



Public Library.
WASHINGTON, D. C.
RECEIVED

VOL. LXXX

SATURDAY, APRIL 18, 1903

No. 1425



SUMMARY:—

More Trouble with Chicago Drinking-water.—Concrete Piles.—Fall of a Building in Brookline, Mass.—The Boston Elevated Railroad must pay for being noisy.—The Labor Situation in Chicago satisfactory.—Architecture at the new University of Porto Rico.—The Career of the late F. C. Penrose.—The Fluctuations of the Prices of the Materials of Construction.—The old Hudson River Tunnel.—The International Congress of Architects to be held at Madrid.—The Value of Paris Houses and their Rental Returns.—Building Artificial Ruins.	17
THE METRIC-SYSTEM.	19
SAND-LIME BRICK.	21
SOCIETIES.	23
ILLUSTRATIONS:—	
U. S. Post-office, Aberdeen, S. D.—Details of the Liberal Arts Building for the Louisiana Purchase Exposition, St. Louis, Mo.—Proscenium-Boxes: Majestic Theatre, Boston, Mass.—Exterior Order: Majestic Theatre, Boston, Mass.	
Additional: The Hôtel de Paris, Monte Carlo.—Half-timber Houses, Wernigerode, Saxony.—Front and Rear Views: Liberal Arts Building for the Louisiana Purchase Exposition, St. Louis, Mo.—The Majestic Theatre, Tremont St., Boston, Mass.	23
NOTES AND CLIPPINGS.	24

AN apartment-house in process of construction in Brookline, not far from the Boston line, fell a few days ago, killing one man, and seriously injuring several others. The cause of the fall seems clearly to have been the failure of the retaining-wall at the front of the building, but the reason of the failure of the wall is not so apparent. According to the Superintendent of Buildings for the town of Brookline, who had visited the structure every day, it conformed in all respects, including, presumably, the thickness of the retaining-wall, to the building ordinances of the town. It appears that a two-inch water-main had burst, close to the front of the house, just before the accident, and the architect is inclined, very justifiably, to think that the soaking of the ground next the wall by the escaping water may have increased the pressure on the wall sufficiently to force it in. The Superintendent of the town water-works, on the other hand, thinks it "absurd" to suppose that "an insignificant little two-inch water-pipe" could be the source of the catastrophe. An "insignificant little two-inch water-pipe" could easily be the cause of worse troubles, if its action should happen to be exerted in the right direction, but it may be observed that, in any revision of the Brookline building-laws, it would be an excellent thing to specify thicknesses for retaining-walls which would make them secure beyond doubt against the consequences of any such common accident as the bursting of a water-main near them.

THE problem of the drainage of Chicago, and the purification of its drinking-water, has been complicated of late by the discovery that, notwithstanding the expenditure of forty million dollars in digging a canal through which to pour the sewage of the city into the Mississippi, the water drawn from Lake Michigan for drinking is about as foul as ever, owing to the circumstance, which seems to have just come into notice, that the neighboring cities discharge sewage into the Lake, and that the sewage of these cities is drawn into the pipes which supply Chicago. The Chicago people, if they are not always profoundly wise, are at least energetic; and an application has been made to the Illinois Legislature for the establishment of a Metropolitan Sewerage Commission, empowered to require the cities bordering the Lake to intercept their sewage, and convey it into the Chicago Canal. This provision would not, of course, affect Milwaukee, or any other Wisconsin or Michigan towns; but it would be of some present use. A question still remains, however, in the possibility that St. Louis, and the other river towns, may secure from the United States courts an order, requiring Chicago to discontinue pouring sewage into the Canal. If Chicago cannot drain into the Canal, the neighboring towns certainly cannot, and the whole problem will have to be taken up again from the beginning. We do not pretend to say what the outcome will be, or should be; but it is difficult not to associate with the Chicago Drainage Canal the thought that future generations of dwellers in the Mississippi Valley may bitterly regret the loss of the fertilizing floods which will be nowhere needed more than in the light loam of the prairie country. Victor Hugo told the Parisians that they were pouring into the Seine "fields of golden grain, and herds of lowing kine," just as the Romans poured into the Tiber "first the Campagna, then Latium, and at last Italy"; and the Parisians listened to him; but the Illinois Victor Hugo, who can see with the eye of prophecy the beautiful fields of Illinois waste and barren, and can get engineers and aldermen to listen to his wailings, does not seem to have appeared.

THE case of the property-owner in Boston who claimed damages for the injury to his estate through the noise incident to running trains over the elevated railway in front of it has been decided by the Massachusetts Supreme Court in his favor, and it is, therefore, established that noise is a nuisance for which damages can be recovered. The railroad company has fought the case tenaciously, as it affords a precedent for the decision of a multitude of similar ones, but the public is certainly a gainer by the result. For some reason, whether because of the light structure of the roadway, which was intentionally reduced as nearly to a skeleton as possible, in order not to obstruct light unnecessarily, or because of the use of steel instead of wrought-iron, the Boston elevated railroad is very noisy. It is said that, since the present case was brought into court, the deafening racket of the elevated trains has been somewhat mitigated; but a great deal more remains to be done, and it is due to the railway company to say that it has for some time been experimenting with devices for reducing noise. The same problem is under consideration in Berlin, and the Boston management will anxiously watch the result of the experiments of the German company. So far, neither party seems to have met with much success. The Berlin engineers have, apparently, rejected every device that they have tried, as being practically useless; and, in Boston, no extensive trials have been made of any plan.

IN Chicago, which was once the centre of union antics, the building trades have been assured of a peaceful, and, we hope, of a prosperous season, by an agreement between the contractors and the men, satisfactory to both, which is to remain in force for a year. The only people concerned in building who have refused to concur in the agreement are the journeymen steam-fitters, who are so few in number that the great building world is not likely to distress itself very much in their behalf, and the "excavating teamsters." This, we suppose, means the people who drive the tip-carts in and out of new cellars. It is rather curious to find that this difficult and delicate industry has been monopolized by a "union," which expects, we suppose, to have building operations in Chicago at its mercy. We make no charge for the suggestion to people who do not wish to have their income stopped, and their business interrupted until the members of this valuable organization are "placated," that it might be an excellent idea to import from Africa some gorillas, to have in readiness for the contingency of a struggle between Labor and Capital in this department. It would not take very long training to teach an intelligent ape to stand on a foot-board and yell, while a horse drew him in and out of an excavation, and the most determined walking-delegate would think twice before trusting himself within reach of the claws of one of these noble animals for purposes of "expostulation."

A NOVEL piece of construction, for this country, is in progress in New York, where concrete piles are being driven for the foundation of a building on Pearl Street. The ordinary concrete pile, made either by driving a wooden pile, and then extracting it, and filling the hole with concrete, or by excavating for the concrete in some other way, is familiar enough here; but the piles in question are driven, like ordinary wooden ones. Each pile is twenty-eight feet long, and twelve inches square in section, tapering to a point at the end; and is composed of one-to-six concrete, allowed to harden for three weeks before being used, and stiffened by a longitudinal iron rod on each side, and bound with steel wire bands at eight-inch intervals. Although the piles are very heavy, and the stiffening seems unnecessarily clumsy, there is no apparent reason why they should not answer an excellent purpose.

DR. LINDSAY, the Commissioner of Education for Porto Rico, proposes to establish in the island a university, to be known as the University of Porto Rico, and to be devoted to the higher education of the natives. Together with the humaner letters he proposes to give courses in medicine, law and architecture, with such other branches as may be determined upon later. Probably the architectural course will, at first, include civil and sanitary engineering, and the field for the exercise of the combined professions is likely to be quite extensive in the island. Dr. Lindsay's efforts will be observed with great interest and sympathy by the people of the United States, and there seems to be no reason why they may not be completely successful. Communication among the West India islands is now so easy that a good institution for higher education in Porto Rico is likely to draw students from all parts of the archipelago, who will be glad to find what they want nearer, and in a more congenial climate, than in Europe or the United States. It must be remembered that the West India islands form the most densely populated territory in the world; and, although the present inhabitants, as a rule, are not distinguished for intellectual culture, no one can say what they may become with better opportunity.

YOUNG architects who have a taste for archæology might with advantage study the career of the late Francis C. Penrose, whose name will be always associated with the most interesting and important discoveries ever made in connection with ancient architecture. Mr. Penrose was a graduate of Cambridge University, where he devoted himself to classical history with such success that he won a travelling-scholarship, entitling him to three years' study in Italy and Greece. It was in the course of his investigations as holder of this scholarship that he noticed that the lines of the Parthenon, the Propylæa, and other ancient buildings in Greece and Grecian Italy were not straight, but curved; and he was the first among all the students of Greek architecture to stretch wires along the entablature of the Parthenon, and measure the curvature of its apparently horizontal lines. He followed this by accurate determinations of the plan, the spacing and the inclination of the columns of this and other buildings, and collected in his famous book, the "*Principles of Athenian Architecture*," mainly written before he was thirty years old, the most interesting and surprising observations ever presented to the profession. We have become so familiar with the Greek corrections that it does not surprise us to find similar corrections in mediæval buildings, such as Professor Goodyear has shown us; but, when Penrose's book appeared, no one, perhaps, believed in the existence of such corrections, and his conclusions were disputed vigorously, until repeated tests had shown their accuracy, and had proved them to be common to all classical antiquity.

THE last *Bulletin* of the Department of Labor contains a very curious table of the fluctuations of wholesale prices of a great number of commodities during the thirteen years from 1890 to 1902. Naturally, the variations in the prices of building materials would interest our readers most, and, as every one knows, they have been violent enough, but merchandise of other kinds has varied still more. The greatest fluctuations noted seemed to be in the prices of fruit, which, no doubt, depend very much on the abundance or scarcity of particular kinds at any given time. Thus, Southern dried apples, which cost from eleven to thirteen cents a pound in 1891, could be purchased for a cent and a half in 1897; and currants varied about as much. The variations of prices of commodities of other kinds seem quite arbitrary. The majority of prices have risen during the term, but there are some striking exceptions. Thus, plate-glass, which, in 1890, cost fifty-three cents a square foot, could be bought in 1897 for twenty cents; while window-glass rose from one dollar and twenty-one cents a box, in 1892, to three dollars and eighty-three cents in 1901. Steel rails also varied, in the same eccentric manner, from more than thirty-five dollars a ton, in 1890, to seventeen dollars a ton in 1898; then, as our readers know, rising again. Lead pipe, similarly, fell about one-half from 1890 to 1897, then also rising again. The goods which seem to have fallen, with the least tendency to recovery in price, are certain cotton manufactures, particularly hosiery, gingham, calicoes and similar goods, most of which sold for considerably less in 1900 than in 1890. Unfortunately, the statistics given do not, in most cases, extend beyond 1897 or 1898, both of which were years of comparative depression; but, where prices are quoted for 1901 or 1902, they show that, except in the highly-protected industries, the losses have not, as a rule, been regained.

THE old Hudson River tunnel, after many financial vicissitudes, has passed into the hands of a new company, and work upon it has been resumed. One of the twin tunnels was nearly finished before the work was abandoned, two or three years ago, and it is hoped that this can be completed this autumn, and that tracks can be laid through it, and cars run over them, early next year. Although the time saved in crossing the river by using the tunnel cars, in place of the ferry-boats, is not more than ten or fifteen minutes, the advantage to the public of being able to get into an electric-car, say at Madison Square, and being transported without change of cars, and without risk of delay, to Jersey City, or Newark, or any of the beautiful suburban towns on the hills beyond, will be enormous, and it is safe to predict a very large business for the tunnel line.

THE next International Congress of Architects is to be held in 1904, not in St. Louis, as American architects would have wished, but in Madrid. The details of the Congress are not yet published, but it appears that it will assemble in Madrid, presumably in the Royal Academy of Fine-Arts, on the sixth of April, continuing seven days. Those of our readers who speak Spanish will find this an admirable opportunity to visit the capital of Spain under the most favorable auspices, and at the pleasantest season of the year; and it is much to be hoped that the profession in America may be represented.

THE Municipality of Paris has published a report on the value of the houses in the city, and the estimated income of the people who live in them, which has many points of interest. Every one knows that the people in Paris live mostly in tenement-houses, but the cost of these houses varies enormously in different parts of the city. The most expensive ones are found in the quarters of the Champs-Élysées and the Chaussée d'Antin, the average cost of each building being about one hundred and thirty thousand dollars; while the cheapest are those of the region about the cemetery of Père Lachaise, and the quarters known as Charonne and the Maison Blanche, the average cost there being only from six to eight thousand dollars. Deducting shops, stores, offices and workshops, the Parisian "enumerators" found about eight hundred and eighty-four thousand distinct dwellings within the city limits. This gives a small average family, as the population of Paris is little over three millions; but small families are characteristic of France, as of this country. The enumerators also investigated the rent of tenements in each quarter, and from their results the report gives an ingenious estimate of the average income of the people who live in them, based on the observation that, for the poorest people, house-rent takes about one-fifth of the family income, while the proportion diminishes as the family fortune improves. On this theory, the author of the Report finds that the richest people live in the quarter of the Champs-Élysées, where the average income of each family is estimated at seven thousand dollars. In the Chaussée d'Antin, although the houses are very costly, rents are low, the reason probably being that the rich bankers who once lived in them have now taken their habitations elsewhere, but keep their offices in the old buildings, and let the other rooms to such tenants as they can find. In the outlying quarters to the south and east, the average family income, reckoned in the same way, is very small, being only two hundred dollars in the very poorest region.

ONE form of architectural development which is still strange to us is the construction of ruins. Every one remembers the Englishman who excused himself from some engagement on the ground that he was "building a new ruin" on his estate, and could not leave it; and the taste for these objects was formerly more prevalent in France and Italy, and on the banks of the Rhine, than even in England. Of late, it seems to have revived, at least in France, where concrete is used to simulate crumbling walls, and masses of debris, with much success. One of the last of these, which is described in *La Construction Moderne*, is the Château de Lattainville, built, not far from Paris, on a spot which undoubtedly served as the site of a mediæval castle, the moat and other works being still visible. Besides the main building, which, however dilapidated in appearances, forms a spacious and comfortable dwelling, various accessories, such as a bridge over the moat, stairs, mantels and so on, have been executed in the same material. Although it would be too much to say that no objection can be found, architecturally, to such a construction, the work is, in this particular instance, carried out with great cleverness; and, if architectural masquerading is permissible anywhere, it is, perhaps, in a rich man's summer cottage.

