For full particulars see City Record. WILLIAM R. WILLCOX, JOHN E. EUSTIS, RICHARD YOUNG. 1449



The Ornamental Iron Work
throughout this building
executed by

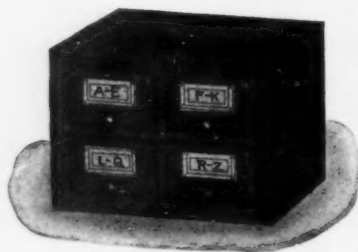
RICHEY,
BROWNE &
DONALD

Iron and Bronze

Borden and Review Aves.
LONG ISLAND CITY, N. Y.

Elevator Enclosure, Hotel Essex, N. Y. City,
Howard, Cauldwell & Morgan, Architects

Architects, Attention



Have you seen that clever new book which we have just issued, illustrating and describing a distinctively new line of high grade

Office, Bank and Library Steel Filing Devices

combining beauty and strength, "the Armor Plate of Modern Business"?

If you are interested write now for copy, and note possibilities in this line.

Remember we make anything in Sheet Steel.

The Berger Mfg. Co.
CANTON, OHIO

CHICAGO & ALTON RAILWAY

"Of all inventions, the alphabet and the printing press alone excepted, those inventions which abridge distance have done most for the civilization of our species."—MACAULEY

PERFECTION IN TRANSPORTATION
IS FURNISHED BY THE
CHICAGO & ALTON RAILWAY

The heaviest steel rails, laid on a roadbed of crushed rock, make its tracks the smoothest. Over this dustless highway are run the most palatial trains in the world—the acme of luxury and comfort.

AMERICA'S MOST POPULAR RAILWAY—JUSTLY TERMED "THE ONLY WAY"

BETWEEN
Chicago, St. Louis, Kansas City and Peoria.
GEO. J. CHARLTON, Gen. Pas. Agt., Chicago, Ill.

Perfect Passenger Service
Fast Freight Service

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

BRONZE

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

**WROUGHT
IRON****FERROINCLAVE**

FIREPROOF
ROOFING

NON DRYING PAINT

CONCRETE

FERROINCLAVE

Laid Like Ordinary Corrugated Iron
 Then Cemented on Both Sides

LIGHT, CHEAP, MOISTURE AND ACID PROOF

The Brown Hoisting Machinery Co.
CLEVELAND, OHIO

NEW YORK**PITTSBURG****NEW ENGLAND MATERIAL-MEN AND CONTRACTORS.****ARTISTIC WIRE & METAL WORKS.**

MORSS & WHYTE,
 75-81 Cornhill, Boston, Mass.

BAIRD'S HAND-MADE SILVER GLASS.

REDDING, BAIRD & CO.,
 83 Franklin St., Boston, Mass.

BLUE PRINTING.

B. L. MAKEPEACE,
 345 Washington St., Boston, Mass.

CHAS. E. MOSS,
 Rapid Printing Papers,
 38 Broad St., Boston.

PARKS & JEEVES,
 34 Merchants Row, Boston, Mass.

BUILDINGS TORN DOWN.

A. A. ELSTON & CO.,
 166 Devonshire St., Boston, Mass.

CONTRACTORS & BUILDERS.

McKAY & WOOLNER,
 19 Harvard Place, Boston, Mass.

WILLIAM L. RUTAN,
 1016 Tremont Bldg., Boston.

DOORS, WINDOWS, ETC.

E. A. CARLISLE, POPE & CO.,
 2 Sudbury St., Boston, Mass.

DRAWING INSTRUMENTS.

G. G. LEDDER,
 (Formerly with Buff & Berger)
 9 Province Court, Boston, Mass.

ELECTRICAL CONTRACTORS.

ERICKSON ELECTRIC EQUIPMENT CO.,
 280 Devonshire St., Boston.

FIRE-ESCAPES.

STANDARD FIRE-ESCAPE & MFG CO.,
 120 Milk St., Boston, Mass.

FLAG POLES.

BOSTON FLAG POLE CO.,
 169 Broadway Exten., Rm. 2.
 Tel. 112.2. So. Boston, Mass.