THE METRIC-SYSTEM.¹

THE following is a copy of a circular sent out by the retiring President of the Engineers' Society of Western New York:—

There is a Bill, viz, H. R. 123, now on the Calendar of the House of Representatives of the Congress of the United States, entitled:—

"A bill to adopt the weights and measures of the metric-system as the standard weights and measures in the United States."

"Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, that on and after the first day of January, 1904, all Departments of the Government of the United States, in the transaction of all business requiring the use of weight and measurement, except in completing the survey of public lands, shall employ and use only the weights and measures of the metric-system; and on and after the first day of January, 1907, the weights and measures of the metric-system shall be the legal standard weights and measures of and in the United States."

This bill has been reported favorably by the Committee on Coinage, Weights and Measures, and it is said that its friends intend to urge its passage at the coming session of Congress.

The Members of Congress from Western New York have signified a desire to learn the opinions of engineers and other "practical men" about the desirability of the passage of this bill in its present form at the present time.

The matter was brought to the attention of the Society last spring, and again at the October and November meetings. At the latter it was referred to the members attending the annual meeting, and the Secretary was directed to bring it to the attention of each person connected with our Society, so that they could come to the annual meeting prepared to express their opinions.

It will be noted, by reading the bill, that it is intended to change the entire system of weights and measures of the United States, a compulsory measure making the metric-system the only legal standard of the country on and after January 1, 1907, a change affecting every man, woman and child much more than any tariff, and they intend to do this without any notification whatever to the people of the United States, or discussion by them.

We hope that you will be prepared to express your opinion on this matter at the annual meeting. W. A. HAVEN, President.

THE foregoing circular explains the appearance of this paper. The support of the House Committee seems to have been obtained by misrepresentation and misstatement of facts on the part of the adherents of the bill, for the true issue involved is not academic.

The Western Society of Engineers of Chicago recently had a discussion upon this subject and sent out 421 letter-ballots. One hundred and fifty-three replies were received, showing 130 votes for and twenty-three against the system.

The Committee of the Franklin Institute has also reported in its favor.

What is known as the metric-system has been defined as "the national characteristic of the only nationality that ever officially denied the Divine existence." It was born amid the riot and disorder of the French Revolution, in 1795, coincident with the attempt to abolish the Christian religion by legislation, and made compulsory by the same means at the same time. Notwithstanding this, it was not until 1840 that it could be said in any sense that it was adopted, and to-day, on the eve of 1902, the old French inch (*système ancien*) is still in legal use in France.

The length of the metre, owing to error in the determination of the meridional arc, is arbitrary, and the accurate length of the bar representing it had not been determined, according to various authorities, until about 1889.

We have the determinations of Kater, Hassler, Bailey, Comstock, Rogers and Clarke (the determination of Clarke being used by the United States Coast and Geodetic Survey), the so-called Committee Metre, and last, but not least, we have the United States law, which establishes its length as something which agrees with none of them.

At the annual meeting of the American Society of Mechanical Engineers, now being held in New York City, Mr. F. A. Halsey, Associate Editor of the *American Machinist*, will present a paper on this subject, from an advance copy of which free extracts will be made in the following. Detailed facts, figures and references will be found in his paper, which will more than repay perusal.

If legislation, compulsory though it be, meant adoption, which the advocates of the system assume, they might have some ground for argument. As facts, we find:—

That to-day, after twenty-eight years of compulsory legislation, enforced by fines, the old German units persist in that country in all textile industries, and in very many mechanical industries, and the English system of pitch threads is universal. The carpenters and other building-mechanics nearly universally use the old Rhenish inch (1.0297 English inches), and rules graduated in Rhenish and English, and sometimes French inches are purchasable in every hardware-store in Germany.

That to-day, after 107 years of compulsory legislation, the old

French *pouce*, or inch (1.06576 English inches), is the standard in France in all textile industries, national pride and despotic Government combined not having succeeded in eradicating it, and the same condition of affairs obtains in Italy, in Switzerland and in Austria.

And to-day, after eighteen years of compulsory legislation, it is the common practice in Mexico to use American measurements for all railroad machinery, while in South, or Spanish, America, nearly every country of which is nominally metric, their old measures are still in common use. A list of forty-seven of these measures may be found in the monthly bulletin of the International Bureau of American Republics, issued at Washington, D. C., for October, 1902, and also in many of the consular reports.

Every country in the world, without any exception whatever, still measures gems by the carat.

As to argument on foreign trade, the National Machine Tool Builders' Association condemned the measure at their Cleveland convention, October, 1902, for reasons which may be found in their proceedings and in Mr. Halsey's paper.

Mr. Andrew Carnegie, in his inaugural address as Rector of St. Andrew's University in Scotland, said:—

"America now makes more steel than all the rest of the world. In iron and coal her production is greatest, and it is also so in textiles. She produces three-quarters of the world's cotton. The value of her manufacturers is about triple that of your own. Her exports are greater, and the clearing-house exchanges at New York are almost double those of London."

To what do we owe our national supremacy? The question being asked of Queen Victoria, relative to that of England, she handed the questioner the Bible.

Every coin of our nation bears the motto "In God we Trust." Many weigh the name on scales that deny Him, but we further propose to perpetuate what we owe to Christianity, by adopting for a national standard of weights and measures, which will be carried into the daily life of each individual of our nation, "the national characteristic of the only nationality that ever officially denied the Divine existence." Shall the mountain go to Mohammed at last? I apologize to one of our members present for stealing a little of his thunder, but cannot here refrain from asking, What has posterity done for us that we should do this for posterity?

In the report of the Committee on Coinage, Weights and Measures of the House of Representatives occurs the following:—

"The practical applications of scientific work have in many cases been seriously handicapped or retarded, owing to the necessity of converting formulas derived in the metric-system to equivalent formulas in the common system."

Are we to suppose, then, that the reverse process is easier? Is it so much simpler to transform the thousands of existing English formulas to metric measures that this change is desirable? Do men of the calibre implied by this reasoning call themselves scientists? Is it a fact that our scientists, and those capable of applying science, are so highly educated that they are unable to transform a formula, and would sooner sacrifice our industrial welfare than attempt it? If so, if scientists are unable to cope with the metric-system, what about the millions of our everyday people who do not profess to be such?

Again, the report of the Committee says: "It should be emphasized that this measure in no way contemplates any change in any existing technical standards, such as screw-threads, wire-gauges, lumber measures and numerous others, except as manufacturers and other interests find it to their own interest to make the change."

This is a plain misrepresentation of facts, for the law does not read this way. "Shall" does not imply permissiveness, but if it be susceptible of such interpretation, it is the worst piece of legislation that ever appeared upon our country's statute-books. It adds a new, without wiping out the old, system, and the people at large must necessarily bear the burden, pay for the change, and then learn both systems. To-day the double system is used by comparatively few, and these few presumably able to cope with it; then the double system will be general and all must learn it. To build a house we must measure the area of its floors in the metric-system, and lay them with boards cut on the English system; must describe our door-hinges by metric measures and buy screws to fasten them on with by English measures and so on through the list. And such a system is recommended for its simplicity!

If, by the terms of this bill, the Government is to use this system in all its transactions, and if the above report by the House Committee be construed as an interpretation of the law, the Government will go without many kinds of machinery altogether.

Again, the exception made by the bill relative to surveys of the United States public lands perpetuates our present system, while in the very same breath no action in law can be maintained except in measures based on the metric one.

Mr. Halsey says, "All knowledge is comparative, and comparison is impossible except through the use of weights and measures."

In a letter of the Brown & Sharpe Manufacturing Company to the House Committee, its writer says, "The question of weights deals rather with the future, but . . . linear measures are tied irrevocably to the past."

This should be emblazoned upon the walls of the halls of Congress and upon those of the rooms of its Committee. Suppose it is true that the benefit and ease of calculation, arising from the use of the decimal-system, be almost limitless in extent, as claimed by many calling

¹ A paper by C. H. Tutton, Member Engineers' Society of Western New York, read before the annual meeting of the Engineers' Society of Western New York, December 2, 1902, and printed in the *Journal of the Association of Engineering Societies*.

themselves scientists, it still remains that every experiment that ever has been made, every result that ever has been obtained, stands today in the original measures; they are tied irrevocably to the past. If the couple of dozen, or couple of hundred even, of scientists in Buffalo, for example, are too indolent to transform to the present system the few experiments in foreign measures which they, and in all probability they alone, desire to use, is that any reason why the remaining 400,000 people here should be compelled to change their whole system of education, almost their being, in order to set a premium on, well, it is nothing but laziness and may as well be called by that name.

Suppose that the labors of engineers and scientists generally were lightened by the use of this system, what would it amount to? What is their proportion to the public at large, and why should the labor of a few men here and there be lessened at the expense of tearing up by the roots the most fundamental feature of our commercial and industrial life? Were all the scientists and engineers of the world brought together, it is doubtful whether they would make a city as large as Buffalo. Is it another case of infant industries, or, to vary the quotation used a short time ago, "Shall the mountain go to Mohammed at last?"

Physicians study the metric-system, claiming simplicity, but they constantly study to mystify the people by calling common salt sodium chloride or natrium chloride, define water as "*aqua pura*" or "*aqua distillata*," etc., and should this system of weights and measures become general they would undoubtedly seek another, or their day of mystification would soon pass.

It is said that the naval-architect desires the metric-system because of the ease of transforming water displacement into kilogrammes, but unfortunately the naval-architect deals principally with salt water. If the Creator would kindly reconstruct the earth and fill the seas with distilled water, such argument might apply to his case.

The electrician desires it (and, by the way, the twenty-one letters from "large manufacturing firms, particularly manufacturers of machinery," that were sent to the House Committee were almost wholly from electrical-concerns) that he may express 1 foot-pound, that is, the energy required to raise 1 pound 1 foot high, by its much simpler metric equivalent of 13,562,600 ergs, a quantity in either limit beyond the comprehension of any created being, but they have shown such versatility and originality in their choice of units (and physicists, whose sole object appears to be mystification, might here be included), such as Radians, Dynes, Eggs, Ohms, Mohs, Volts, Farads, Joules, Watts, Henrys, Gilberts, Gausses, Maxwells, Oersteds, etc., such extreme readiness to assimilate the nature of a force to its descriptive name, that it is scarcely to be wondered at that they prefer, for a unit of measurement, something practically without a home and without a meaning. Electrical equivalents and formulas are among the infant industries that desire protection at other people's expense. Is it advisable to go to the necessary expense for the benefit of the electrical-engineers?

As to units of weight, which depend on the force of gravity, the result of the change will be (scientifically) to change from one interminable decimal to another. There is no unit of more universal application than that of gravity, and it is no easier for scientists to use 9.8026 metres than 32.161 feet, which, in our latitude, express that force to the same degree of accuracy. The accepted values of the dyne and erg are approximately correct at sea-level in latitude 45 degrees, but nowhere else, and if the change is demanded in weights for scientific purposes, that is, for rigid accuracy, it is "up to" science to prove why one of the above values is simpler than the other. The force of gravity defies any system of division and laughs at legislation.

The indications are that the American Society of Mechanical Engineers will be overwhelmingly against the measure, and the statement made before the House Committee that the American Society of Civil Engineers favored it is untrue. Our retiring President holds a letter from the Secretary of that Society, dated November 19, 1902, in which it is stated that the Society has never voted upon it.

What does the civil-engineer gain by it?

True, he does some work where each piece is complete and finished in itself and his unit of measurement is comparatively unimportant, therefore standing on a different basis from the mechanical-engineer, a large majority of whose constructions are subject either to constant repair or interchange of parts, yet, so long as any existing structure remains, so long will the measures in which it was built remain. Measures are tied irrevocably to the past.

St. Louis measures its land to-day by the "arpent" used by the original French settlers. Philadelphia still has its chain of 100 feet 3 inches. Texas has its "vara" (and there are a great many varas in existence), and no amount of legislation can or will change the measure that is of the past.

The exemption of the United States public lands from the operation of this law recognizes this fact, but in order to testify in court, will not their quarter sections of 160 acres each have to be referred to as measuring .804657 kilometre on a side, and having an area of 64.7474 hectares?

Take our drawings. We must choose some scale. Will it be more convenient to record 1 inch as .0254 metre, or to record 10 feet as 3,047.945 millimetres? Where will be the room for the drawing when the dimensions are put on?

Take a homely little problem in city surveying. Suppose a lot 30' x 120', on a street 66 feet wide, and suppose a sidewalk 4 feet wide, and a paved width of 32 feet. Now, shall the street be

recorded as having a width (Kater's metre) of 20.1164 metres, or 201.164 decimetres, or 2,011.64 centimetres, or 20,116.4 millimetres? Not one of us could form a conception of the width from the latter figures. But it may be said that it will be very simple to alter that street-width to 20 metres. Such alteration, however, would only involve the transference of a strip of land 5.82 centimetres wide by 9,143.835 millimetres long to every owner of a 30-foot lot, and his 30' x 120' lot would become 36.6335 metres deep by 91.43835 decimetres wide, with a legal walk 1,219.18 millimetres wide in front of it, and he would be assessed for paving not 30' x 16', but 9.1438 x 4.8767 square metres. This may look absurd, but remember, linear measures are tied irrevocably to the past, and a hundred years from now the purchaser of such a lot can demand the amount of land represented by 30 x 120 English feet of the year 1902, and obtain it, and posterity must know what that measure was.

The most difficult part of mathematics for students to grasp is decimals, and wherever possible they are avoided by business-men; and, educated gentlemen though you are, it would be perfectly safe to assert that there is not one of you who could not easily be made to stumble over this mode of calculation.

Looking over the metric-system you will perhaps be surprised to find that it is not so simply decimal after all.

The unit of length is a metre (39.37 inches by law).

The unit of solid measure is a stère and is 1 cubic metre (35.317 cubic feet).

The unit of square measure is the "are," but it is not 1, but 10 metres square (1,076.4 square feet).

The unit of weight is the "gramme" (.0022 pound avoirdupois), but it is not 1 cubic metre, but 1 cubic centimetre; and the dekagramme, or 10 grammes, is not 1 cubic decimetre, although it is 10 cubic centimetres, the cubic decimetre being equal to 1,000 grammes, or 1 kilogramme.

The unit of dry and fluid measure is the litre (.0353 cubic foot), but it is neither 1 cubic metre, like the unit of solid measure, nor 10 cubic metres, like the unit of square measure, nor 1 cubic centimetre, like the unit of weight, but is 1 cubic decimetre.

In fact, the bases of the different weights and measures are as variable as our own, and the claimed facility for theoretical transformations will vanish like the dew of the morning when brought before the light of day.

The writer has transformed a great many formulas from one system of measures to another and knows whereof he speaks.

The House Committee report also states that the Department of Education estimates two-thirds of a year saved in the life of every child by the use of the metric arithmetic. On the contrary, it would add that much more study, because measures are tied irrevocably to the past.

We may also ask, from this standpoint, How long will it take, and what will be the expense incurred, to rewrite and reprint all of our existing text-books, histories, encyclopædias, records, etc., that we may save the two-thirds of a year in the life of every child as above stated, in order that they may not be able to read the history of their native country?

To what use are our public libraries doomed?

Finally, none of you are school-children, but kindly listen to the following short table in the smallest French unit, in which the decimals are not carried beyond the accuracy now obtainable in mechanical work.

$\frac{1}{4}$ inch = 6.3499 mm.	$1\frac{1}{4}$ inches = 31.7497 mm.
$\frac{1}{2}$ inch = 12.6999 mm.	$1\frac{1}{2}$ inches = 38.0996 mm.
$\frac{3}{4}$ inch = 19.0498 mm.	$1\frac{3}{4}$ inches = 44.4496 mm.
1 inch = 25.3998 mm.	2 inches = 50.7995 mm.

Now, linear measures being tied irrevocably to the past, who of you can tell me how many metres are represented by $1\frac{1}{4}$ inches?

You have just heard the answer.

DISCUSSION.

MR. KIELLAND: We know that Germany is a very disciplinary country; that is, they introduce a measure and carry it through by Government order, soldiers. Still, within the last month, there has been introduced in the German Reichstag a motion to legalize the use of the one-half pound and one-quarter pound as part of the national system of weights, as having been found impossible to familiarize the common people with the use of that kind of unit unless divided into halves and quarters.

As Mr. Tutton said, measures and weights are not especially for scientific people, they are not for that part of the world which may be possibly represented only by the people of Buffalo, but they are for the multitudes, for the common people; and it seems to me that these people should be considered when such a measure as this is taken up. It is not alone for us who have been trained, who are able to transfer from one thing to another, who can figure in the decimal or in the duodecimal system, but for the common men; and it seems to me it is a great triumph for those who oppose the metric-system that this proposition is now before the German Reichstag.

I was born in a country where a binary system, similar to that of America to-day, pounds and feet, was changed to the metric-system. It was a "craze," when, some years ago, old nations looked to France for pretty nearly everything in scientific lines. Educated people began to think that what came from France was the proper thing to follow; and, without taking time to look into or study the matter,

the metric-system was adopted by pretty nearly all of the leading nations of Europe, with exception of the Anglo-Saxon nations and Russia.

When I went over to Norway, Sweden and Denmark, a few years ago, after having been away about twenty-five years, I found the common or old measures, as well as the metric measures, in use by the common people, especially among the traders and peasantry. The most of their trade and dealing is done by the old system, the same as they used to do before the metric-system was adopted. Of course, if we want these difficulties and complications by the use of two or more systems, which Mr. Tutton has so well pointed out, we can have them by making the use of the metric-system compulsory in the United States.

America is to-day a mighty nation. We are taking our share (pretty near the governing share, you might say, — from one-half to one-third) of the business of the world, and why should we change our system now? Let them change theirs to ours.

COL. FRANCIS G. WARD: I was brought up under the metric-system and so might differ somewhat from the gentlemen as to the application of it. I resided for eight years in a country where the people were familiar with its use. I doubt whether it is advisable to adopt it in the United States.

The standard, as made and elaborated in France, is certainly figured out as finely and as carefully as any system can be. Naturally, when you begin to compare it and translate from one system into another, you meet the same difficulties as translating from one language into another. You lose the value of any work when you translate it. You should be able to read the work in its original. If there is to be a universal system of measures in the world, and if there were a movement in all countries which would bring all measures to a uniform standard scale, metres or any other system, I believe that such universal measure should be adopted. To the people that have been accustomed to use the metric-system it would sound like heresy to say what you have said to-night about the metric-system, and I want to qualify my remarks and say that I realize the difficulties of translating one system into another. The system that we have in this country is the old English system. Good enough for us.

I do not believe there is any necessity for any change in the system of measures of the world until we have a universal measure, the same as the Postal Union, the same as we have arbitration, then the best scientists of every country should be brought together and formulate a universal system. I would not say a metric system, but I would say a universal system which could be used by the commerce of the world.

MR. GEO. B. BASSETT: I know very little about the metric-system. I think its adoption as an official standard in this country would burden the country with two systems; instead of leading to simplification of matters of weights, measures, etc., it would really complicate them. As it is now, our system of weights and measures is quite simple and readily learned, and it would be difficult to do away with it. Personally I am not in favor of the change.

MR. GEO. F. MORSE: Every one knows that the metric-system is the only lawful system in Latin countries, yet a commission-merchant in New York City exported to Porto Rico, and I believe to Honduras, a great many scales which were marked with the metric-system on one side and pounds on the other, because people in those countries knew of the English pound; but there was this peculiarity about those scales, the Government inspectors only inspected the metric-system, while the pounds were equivalent to about twelve ounces of American pounds!

COLONEL WARD: A man in France, selling by kilos, gets the advantage in weight over an American who buys by pounds, and it is to their advantage to keep up a difference in the measurements and weights. It is a commercial proposition and I believe it will be difficult to get over it.

MR. TUTTON: I am fairly familiar with foreign sciences, and it is science that particularly demands this change. Now, any one reading foreign scientific books will find that they practically reduce all units to three divisions, the unit and the thousands. The kilogramme, gramme and milligramme, the kilolitre or cubic metre, litre and millilitre, etc. They recognize between these nothing to speak of, and while it is easy for a scientist to say one one-hundredth and one one-thousandth, when you come to the people, they are not in it. They are not educated to this point and you never will be able to educate them to it.

Fancy a woman asking for a thousandth part of a kilogramme of something, or even a hundredth. She might be educated to know what a dekagramme or hektogramme is, but she could never be educated to know what the one one-thousandth of a kilogramme is. There is no objection to scientists using this system, if they find it convenient, but because scientists want it, don't saddle it on the common people. Scientists are too few in number.

VICE-PRESIDENT NORTON then spoke about the uncommon units of English measure, like the measurement of "finger lengths" in knitting, and of knots and skeins, as well as many other measurements in common use throughout the country.

Mr. Norton then continued as follows: Any change which we might adopt officially would, with the common people, have no effect

for a long time, but that is not a question which should be brought into this argument. The fact is that these systems are slow of change and are changed only after the lapse of generations. It is a question whether or not to-day the metric-system is more convenient and better for use and can be adopted with less inconvenience to the people than some other whereby we may arrive at a universal system. It is a question of the merits of the system. I do not doubt that we are coming in the course of time to some universal system of measurement. Whether it is going to be the metric-system or some other, I think it is too early in the discussion of the subject for any one to say, and it would seem to me that the time has not arrived yet for the United States to change, but it may be desirable. The question has not been sufficiently considered as to whether that is the easiest and best, and in the end most satisfactory method of arriving at a universal system of measurement.

THE PRESIDENT: Mr. Herbert Spencer wrote a letter (which is printed in his miscellaneous writings) to a Member of the House of Commons of the English Parliament, who was Chairman of the Committee who had in charge a bill similar to our present H. R. Bill 123. In this letter Mr. Spencer stated that although the metric-system was used by the Latin nations of Europe and America, yet that in all of North America, with the exception of Mexico, in all of the British Empire and in all of Russia, the countries comprising one-third of the land-area of the globe, they did not use the metric-system, and he also stated that Anglo-Saxons and Russians manufactured more than two-thirds of all the manufactures of the world, or of the civilized nations.

In bringing this matter before the Society at the present time I did not have in mind the discussion of the metric-system itself, but I desired to get an expression of the views of the members as to the necessity of passing the bill now before Congress, without any discussion thereon by the people at large, or without any demand for it coming from any State or municipality.

In order to find out the present status of the bill, I addressed a letter to Hon. D. S. Alexander, one of our Members of Congress, who in turn wrote to the Hon. J. H. Southard, Chairman of the Committee on Coinage, Weights and Measures. I will read you his reply: —

TOLEDO, OHIO, October 29, 1902.

HON. D. S. ALEXANDER, BUFFALO, N. Y.: —

My Dear Alexander, — I have yours of October 27, and will say that at the last session of Congress a bill providing for the adoption of the metric-system by the departments of the Government was reported favorably to the House and is now on the calendar. It does not affect the general public otherwise than indirectly through the departments of the Government. If the bill becomes a law the different departments will be required to establish the weights and measures of the metric-system in all Government transactions after the first of January, 1904.

Very truly yours,

J. H. SOUTHARD.

During the discussion of this bill last summer by the Western Society of Engineers it was stated that Members of Congress wished to have the opinions of "civil-engineers and other practical men" on the subject.

It will be noted that Mr. Southard says that this bill does not affect the general public otherwise than indirectly, etc., a statement which seems to be contradicted by the wording of the bill itself. If Members of Congress would like to have the opinion of "engineers and other practical men," they should invite discussion on the subject by the common people, but no such discussion was had, to my knowledge, in any Congressional district during the recent political canvass.

MR. BASSETT: I think before such a radical change is made, it should be submitted to popular vote, like a change in the Constitution of the United States.

MR. KIELLAND: It seems to me that the utterances we have heard to-night are a pretty fair indication of the general opinion which would prevail in the United States if this matter was brought, as it should be, to the full hearing of the American people. This is not a matter which should be passed on by a few scientific bodies. The American people should have more to say, should have more chance and time to decide a matter of such vast importance as changing the weights and measures. Therefore, I advocate a motion that our Members of Congress have from this Society an opinion that we think that the matter is untimely; that it has not been sufficiently discussed throughout the country, and that its passage, without such discussion, would be premature.

SAND-LIME BRICK.

AT the Seventeenth Annual Convention of the National Brick Manufacturers' Association, held in Boston in the latter part of February, the following interesting discussion took place: —

PRESIDENT EISENHART: Let us take up the next question, No. 37: "Do the various United States patents on artificial sandstone brick cover the mixtures of lime and sand, or the process of manufacture, or only the kind of machinery used?"

MR. EUDALY: We would not know unless we examined the patent-office reports.

S. V. PEPPEL, COLUMBUS, O.: Owing to the lateness of the

hour, I will answer this question, No. 37, as briefly as I can. It cannot, however, be answered as a whole. There is a United States patent which covers a mixture. The patent covers the kind of lime which is used, and covers everything which is protected by patent for any other lime. Then there is another one in which machinery, or, rather, a process, is covered, i. e., the introduction of chemicals, and another one in which the process and machinery as well as the method are patented. The sand is dried and the lime is added and mixed in a certain manner, and the same patent covers the machine by which this is brought about. Then there is another one that cannot be classed either as a machine or as a process; it is the introduction of chemicals into the cylinder. This process promises that the very stable chemicals, potash and soda, which are introduced into the cylinder, are vaporized and carried into the brick by the steam. There is another one by which hydrochloric acid is introduced in the original mixture. This probably should be classed with the first one. However, I do not believe that hydrochloric acid is used either in this country or Europe. I think it has been abandoned. As I said before, there is one patent which concerns the machinery and one the process.

I had better say here the process of holding the brick under high-pressure steam in the cylinder is not patented in this country, nor can it be. The patent has been abandoned in Europe, so it has been public property for many years.

I will now take up the next question, No. 38, "How many systems are there, wherein do they differ and which possesses the most commendable points?" There are five systems represented in this country and more in Europe. One system, the Kleber system, which uses hydrochloric acid, is the system which was used at the plant in Michigan City, Ind. There is another one, that of H. C. Brown, at Coldwater, Mich. They use dolomite or white lime, and there will be a plant in operation by the first of April at Jackson, Mich. The machinery has been contracted for. The next system represented is that of the American Sandstone Brick Company, Saginaw, Mich. They are operating according to the plan of F. Komnick, of Germany. Their plan differs from the others in this: They partially slake their lime in small iron vessels, which are afterwards placed under the cars in the hardening-cylinder and the slaking completed in steam. Another process is that exploited in this country by Huenneke & Company. This process consists of a pan, or cylinder, within the hardening kettle, or cylinder. The patent calls for potash and soda in the pan. The other system, known in this country and Europe as the Schwarz system, consists in the use of a vacuum in treating sand and lime to dry it prior to adding water in definite amount, and also for expelling the air during the mixing process. Aside from this they use machinery the same as the others. They use but the one special machine; the mixing-machine and the vacuum-apparatus are one and the same.

The next part of the question, wherein do they differ, I do not think would be right to discuss in this Convention. I think it is contrary to the aims and objects of this Convention to take up such a subject; neither should we discuss the last part of the question, as to which system possesses the most commendable points.