MARBLE DEALERS.

COLUMBIAN MARBLE QUARRYING CO.,
 (Branch Office.)
 186 Devonshire St., Boston, Mass.

MASONS AND BUILDERS.

MORRILL & WHITON CONSTRUCTION CO.,
 35 Federal St., Boston, Mass.

MEMORIAL WINDOWS.

HARRY ELDREDGE GOODHUE,
 23 Church St., Cambridge, Mass.

MODELLING AND ORNAMENTAL PLASTER.

SLEEP, ELLIOT & KING CO.,
 351 Cambridge St., Boston.

ORNAMENTAL PLASTER-ING.

HERBERT FOWLE,
 43 Bristol St., Boston, Mass.

PHOTOGRAPHIC SUPPLIES.

ROBEY-FRENCH CO.,
 34 Bromfield St., Boston, Mass.
 Cameras.

PHOTOGRAPHY.

LEON E. DADMUN,
 169 Tremont St., Boston, Mass.

E. PERCY OLIVE,
 44 Washington St., Boston.
 Tel. 1333-3 Richmond.

N. L. STEBBINS,
 132 Boylston St., Boston, Mass.

PLASTERERS.

GALLAGHER & MUNRO CO.,
 166 Devonshire St., Boston, Mass.

PORTABLE OVENS.

H. A. JOHNSON & CO.,
 224 State St., Boston, Mass.

ROOFING DUCK.

C. H. BATCHELDER & CO.,
 234 State St., Boston, Mass.

SASH CORD.

SILVER LAKE CO.,
 78 Chauncy St., Boston.

SEAM-FACE GRANITE.

GILBRETH SEAM-FACE GRANITE CO.,
 Park Row Building, New York.
 176 Federal St., Boston.

STABLE FIXTURES.

BROAD GAUGE IRON STALL & VANE WORKS,
 53 Elm St., Boston, Mass.

STONE CARVING AND MOD-ELLING.

HUGH CAIRNS,
 48A Sudbury Street, Boston.

TELEPHONES.

S. H. COUCH CO.,
 156 Pearl St., Boston, Mass.
 (Send for Circular A.)

TILES & FIREPLACES.

GEORGE E. CRAWLEY & SON,
 1 Somerset St., Boston, Mass.

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 draw-
 ings or other services "on approval" and
 without adequate pecuniary compensation.

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

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

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

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

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

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

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

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

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

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

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

FOR the convenience of customers in New York and the metropolitan district,



and especially of architects and their clients, the Exhibit Rooms and Contract Department heretofore connected with the General Offices, Numbers 9, 11 and 13 Murray Street, have been transferred by the

Yale & Towne Mfg. Company to 242 FIFTH AVENUE.

Customers are invited to avail of the improved facilities thus offered for the selection of locks and hardware for buildings of all classes.

Special provision is made for the inspection and selection of artistic hardware of the higher grades.

Hereafter all correspondence relating to Contract Work in the metropolitan district should be addressed as above.

The Northwestern Terra-Cotta Co.

Manufacturers of High Grade

Architectural Terra-Cotta CHICAGO

PERTH AMBOY
TERRA-COTTA COMPANY,

—OF—
PERTH AMBOY, NEW JERSEY.

OFFICE, 160 Fifth Ave., NEW YORK.

BOSTON AGENTS:

WALDO BROS., 102 MILK STREET.

BOOKS:

"Norman Monuments of Palermo."

Illustrated with 50 Plates: 13" x 17 1/2".

Price bound, \$10.00. Unbound, \$9.00.

AMERICAN ARCHITECT COMPANY, Publishers.

BOOKS:

"Minor Fountains."

40 Gelatine Plates, on bond paper, 9" x 11".

In Envelope. Price, \$5.00.

AMERICAN ARCHITECT COMPANY, Publishers.

Cathedral of St. John the Divine.



NEW YORK, N. Y.



Illustrations of the competitive designs for the great Protestant Episcopal Cathedral, now building on Bloomingdale Heights, New York

In all, fifty-seven plates [loose], 14 x 20 inches, printed on plate-paper.