Now No. 39, "What are their frost-resisting qualities?" In making the tests of the brick made by us by no special system, we subjected them to a very severe freezing-test, which consisted of soaking the brick thoroughly, immersing them in an ordinary ice-can at the ice-plant, where the temperature was about twelve degrees Fahr. They were frozen through, taken out of the can, thrown into warm water, completely thawed out, removed from the warm water and at once put into the freezing-can again. This was repeated twenty-one times. Then the brick were tested for their tensile-strength and crushing-strength. These latter results were compared with those obtained on similar materials immediately after being removed from the hardening-cylinder. The only case of failure was the brick which contained twenty per cent or more of kaolin or clay. They showed weakness after the freezing-test, the others showing an increase in strength. This increase was not, however, due to the frost, but to the recarbonization by the carbon-dioxide in the water in which the brick were thawed out of the lime which had remained as free lime, and, of course, increased the strength of the brick.

The next part of the question is: "How will they stand in a climate like Boston?" They will stand all right, if you can judge anything by the severe freezing-test we gave them. You have nothing here more rigorous than that. You have a moist climate and numerous temperatures, but there will be nothing like the conditions to which they were subjected in the tests.

The last part of the question is: "Will lime slake in an air-tight cylinder?" That depends. It will if you add water to it; and I will say this, if there was much lime in an air-tight cylinder and water was introduced, I would just as soon be in some other neighborhood. (Laughter.) There is no doubt that the lime will slake.

PROFESSOR ORTON: The fact that I have been employing Mr. Peppel for the past year and a half to work up this sand-brick question for the Ohio Geological Survey, and am now preparing to publish a book on the subject, shows pretty clearly that I think there is something back of it. I would not want to spend the State's money unless I did. However, I have only looked into the matter so far through Mr. Peppel's eyes. He has been all over the country looking into these things, and has reported what he has found. My opinion is that there are large districts in this country where the sand-brick will be a success.

Whether it will be so everywhere I am not able to state. But one thing is sure, you can make a very durable, sound and well-looking brick by the sand-process, and, I think I am right in saying, at a comparatively low cost.

A MEMBER: How about the crushing-strength?

PROFESSOR ORTON: We have had tests made and they stood a test of about 8,000 pounds to the square inch.

MR. PEPPEL: While we made brick with crushing-strength of 8,000 to 8,500 pounds per square inch, we do not consider it a good commercial proposition to manufacture sand-brick of that strength. In the light of the last year's work, we believe it to be entirely feasible to manufacture for the market sand-brick with crushing-strength of 4,000 to 5,000 pounds per square inch. The strength of the sand-brick now on the market varies from 2,300 to 3,300 pounds per square inch. A crushing-strength of 2,500 pounds per square inch is strong enough to answer all requirements and leave a very large factor-of-safety.

MR. J. C. ADAMS: I had not intended to say anything on this matter for the reason that I am not at all conversant with the conditions under which sand-brick are made. I can only relate what has come under my observation in connection with sand-lime brick. A building was erected in our city during the past year which was to be faced with these brick. They were piled on the ground, when they crushed of their own weight. They started to use them in the pier-work of the first story. When the pier was half completed the brick cracked and went to pieces and crushed of their own weight. I took one of the brick home with me, put it in a bucket of ice-water and the next morning the brick was at the bottom of the bucket entirely disintegrated. However, I do not wish to be understood as condemning a method or process which I know but little about, and only give this as my observation.

S. E. FRANK, NEW YORK CITY: Will you kindly tell me where the brick were made?

MR. ADAMS: They were made at Michigan City, Ind.

MR. PEPPEL: I was there a year ago, and they had built a two-story building with these same bricks. The building looked well at that time. I was there a few weeks ago, and I went to see that same building, with the view of finding any flaw that I could. I looked for evidence of the action of frost or the appearance of scum, or anything of that sort, but I was unable to find anything that would justify me in condemning that building. Of course, in the manufacture of sand-brick it may be possible to make poor brick, the same as it is to make poor brick of clay occasionally. When once people know how to manufacture sand-brick there is no occasion for failures in strength.

MR. ADAMS: These bricks were shipped from Michigan City to be used in what is known as the Wood-Weaver Building at Indianapolis. They were rejected and removed from the ground, and the building was faced with a buff pressed brick.

WALTER HAYES, DETROIT, MICH.: I would like to ask some man from Pittsburgh what he thinks of sand-brick. They are using them there.

L. J. KWIATROWSKI, NEW YORK CITY: This is comparatively a young industry in this country. However, it is not so young in a country like Germany. You gentlemen are losing the effects of the discussion. The fact exists that you can make as poor a sand-brick as you can a clay-brick, and the fact also exists that you can make as good sand-brick as you can clay-brick. The difference lies in the material and the treatment it receives. If you will take clay that will not burn, it will not make good brick. If you take material that cannot be bound, you cannot make good sand-brick. This industry is assuming enormous proportions in Germany. There are now in existence 180 factories, with an annual production of over 320,000,000 bricks. These are statistics. It has sprung up in a period of four or five years, beginning in the year 1896 with five factories. We have now, in the year 1903, over one hundred in Germany alone. The fact is that the German Government itself is employing these bricks in Government buildings. They are using 9,000,000 bricks alone in the neighborhood of Berlin, in the building of baths. There is another fact that I want to bring out. There are firms in this country who have brought kilns and machinery to perfection by constantly working on them and improving them. Just the same way, there are firms making it their business to improve on plants. We cannot adopt the German methods here; the labor conditions are different. First, we use more machinery. And when it comes to machinery we can say to the parties here we can give foreigners ace and spades and beat them out. Therefore, we must adapt the German methods to what we have in this country. In other words, we must adapt the machinery, which can be built here so successfully, to replace the laborious German methods, for American methods constantly economize in labor. I make one prediction, that if it is possible for such an industry to spring up in so conservative a country as Germany, where the building-laws are very strict, what will happen in this country will be beyond our expectations. There is ten times as much building going on here as in Germany. There are numerous tracts of land where there is no clay at all, or at best, only

very poor clay. Now, we are using ten hours of time making these bricks, we are using half the fuel you are using, and we are using one man where you are using two. If you will make yourselves acquainted with the facts, you will find that this matter deserves your honest and earnest consideration. Gentlemen, think of it. (Applause.)

MR. KUTSCHE: I would like to ask the gentleman what he knows about the Pittsburgh plant. I understand that it is now in operation, and I would like to know what he knows about it.

MR. KWIATROWSKI: The Pittsburgh plant is now being operated successfully. Only last week there was placed with the Pittsburgh factory the largest order for sand face-brick that has ever been placed in Pittsburgh, one million face-brick. They only began operating in October, and the fact is they are selling more brick than they can turn out. And it might be safe to say right here that they are not by any means producing the brick which they can produce, because they have not a first-class equipment. They started it as a sort of an experiment. One of the gentlemen went to Germany and saw these sand-bricks and he came home and formed a little company, and then went out and bought second-hand machinery and everything else as cheap as he could, and they are producing salable brick. But they are not producing as good brick as the factories are which are constructed and run as they should be. Otherwise the success is assured. Permit me, Mr. President and gentlemen, to come back to the brick at Michigan City. I know the fact that at Michigan City they have sold up to date in the neighborhood of 6,000,000 bricks. I have a photograph of a building which has been erected there, made of these bricks, and it is a good building. There was a time when the people knew nothing about the manufacture of these bricks, and had no experience in the erection of a factory, and they turned out a lot of bad brick, an awful lot of brick. Just such a mess as may be found when a clay-brick factory is started and some one makes a blunder; and, of course, these brick have been lying around the factory. This man had no experience and he didn't want to pay a man who had had experience, so it cost him in the neighborhood of \$20,000 more than it should to get a factory started. I know these bricks were picked up by several people who came along to see, and said to the owner: "Won't you sell me these bricks?" And he said, "These bricks are no good." And the fellow said he was going to build a little place, and took them anyway. These bricks were poor bricks, but, as I have said, this man had never erected a factory before, and he didn't want to employ efficient help, and he turned out poor brick. To-day he is making good brick. They are being used, to my knowledge, in Chicago. He is running to a capacity of 50,000 brick per day and selling every one of them.

MR. HAYES: What does Mr. Will Purington know about these sand-bricks?

MR. WILL PURINGTON: I don't know anything much about it. I was in Kansas City not long since, and men were working to get capital to organize a company. I was at the Diamond Brick Company. They have a testing-machine, and I happened to be there the day they tested some sand-brick. I have understood since that these bricks stood a very low test, only about twenty-five per cent of the strength of vitrified brick.

MR. FRANK: I would like to say, so far as the testing of sand-and-lime brick is concerned, that the bricks have been thoroughly tested over in Europe. The question of its ability to stand the necessary tests has been thoroughly demonstrated by the fact that they are building public buildings of them. Such a test was made at the Heidelberg laboratory, and I have the report of the test here, which I will be glad to show to any gentlemen who may be interested.

PRESIDENT EISENHART: I would like to ask you, Mr. Frank, what system you refer to.

MR. FRANK: I am connected with the Schwarz system, but my remarks above were for sand-lime brick in general. In reference to the brick in Michigan City, that plant was working under a system which had been condemned in Germany. To my knowledge this system has since been changed, and the owner is now using a system which has no chemicals in the manufacture of the product. However, he is not using my system. He is turning out 50,000 good brick a day.

MR. ADAMS: I am not here to condemn sand-brick. The time may come, and possibly is not far distant, when the manufacture of sand-lime brick may be a success and be used largely in the building construction of the country. I will say, however, that these bricks from Michigan City were not made by any old-time process, but were of a recent date, made within the last four or five months, and were shipped to Indianapolis last summer.

MR. HAYES: I would like to ask Professor Orton if these bricks which he tested, and which the freezing-test made denser and stronger, if they were made in Germany or America. I would like to know something about the brick made in this country.

MR. ADAMS: I saw sand-lime brick when in Germany, and they seem to stand well.

MR. PEPPEL: I wish to say here that the work I have done and

the questions which I have answered have been entirely from a disinterested standpoint, a purely scientific investigation. The brick tested were all made by myself in the laboratories of the Ohio State University, where we have a small plant built for that purpose, and the brick were all made and the tests were all made without connection with any firm in this country or any other. All those who attended the Ceramic Society meetings earlier in the week will understand the scope of the work.

MR. DEJOHANNIS: I would like to ask a question of Mr. Peppel as to whether he does not think that the great boom that has been given to these sand-lime brick in Germany is not undertaken by the Government as a means of solving the labor-problem?

MR. PEPPEL: I am not sufficiently conversant with the conditions to answer that question in a positive manner. I do not, however, believe that such is the case.

MR. KUTSCHE: I would like to ask Mr. Peppel if he used any acid in his system?

MR. PEPPEL: I used no acid, and the bricks which I made are no infringement on any one's patent.

PROFESSOR ORTON: Mr. Peppel hasn't any system to advocate. He has been purposely investigating this subject to find out the lines which a successful manufacturer must follow. He has purposely tested it technically to see the actual scope under which success can come. His report, when finished, will show this.

MR. HAYES: A company has been formed at Detroit, and we are wondering how long we are going to remain in the brick business, and if the brick at Pittsburgh have been tested and shown to be successful, Mr. Wolf and the rest of us might have to eat snowballs next winter. If these bricks stand a good test and are actually sold on the market, the rest of us had better get in another business.

MR. FRANK: I would like to tell Mr. Hayes that the bricks made in Germany were tested and have shown a crushing strength of 2,700 pounds to the square inch. I tell this to Mr. Hayes, so in case he is thinking of going out of the business, he can make preparations to make sand-brick.

MR. KWIATROWSKI: I would like to have Mr. Peppel tell me if he can what particular system this factory at Michigan City is working under?

MR. PEPPEL: They told me they are working under the right of the Kleber system, and I am satisfied, however, that they are not using any chemicals in their brick. — *The Clay-worker*.



KANSAS CITY CHAPTER OF THE AMERICAN INSTITUTE OF ARCHITECTS.

AT a regular meeting of the Kansas City Chapter of the American Institute of Architects the following-named committee was appointed to prepare resolutions on the death of Mr. Henry Van Brunt: Adriance Van Brunt, William W. Rose and George Mathews, who submitted the following:—

Whereas, This Chapter has learned with regret of the death of Mr. Henry Van Brunt, who had long been a member, its honored President for several years, and President of the American Institute of Architects for the year 1899, therefore,

Be it resolved, That the Kansas City Chapter of the American Institute of Architects hereby desires to express its sincere appreciation of his scholarly attainments, gentlemanly qualities, sterling worth and professional ability, and that we, in common with the profession at large, deplore his loss and extend our sincere sympathy to his bereaved family, and

Be it resolved, That these resolutions be printed in the *American Architect*, the *Inland Architect* and local papers, spread upon the minutes of the Chapter, and a copy forwarded to his family.

ALBERT TURNEY, Secretary.



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

UNITED STATES POST-OFFICE, ABERDEEN, S. D. MR. JAMES KNOX TAYLOR, SUPERVISING ARCHITECT, WASHINGTON, D. C.

DETAILS OF THE LIBERAL ARTS BUILDING FOR THE LOUISIANA PURCHASE EXPOSITION, ST. LOUIS, MO. MESSRS. BARNETT HAYNES & BARNETT, ARCHITECTS, ST. LOUIS, MO.

EXTERIOR ORDER: MAJESTIC THEATRE, BOSTON, MASS.

PROSCENIUM-BOXES: MAJESTIC THEATRE, BOSTON, MASS. MR. JOHN GALEN HOWARD, ARCHITECT, NEW YORK, N. Y.

THE working-drawings of this interesting building were published in our issue for January 4, 1902, while a fairly full illustrated description of it can be found in our *Trade Supplement* for March 7, 1903, from which it will be patent that the Sleep, Elliot & King Co., of Boston, who kindly send us this photographic view, are to be credited with the ornamental plasterwork. Mr. J. M. Wood, originally associated with Mr. Howard, withdrew from the undertaking at an early stage of the operations.

Additional Illustrations in the International Edition.

THE HÔTEL DE PARIS, MONTE CARLO. M. CHARLES GARNIER, ARCHITECT.

HALF-TIMBER HOUSES, WERNIGERODE, SAXONY.

This plate is copied from *Blätter für Architektur*.

FRONT AND REAR VIEWS: LIBERAL ARTS BUILDING FOR THE LOUISIANA PURCHASE EXPOSITION, ST. LOUIS, MO. MESSRS. BARNETT, HAYNES & BARNETT, ARCHITECTS, ST. LOUIS, MO.

THE MAJESTIC THEATRE, TREMONT ST., BOSTON, MASS. MR. JOHN GALEN HOWARD, ARCHITECT, NEW YORK, N. Y.



SCULPTURES FOR THE THIERGARTEN, BERLIN.—The German Emperor has provided work for another band of sculptors in the decoration of the Tiergarten in Berlin. As its name indicates, the Central Park of the Prussian capital was originally a place for deer and other game. The Emperor proposes a scheme suggested by the name. According to the *Lokal Anzeiger*, the central part of the park through which the broad avenue runs that connects Unter den Linden with the flourishing suburb of Charlottenburg is to have in its midpoint a colossal fountain celebrating Saint Hubert, patron of the chase, and his remarkable adventures. Semicircular benches will be provided round about, and on the edges of the square will be marble monuments depicting various methods of hunting in various climes and at different epochs. It will be a zoological collection in marble, interspersed with figures of famous huntsmen before the Lord, from Nimrod to Emperor Wilhelm I, whom his grandson has recently classed, with Luther, among those who have done most for religion in their day. The Zoological Garden is not far from this point, so that the sculptors will have a large number of their models for wild animals near at hand. The scheme is a comprehensive one, and offers a wide range of subjects. — *N. Y. Times*.

FRENCH ACADEMY ART SCHOOL CENTENNIAL FETES.—It will be one hundred years ago next month since the French Academy Art School in Rome was installed in the Villa Medici, after leaving its old home in the Mancini Palace. To commemorate the event there are to be artistic fêtes held simultaneously in Rome and Paris. In Rome the French colony will welcome all the former students who are able to make the journey to Italy, while those who are prevented by age from leaving France will hold a meeting in Paris, at which M. Loubet and the Minister of Public Education will preside. The sculptors among the former pupils are at work upon a bust of Savée, the Director of the School from 1791 to 1807, who was chiefly instrumental in obtaining the Villa Medici. The bust will be placed in the garden of the villa. M. Vernon, the noted medallist, has been commissioned by the Government to prepare a medal for distribution among all the old winners of the Prix de Rome, the art-prize of the Academy which entitles a French student to the course of study in Rome. — *N. Y. Evening Post*.

HOW WASHINGTON IS LIGHTED.—Congress regulates the lighting of the streets of Washington, and the appropriation bill for the fiscal year 1904, which has just become a law, makes a total appropriation for this purpose of \$289,000. This includes \$80,000 for electric-lights, at not more than eighty dollars a light, to burn from fifteen minutes after sunset until forty-five minutes before sunrise. The remainder, or \$209,000, is for gas and oil lamps, for which the price is limited to twenty dollars for each gas-lamp and twenty-four dollars for each oil-lamp, including lighting and maintenance. The street-lighting of the District of Columbia is not done by a municipal plant, but by private concerns. There is one gas-company and one electric-lighting company in the District of Columbia, and the price established is a compromise between the desires of these companies and the will of Congress, the latter having arbitrary power in the matter. Each electric-light is required to be of at least 1,000 candle-power, and each gas-lamp of twenty-two candle-power. Each street gas-lamp is required to be equipped with a self-regulating burner and tip, so combined and adjusted as to secure under all ordinary variations of pressure and density a consumption of five cubic feet of gas an hour. There are few oil-lamps in use, these being in suburban streets where gas-mains have not yet been laid. There is no competition, so far as bidding for the street-lighting contracts in the District of Columbia is concerned, there being only one lighting-company. — *N. Y. Tribune*.

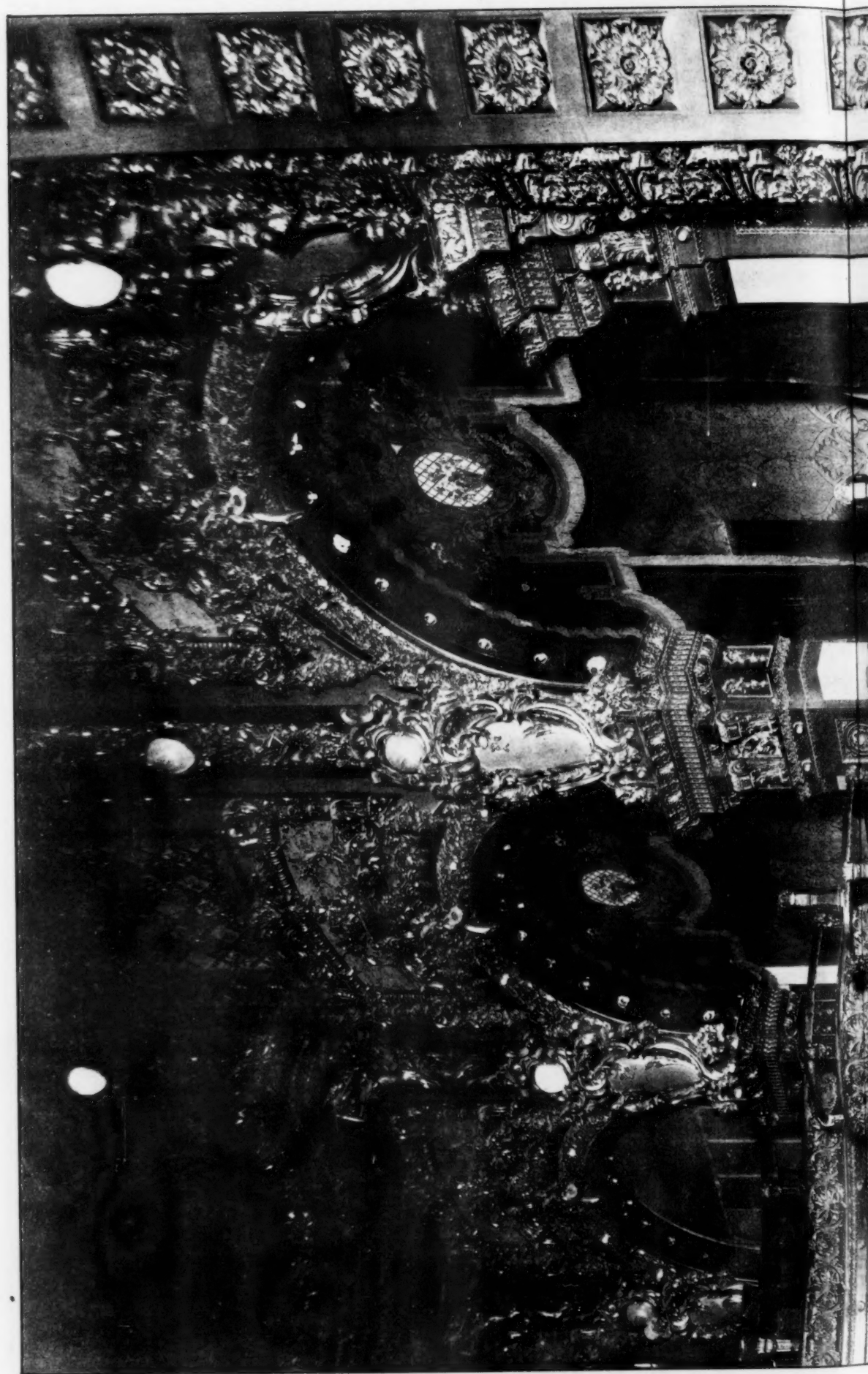
POSTPONEMENT OF THE INTERNATIONAL ARCHAEOLOGICAL CONGRESS.—It has been practically decided that the great International Archaeological Congress, which had been called to meet in Athens some time

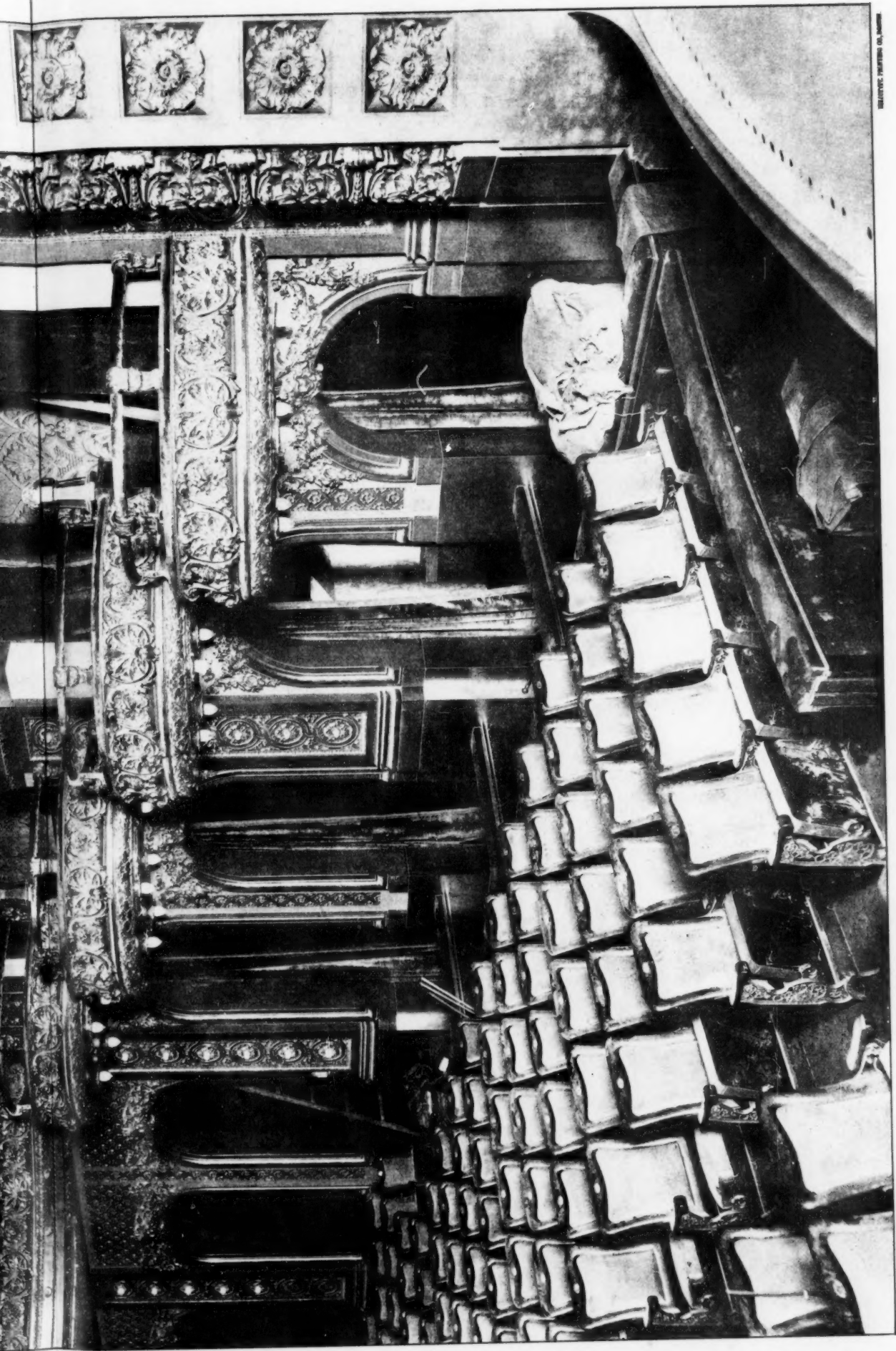
during the present year, will be postponed for at least twelve months. The Greek Archaeological Society, which has the whole matter in charge, has come to the conclusion that the preparations for the convention will require more time, as these include such important undertakings as the restoration of the temple at Phigalia, of the Lion of Charonea, of the Erechtheum, as also the renovation of the temple district of the Olympian Jupiter in Athens, and the completion of the diggings begun in Samos and several other localities. Some of these projects may consume even two years, and the President-elect of the Congress, Crown Prince Constantine, is to decide upon the exact date of the meeting. — *N. Y. Evening Post*.

THE ACTUAL REBUILDING OF THE TOWER OF ST. MARK.—After a world of discussion in the press and in private as to the persons responsible for rebuilding the grand Campanile of Venice and whence the cost of rebuilding shall be drawn, the following is settled: The Italian Government agrees that the municipality, not the Basilica of San Marco, shall take charge, provided an architect of unquestioned ability shall conduct the matter. The Government will contribute \$100,000. The municipality will give \$100,000. Together with the \$300,000 collected from Venetians and foreigners, the goodly sum of \$500,000 is assured, which is about five-sixths of the amount estimated as its cost. The Government also will appropriate \$60,000 for other restorations, such as the Procuratie Vecchie and the Sansovino Library. The architect will be Commendatore Luca Beltrami, who restored the west front of the Cathedral and the old castle of the Sforzas at Milan. Signor Gaetano Moretti has been placed at the head of the Office for the Conservation of Monuments in Italy. Commendatore Boni declined the position given to Beltrami because of his work on the Roman Forum. Beltrami's assistants are Signore Corti and Francesconi. All the rubbish having been cleared away, it is proposed to set the new foundation-stone on the day of Saint Mark, April 25, with all the usual rejoicings, peals of bells, and processions. — *N. Y. Times*.