PRICE, \$2.50 PER SET.

American Architect Company,
BOSTON, MASS.

The C. T. NELSON CO.

WHOLESALE MANUFACTURERS OF

VERANDA COLUMNS

(BORED OR BUILT-UP)
ANY SIZE—UP TO 36 INCH DIAMETER
AND 24 FEET LONG

CARVED CAPITALS

NEWELS—BALUSTERS—

RAIL—ETC.

DETAIL WORK

A SPECIALTY

WRITE FOR CATALOGUE AND PRICES

•COLUMBUS, OHIO•

[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.....
ARTISTIC WIRE AND METAL
WORKS.

Morris & Whyte, Boston.....

ART METALWORK.

Art Metal Construction Co., James-
town, N. Y.....

ASPHALT.

Neuchatel Asphalt Co., New York...

ASPHALT ROOFING.

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

BLUE PRINTS.

Makepeace, B. L., Boston.....

Moss, Chas. E., Boston.....

Parks & Jeaves, Boston.....

Spaulding Print Paper Co., Boston
.....(eow)

BRASS FINISHERS.

Marble Co., W. P., Boston.....

BRONZEWORK (Ornamental).

Richey, Browne & Donald, Long
Island City, N. Y.....

Tyler Co., The W. S., Cleveland, O.....

Winslow Bros. Co., The, Chicago, Ill.

BUILDINGS TORN DOWN.

Elston & Co., A. A., Boston.....

CAPITALS (Carved).

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

CARVING.

Waddell Mfg. Co., Grand Rapids, Mich.

CEMENT.

Alsen's Cement Works, N. Y....(eow)

Atlas Cement Co., New York.....

CLEAN-OUT.

Craig, David, Boston.....

CLOCKS.

Blodgett Clock Co., Boston.....

Howard Clock Co., The E., Boston...

CONSERVATORIES.

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

CONTRACTING.

Flynt Building & Construction Co.,
Palmer, Mass.....

Rutan, William L., Boston.....

CONTRACTORS AND BUILDERS.

McKay & Woolner, Boston.....

Rutan, William L., Boston.....

CORDAGE.

Samson Cordage Works, Boston....(eow)

CRANES.

Northern Engineering Works, De-
troit, Mich.....

CUPOLAS (Foundry).

Northern Engineering Works, De-
troit, Mich.....

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.....

DRAWING INSTRUMENTS.

G. G. Ledger, Boston, Mass.....

DUMB-WAITER.

Perry, W. J., Boston.....

ELECTRICAL CONTRACTORS.

Erickson Electric Equipment Co.,
Boston.....

ELECTRIC SIGNALS.

Elevator Supply & Repair Co., New
York.....

ELEVATORS, ETC.

Kimball Bros. Co., Council Bluffs, Ia.

Morse, Williams & Co., Philadelphia.

Whittier Machine Co., Boston.....

ELEVATORS (Foundry).

Northern Engineering Works, De-
troit, Mich.....

ELEVATOR SIGNALS.

Herzog Telesome Co., New York...

ENGINEERS.

Jager Co., Charles J., Boston.....

ENGINES (Hot-Air).

Rider-Ersson Engine Co., New York

FAN SYSTEM.

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

FAUCETS (Combination).

Union Brass Works Co., Boston.....

FILING DEVICES.

Art Metal Construction Co., James-
town, N. Y.....

FILTER.

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

FIRE-ESCAPES.

Standard Fire-escape & Mfg. Co., Bos-
ton.....

FIREPROOFING.

Associated Expanded Metal Co., New
York.....

Brown Hoisting Machinery Co., The,
New York.....

National Fireproofing Co., Pittsburg,
Pa.....

FIREPROOF LATHING.

Hayes, Geo., New York.....

FIREPROOF SHUTTERS.

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

FLAG POLES.

Boston Flag Pole Co., South Boston.

FLOOR POLISH.

Butcher Polish Co., Boston.....

FOUNDRY EQUIPMENT.

Northern Engineering Works, De-
troit, Mich.....