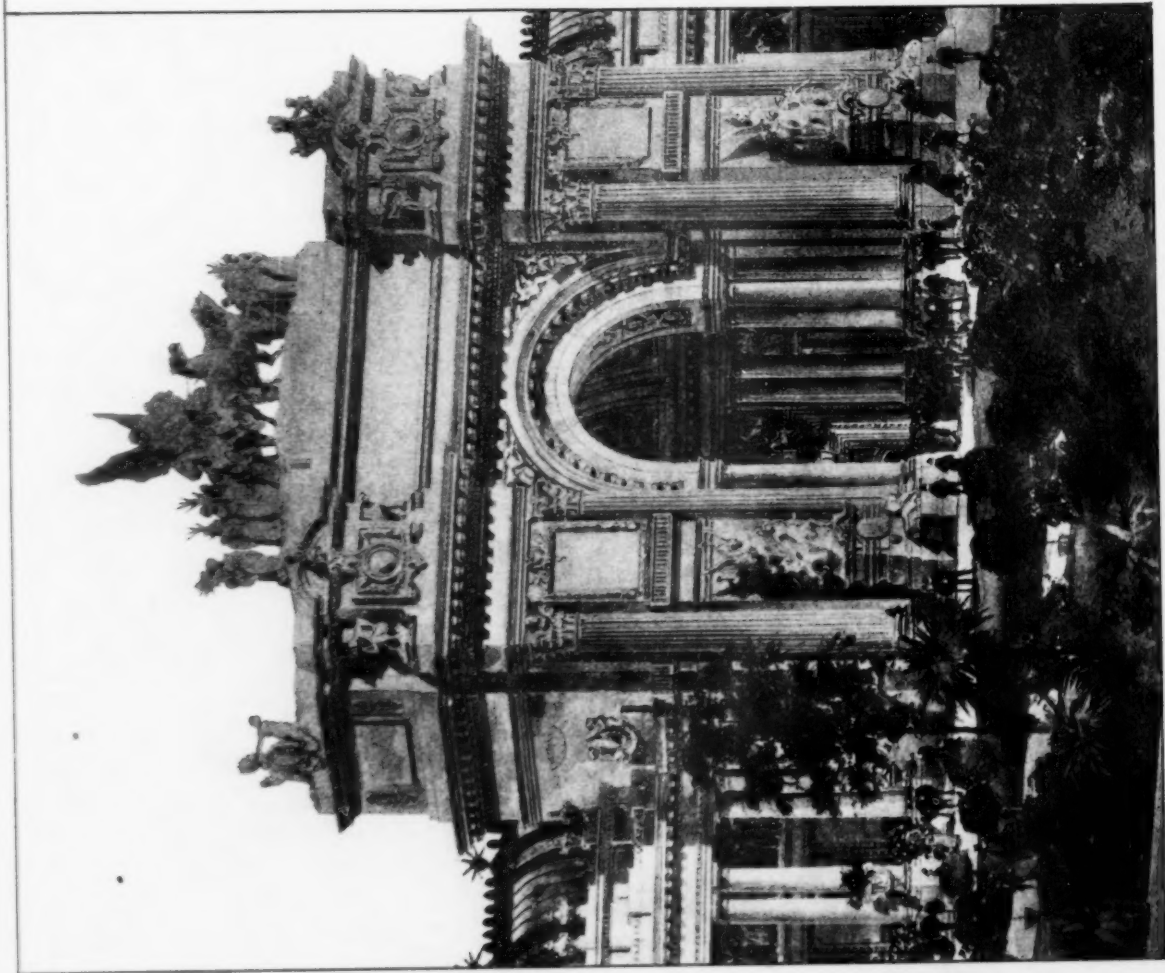
THE BALTIC AND BLACK SEA CANAL A PROBABILITY.—A correspondent of the *London Standard*, writing from Odessa, declares that there is good authority for the rumor that the Baltic and Black Sea Canal project will be undertaken before long. The strategical advantages of a sea-canal permitting the passage of the heaviest warships between the Northern and Southern Seas are, of course, obvious. The distance from the proposed Baltic mouth of the canal at Riga to Kherson, on the Euxine estuary of the Dnieper, is about eighteen hundred versts, or twelve hundred miles. The engineering difficulties are not considerable. The deepest cuttings will not exceed six or seven fathoms, and there is, practically, no rock to be dealt with. Excluding the great river and lake sections, there are only about fifty versts of actual canal excavation to be made, all the rest of the heavy work being done by dredgers. About ten locks will suffice for the whole route, and those are made necessary by the fall of the river and lake levels in the autumn and their rise in the spring. The Imperial Government, says the correspondent, has accepted the scheme in principle, but there are still some formalities to be executed before the concession is finally granted to the Anglo-Russian syndicate which is to do the work. This organization is to have command of a capital of twenty-four millions sterling, while the estimated cost is about eighteen millions sterling. But estimates on an enterprise of this sort in Russia are apt to be misleading.

STONELEIGH COURT, OR LOOK BEFORE YOU LEAP.—Stoneleigh Court, the finest apartment-house in the national capital, representing an investment of \$1,000,000, is nearly ready for its roof, and, although it will not be habitable before November, more than half of its suites have already been leased at hitherto unheard-of rates, and its owner is at last enabled to secure some definite idea of his prospective returns. Several nights ago Mr. Hay read a little homily to a few friends from his own experience on the uncertainties of real-estate enterprises. When two years ago, he told them, he was induced to embark in the semi-benevolent undertaking of supplying Washington's wealthy temporary residents with a luxurious winter home, his real-estate advisers had figured out a guaranteed return of twelve per cent on the capital involved. With this attractive proposition he began quietly and through various agencies to purchase the necessary land in the social centre of the town, and as all of it was improved by substantial dwellings, fancy prices had to be paid in many instances. When the title to the huge block was finally secured with an expenditure considerably above the original estimate, it appeared that there was still an assured profit of ten per cent in sight. But it cost much more to clear the ground of its buildings than calculated, and a market for the salvage failed to materialize, so, with the vacant lot and the drawings and specifications on his hands, the certainty of eight per cent interest was about all he could figure out. Then followed the discovery that the site had originally been a morass, that it was filled with ashes and tin cans, which were a fair foundation for three-story dwellings, but that concrete 40 feet deep was indispensable for the security of the enormous structure which was essential to produce an income of even six per cent on the total outlay. With the tedious delays inseparable from making the foundation firm came the abnormal rise in building-materials, and when the contracts were awarded the revised calculations gave no positive assurances beyond an earning power of four per cent. Now there has come a reassessment of values under the new tax-laws, while many unavoidable "extras" for the interior finish and furnishings are arising, and innumerable little unanticipated details, most of them patently desirable, though not absolutely indispensable, are suggesting themselves, so that the Secretary of State wonders whether the same amount invested in Secretary Shaw's new refunding two-per-cents would not have been safer and altogether more enjoyable in the long run. — *N. Y. Tribune*.

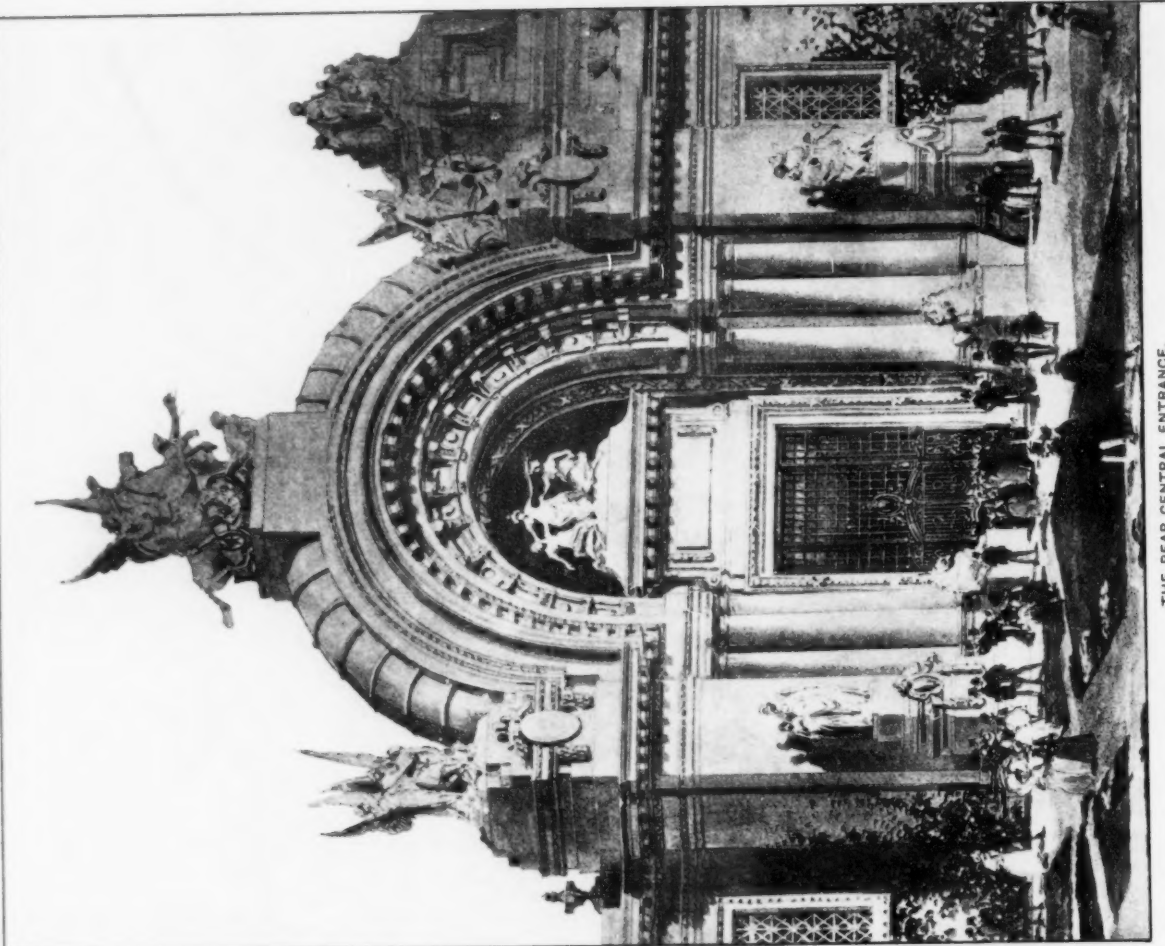




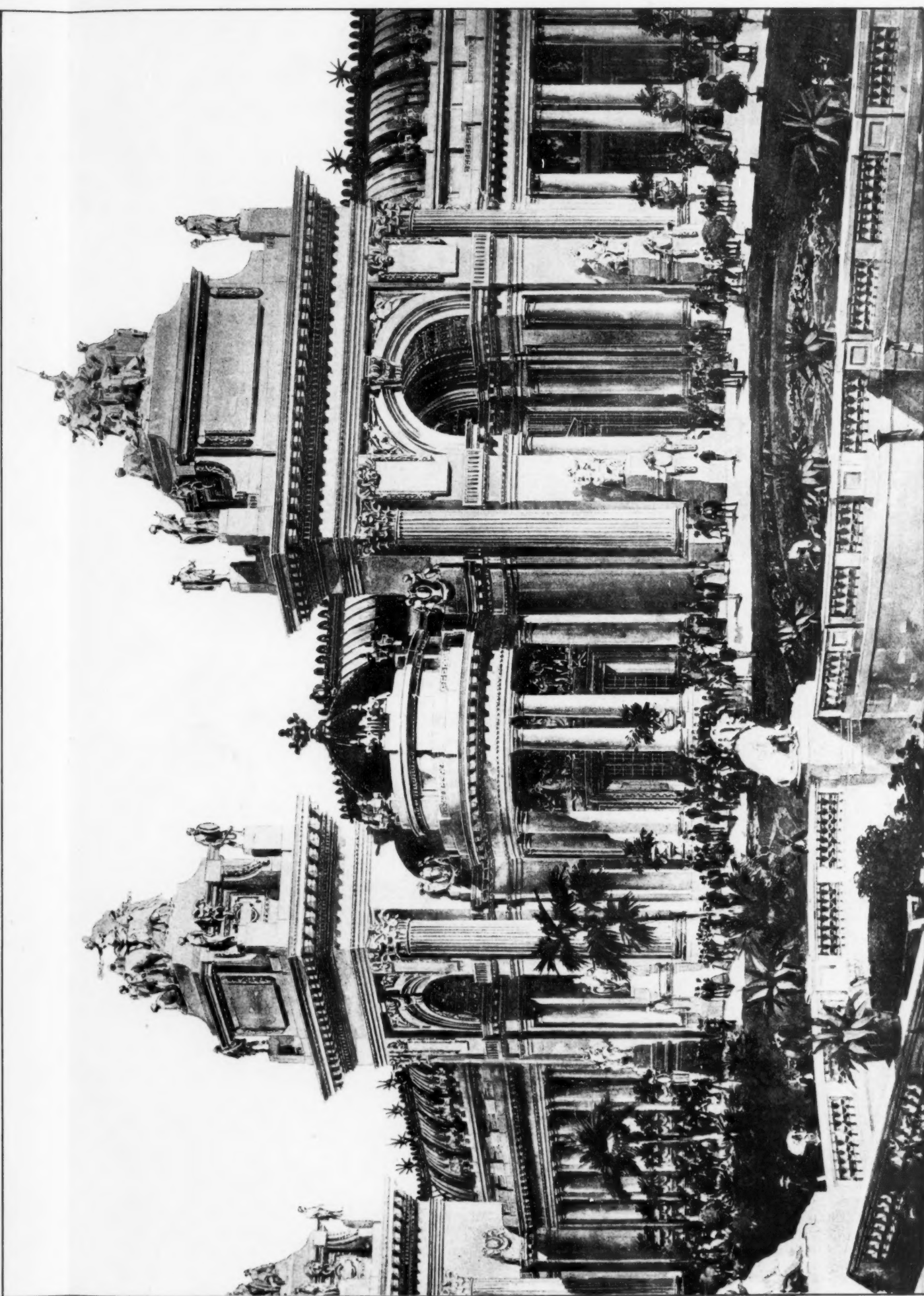
PROSCENIUM BOXES: MAJESTIC THEATRE, TREMONT ST., BOSTON, MASS.
JOHN GALEN HOWARD, ARCHITECT.



MAIN FRONT ENTRANCE.



THE REAR, CENTRAL ENTRANCE.



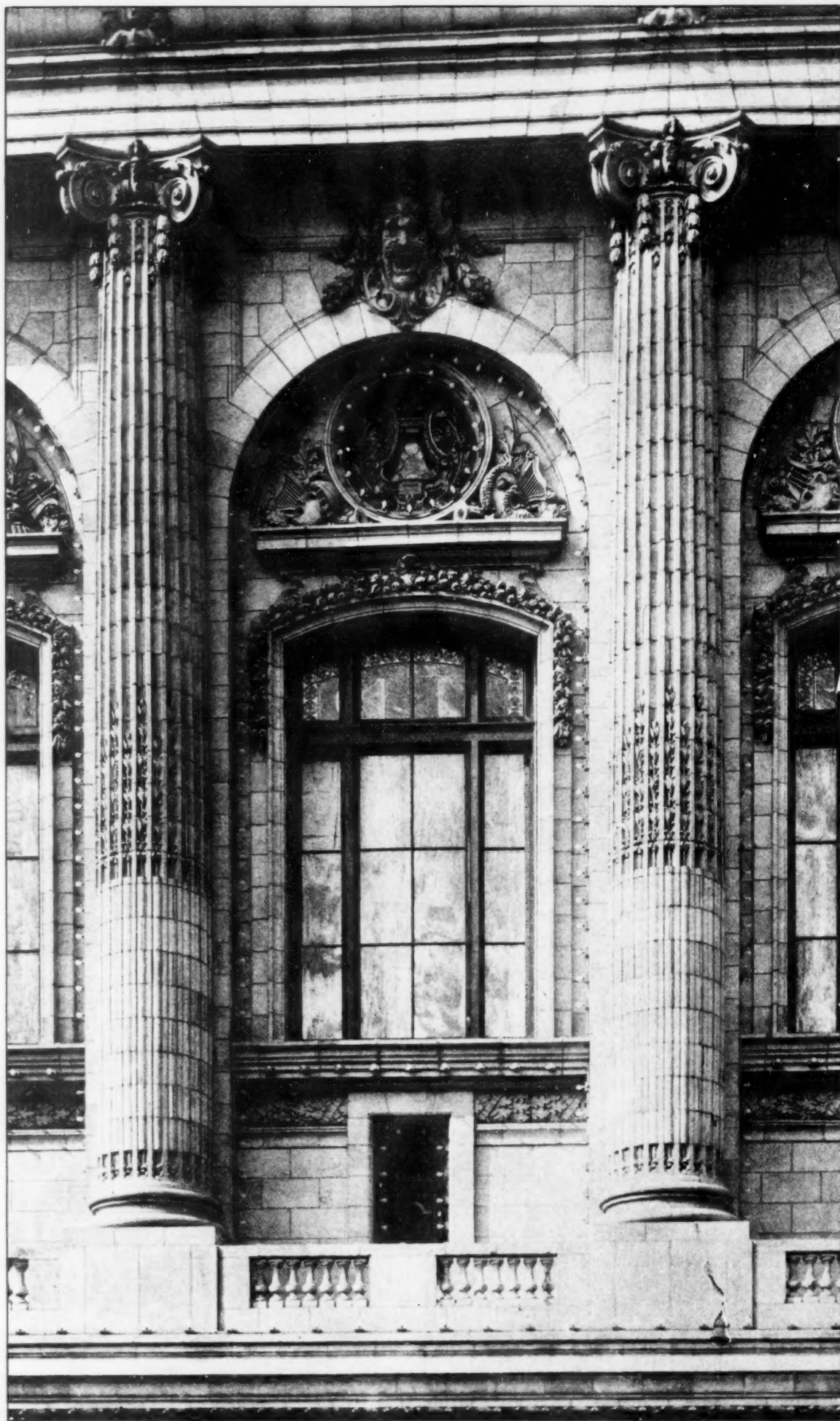
LIBRARY OF THE UNIVERSITY OF MICHIGAN

LIBRARY OF THE UNIVERSITY OF MICHIGAN

CORNER ENTRANCES: LIBERAL ARTS BUILDING, LOUISIANA PURCHASE EXHIBITION, ST. LOUIS, MO.

BARNETT, HAYNES & BARNETT, ARCHITECTS.

The American Architect
April 18, 1903.

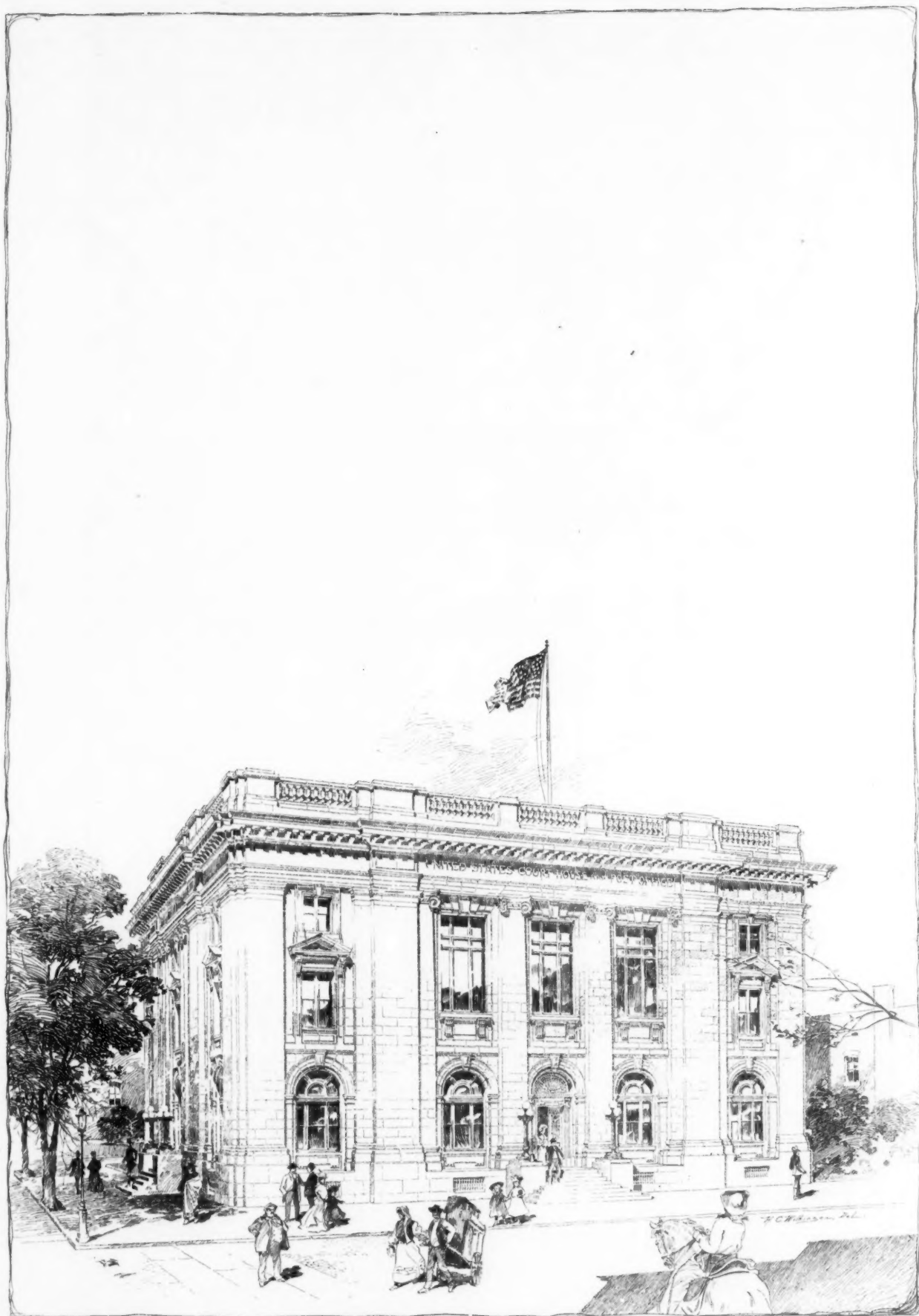


REPRODUCED BY THE AMERICAN ARCHITECT AND BUILDING NEWS CO.

HALF-TONE PRINTING CO., BOSTON

EXTERIOR ORDER: MAJESTIC THEATRE, BOSTON, MASS.
JOHN GALEN HOWARD, ARCHITECT.

The American Architect
April 18, 1903.
No. 1425.



COPYRIGHT 1903 BY THE AMERICAN ARCHITECT AND BUILDING NEWS CO.

MILGROVE PRINTING CO., DARTMOUTH.

U. S. POST OFFICE, ABERDEEN, SOUTH DAKOTA.
JAMES KNOX TAYLOR, SUPERVISING ARCHITECT.

The American Architect
April 18, 1903.
No. 1425.

THE AMERICAN ARCHITECT AND BUILDING NEWS

A WEEKLY JOURNAL OF CONSTRUCTIVE AND DECORATIVE ART

VOL. LXXX.—No. 1425.]

SATURDAY, APRIL 18, 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 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 equipment. For Catalogue apply to the Secretary, J. L. LOVE, 16 University Hall, Cambridge, Mass.
N. S. SHALER, Dean.

REDDING, BAIRD & CO.

83 FRANKLIN ST., BOSTON

Ask Investigation of

Baird's Hand-Made

Silver Glass

**For Dark Stores, Offices
and Workshops**

Translucent, Not Transparent. Beautiful
and Inexpensive.

LOOMIS FILTERS.

ESTABLISHED 1880.

Improved System. Simple and Effective.

LOOMIS-MANNING FILTER CO.,

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

"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

ITHACA, N. Y.

CORNELL UNIVERSITY

COLLEGE OF ARCHITECTURE

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

NEW YORK, N. Y.

COLUMBIA UNIVERSITY, IN THE CITY OF NEW YORK.

SCHOOL OF MINES.

SCHOOL OF CHEMISTRY.

SCHOOL OF ENGINEERING.

SCHOOL OF ARCHITECTURE.

SCHOOL OF PURE SCIENCE.

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

FLYNT

BUILDING AND CONSTRUCTION CO.

GENERAL OFFICE, PALMER, MASS.

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

CHURCHES, HOTELS, MILLS, PUBLIC
BUILDINGS AND RESIDENCES.

Also for the construction of
RAILROADS, DAMS AND BRIDGES.

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

The WINSLOW BROS. COMPANY,

CHICAGO,

Ornamental Iron and Bronze.

ST. LOUIS, MO.

WASHINGTON UNIVERSITY SCHOOL OF ENGINEERING AND ARCHITECTURE

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

FREDERICK M. MANN, Professor.

COLUMBUS, OHIO.

OHIO STATE UNIVERSITY COLLEGE OF ENGINEERING

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

PHILADELPHIA, PA.

UNIVERSITY OF PENNSYLVANIA. SCHOOL OF ARCHITECTURE.

PROF. WARREN P. LAIRD.

BOOKS:

"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:

"The Library of Congress."

20 Plates, folio. Price, \$5.00.

AMERICAN ARCHITECT COMPANY.

ROBERT C. FISHER & CO.

Successors to Fisher & Bird,

MARBLE AND GRANITE WORKS

97, 99, 101 and 103 EAST HOUSTON STREET,

Established 1890.

NEW YORK

Rain, Hail and Storm



TRADE MARK.

89 Market St., Chicago

beating against a front door will soon cause it to become white and weather-beaten unless the woodwork is protected by

Spar Coating

A perfect finish for exterior woodwork. For booklet write

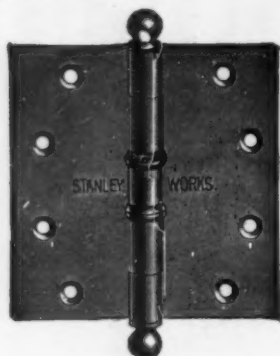
EDWARD SMITH & COMPANY

Varnish Makers and Color Grinders

45 Broadway, New York

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,

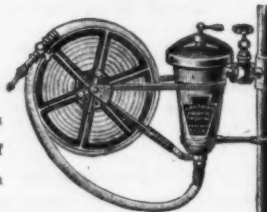
LIBRAIRIE DE LA CONSTRUCTION MODERNE,

18 Rue Bonaparte, Paris, France.

Established nearly 40 Years

The YANTACAW Chemical Fire Extinguisher

NO Acid used, nor poisonous gas generated
Danger from explosion
Danger from Chemical or stream to person or fabric
Periodical recharging, testing or polishing.
Always in the accustomed place and ready for instant use.
No mechanism to become defective.
Can be recharged in from twelve to twenty seconds.
Much more powerful and efficient than carbonic acid gas machines.
Made in sizes capable of charging 25, 50 and 100 gallons of water without recharging.
With the twin Yantacaw a continuous charged stream can be obtained.



Send for descriptive booklet.

Yantacaw Mfg. Co., 802 Land Title Bldg., Phila.

Sizes 25 gals., 14 in. in height
Size 100 gals., 26 in. in height

"MINOR FOUNTAINS,"

Being No. 3 of a Series of "Architectural Odds and Ends,"

40 GELATINE PRINTS - - \$5.00 PER COPY.

AMERICAN ARCHITECT CO.



THE NAME "Standard"

is cast in relief on every piece of the

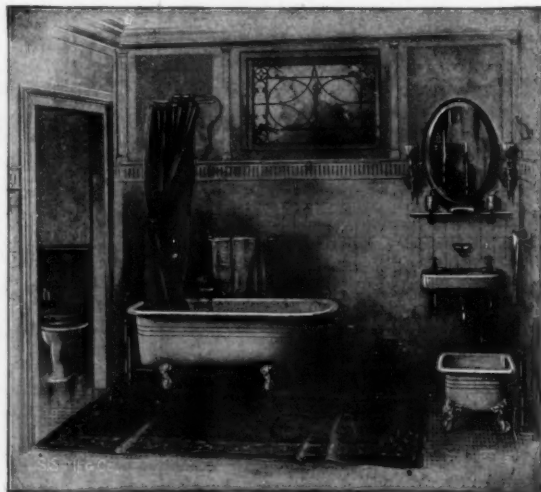
Porcelain Enameled Ware

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.

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
PHILADELPHIA

NEW YORK

BOSTON
CHICAGO



BARGAINS

We have a few incomplete sets of the

Imperial Edition of the American Architect

for the years 1893, 1894 and 1895 which we will sell at a bargain.

These are not second-hand copies, but fresh and perfect copies from our own stock-room.

Each copy contains, besides the black-and-white illustrations, a single gelatine print.

Each copy was published at twenty-five cents, but we will sell each lot as it stands for \$5.00.

Supplying each customer with the fullest of these incomplete lots in stock at the time of receiving his order.

The shortage runs from one to six or eight issues: for instance

One lot A.	1894.	Short one print.	E. & O. E.
Four lots B.	"	two "	"
One lot C.	"	two issues,	"
Four lots D.	"	six "	"

AMERICAN ARCHITECT COMPANY

211 Tremont Street, Boston

"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, Boston, Publishers

Topographical Index of Advertisers.

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

CONNECTICUT.		MASSACHUSETTS.		NEW JERSEY.		NEW YORK.	
Bridgeport.	Druid Co., The G.....[Sash Opener	Boston.	Crawford Specialty Co.....[Traps	Camden.	Montross Metal Shingle Co.....[Metal Shingle	N. Y. City.	Sargent & Co.....[Builders' Hardware
New Britain.	The Stanley Works.....[Wrought-Steel Rusts	Dadmun, Leon E.....[Photography (Architectural and Commercial)	Elston & Co., A. A.....[Buildings Torn Down	Jersey City.	Dixon Crucible Co., Jos.....[Graphite	Smith Co., H. B.....[Steam Boat	Smith & Co., Edward.....[Furnaces
New Milford.	Bridgeport Wood Finishing Co., The.....[Paint, etc.	Erickson Electric Equipment Co.....[Electrician	Gurney Heater Mfg. Co.....[Hot-water, etc.	Paterson.	Fennell Steel Co.....[Structural Iron	U. S. Mineral Wool Co.....[Mineral Wool	Van Kannel Revolving Door Co.....[Revolving
Stamford.	Yale & Towne Mfg. Co.....[Locks	Fowler, Herbert.....[Ornamental Plastering	Howe, Charles J.....[Clocks	Perth Amboy.	Perth Amboy Terra-Cotta Co.....[Terra-Cotta	Warren Chemical & Mfg. Co.....[Asphalt Roofing	Williams, John.....[Hardware (Art)
Waterbury.	Benedict & Burnham Mfg. Co.....[Benedict-Nickel" Seamless Tubing for Exposed Plumbing	Heliotype Printing Co.....[Art Printing	Jager Co., Charles J.....[Enginers	NEW YORK.		Yale & Towne.....[Brought Metal	Yale & Towne.....[Hardware (Art)
ENGLAND.		Lombard & Co., A. F.....[Architectural Ornamentation from		Irvington-on-Hudson.	Lord & Burham Co.....[Conservatories	Rochester.	Quaker Mfg. Co.....[Mail Chutes
The Architect and Contract Reporter.....[Magazine		Lunt, Moss & Co.....[Water supply Goods		Ithaca.	Cornell University.....[School	Troy.	Globe Ventilator Co.....[Ventilators
ILLINOIS.		Marble Co., W. P.....[Brass Finishers		Jamestown.	Art Metal Construction Co.....[Art Metal Work	Troy Laundry Machinery Co.....[Washing-Machines	
American School of Correspondence.....[Architectural Schools		McKay & Woolner [Contractors and Builders		Long Island City.	Richy, Brown & Donald.....[Ornamental Iron and Bronze	Canton.	Berger Mfg. Co., The.....[Metal Ceilings
Chicago & Alton Railway.....[Railroad Crane Co.....[Valves		Morrell & Whitten Construction Co.....[Masons and Builders		N. Y. City.	Alipie Co.....[Sculpture	Cleveland.	Tyler Co., The W. S.....[Ornamental Iron and Bronze
Northwestern Terra-Cotta Co.....[Terra-Cotta		Redding, Baird & Co.....[Stained Glass		American Iron Bridge Co.....[Steel Structures	Associated Expanded Metal Co.....[Expanded Metal	Columbus.	Kinnear & Gager Co., The.....[Metal Ceiling
Taylor, J. W.....[Photographs		Saulsbury Print Paper Co.....[Misc Prints		Atlas Cement Co.....[Cement	Columbia University.....[School	Nelson Co., The C. T.....[Capitals (Carved)	Ohio State University.....[School
Winslow Bros. Co., The.....[Ornamental Iron and Bronze		Standard Fire-escape & Mfg. Co.....[Fire-escape		Deane, E. Midon.....[Colorist	Elevator Supply and Repair Co.....[Electric Signals	Marletta.	Introitle and Novelty Co.....[Introitle
MAINE.		Sturtevant Co., B. F.....[Fan System		Fisher & Co., Robert C.....[Marble	Frank, L. F.....[Reflectors	Salem.	Milne, W. H.....[Architectural Metalwork
Rockport.		Van Noorden Co., E.....[Sightings, Metal		Hagen, Claude L.....[Stage Architect and Carpenter	Hayes, George.....[Metallic Looking	West Cleveland.	Caddell, F. E.....[Traps
Rockland-Rockport Lime Co.....[Lime		Whittier Machine Co.....[Elevators		Herzog Telescope Co.....[Elevator Signals	Hitchings & Co.....[Greenhouses	Pennsylvania.	
MARYLAND.		Clinton Wire Cloth Co.....[Metallic Looking		Jackson & Co., Wm. H.....[Grates	Jenkins Bros.....[Valves	Ambler.	Keasbey & Mattison Co.....[Magnesia Covering
Baltimore.		Palmer.		Neuchatel Asphalt Co.....[Asphalt	New Jersey Zinc Co.....[Zinc White	Philadelphia.	French & Co., Samuel H.....[Mortar Colors
MASSACHUSETTS.		Flyn Building & Construction Co.....[Building Contractor		New York Belting and Packing Co., Ltd.	N. Y. Metal Ceiling Co.....[Metal Ceilings	Loonila Filters Improved System.....[Filters	Merritt & Co.....[Lockers (Expanded Metal)
Amer. Mason Safety Tread Co.....[Stair Tread		Michigan.		Okonite Co. (Ltd.).....[Insulated Wire	Quimby, W. E. (Inc.).....[Electric Pumps	Merchant & Co., Inc.....[Roofing Plates	Morse, Williams & Co.....[Elevators
Bartlett Lumber Co.....[Redwood Lumber		Missouri.				Taylor Co., N. & G.....[Roofing Tin	Thorn, J. S. Co.....[Sheet Metal
Blodgett Clock Co.....[Clocks		St. Louis.				University of Pennsylvania.....[School	Yanacaw Mfg. Co.....[Fire Extinguisher
Broad Gauge Iron Rail & Vane Works.....[Stable Fixtures		Washington University School of Engineering and Architecture.....[School				Pittsburgh.	National Fireproofing Co.....[Fireproofing
Butcher Polish Co.....[Floor Polish						Standard Sanitary Mfg. Co.....[Porcelain	Exameled Ware.....[Graphite Pans
Cabot, Samuel.....[Decorative Cast						Wisconsin Graphite Paint.....[Graphite Paints	
Carnie, Hugh.....[Stone Carving and Modelling						York.	Vapor Heating Co.....[Heating Apparatus, Steam
Campbell, Walter M.....[Perspectives							
Carlisle, Pope & Co., E. A.....[Doors, Windows, Etc.							
Carter Ink Co.....[Ink							
Columbian Marble Quarrying Co.....[Marble							
Couch Co. S. H.....[Telephones							
Craig, David.....[Clean-out							

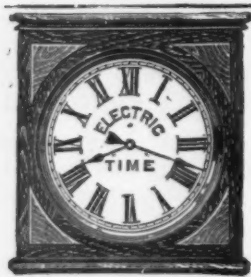


The Kinnear Stamped Steel Ceiling, Sidewall

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

[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.

Rudyard Kipling

and

“Topical Architecture”

15 Volumes of the first } All for \$5.00
12 Numbers of the second }

On receipt of five dollars we will deliver, carriage paid, a fifteen volume set of Rudyard Kipling's works—pocket-volume size—and will send “Topical Architecture” for one year from date of order.

AMERICAN ARCHITECT COMPANY, Publishers
211 Tremont Street, Boston

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

[Published February 7, 1903]

PART XII

**“THE
GEORGIAN
PERIOD”**

[PRICE \$6.00]

Containing 47 plates—gelatine, half-tone and line—10" x 14", 36 pages of text enlivened by 64 cuts, and the index for the third Volume.



This Part completes the third and final Volume of a work that critics have agreed to hold worth doing and to have been well done. We ourselves believe it to be a work of real value to the practising architect, for whose daily needs we have prepared it.



In the past we have done all that we could to enable subscribers to procure the work at the lowest practicable cost, and in future will accommodate purchasers in the matter of distributing payment over a reasonable period of time so far as we find it businesslike to do so.



As previously announced, the work now becomes a net publication at \$60.00.



AMERICAN ARCHITECT COMPANY

211 Tremont Street, Boston



THE Leads in Dixon's Pencils are the same all the way through. No hard spots; no soft spots; no surprises; an even, smooth, clean lead from tip to point. Ask for catalogue 14-j.

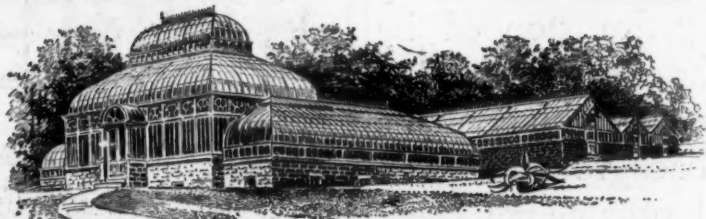
JOSEPH DIXON CRUCIBLE CO., JERSEY CITY, N. J.

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 serve 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.



HITCHINGS & CO. ESTABLISHED 1844
Greenhouse Heating and Ventilating
Horticultural Architects and Builders

Conservatories, Greenhouses, Palmhouses, Etc., erected complete with our PATENT IRON FRAME CONSTRUCTION

Send four cents for
Illustrated Catalogue

233 Mercer Street
NEW YORK

DRAWING



Yale & Towne Mfg. Company.

GENERAL OFFICES:
9-11-13 Murray St., New York.

Makers of The Yale Locks, Builders' Hardware and Art Metal Work.

Artist and Artisan is the title of an artistic brochure dealing with the origin of Ornamental Metal Work and its present development and uses. It will be sent to Architects on request.

9562-19

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.

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

Price, \$2.50 per set.

American Architect Company,
211 Tremont St., Boston, Mass.,
U. S. A.



JENKINS BROTHERS' VALVES

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

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

Insist on having the genuine, stamped with Trade Mark.

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

WARREN'S TRINIDAD ASPHALT

ROOFING "ANCHOR BRAND" PAVING

THE BEST MATERIAL FOR

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

CRANE VALVES

ESTABLISHED 1855

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,
205 BROADWAY - NEW YORK.

METAL CEILINGS
SIDE WALLS
AND
WAINSCOTING.
TELEPHONE - 46 10th 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

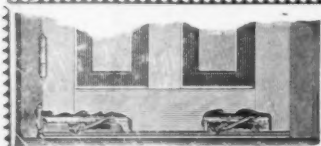
Samples and full information sent on request



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.

Write for illustrated booklet.

The Introstile & Novelty Co.
Marietta, Ohio.

Conservatories, Greenhouses, Vineries, Etc.

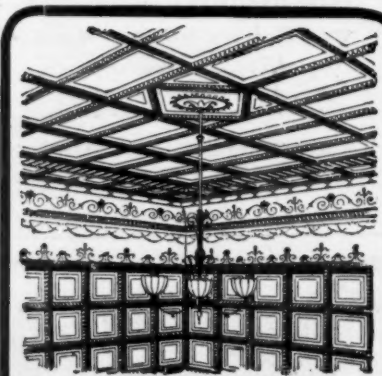
Designed, erected and heated. Catalogue, also special plans and estimates, on application.

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

That Stack Rooms of Libraries may be planned to serve as attractive backgrounds for delivery rooms is a fact often lost sight of. This treatment is peculiarly applicable to smaller buildings where only the stack house is fireproof. By increasing the size of openings from delivery rooms (which may be readily fire stopped by concealed doors or shutters) the effect of distance is at once secured, while the stacks with contents are agreeably set in relief as backgrounds. We have made a special study of ornamental stack work suited to this purpose, some examples of which are illustrated in Catalogue No. 500.

ART METAL CONSTRUCTION CO.

154 Gifford Ave., Jamestown, N. Y.



BERGER'S METAL CEILINGS

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

The Berger Manufacturing Co.
CANTON, OHIO

New York Office: 210 E. 32d St., New York, N. Y.
New England Branch: 176 Federal St., Boston, Mass.

Important Litigation Relating to Magnesia Covering Patents

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

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

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

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

KEASBEY & MATTISON COMPANY AMBLER, PENNA.

New York Boston Chicago Washington Atlanta New Orleans

Cleveland Cincinnati Milwaukee

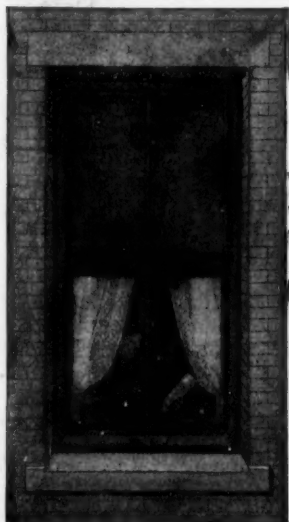
AUTHORIZED SELLING AGENTS

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

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

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

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



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

Are the **BEST FIRE-PROOF WINDOWS** of ANY KIND in the world to-day. They are absolutely **FIRE and WEATHER PROOF**. They **SAVE INSURANCE**, **REQUIRE NO SHUTTERS**, **INCREASE** and better **DIFFUSE LIGHT**, cannot be distinguished from the best woodwork, are the **ONLY** sliding sashes that

CLOSE AND LOCK AUTOMATICALLY

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

WE OPERATE NINE LARGE FACTORIES

Write for Catalogue and information to

SMITH-WARREN CO.
93 Federal St., BOSTON, MASS.

PERSPECTIVES RENDERED

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

MASON SAFETY TREAD

The All-Metal Stair Protection

Adopted for New York Subway

AMERICAN MASON SAFETY TREAD CO., BOSTON

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

324 Dearborn Street, CHICAGO, ILL.

E. ELDON DEANE,

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

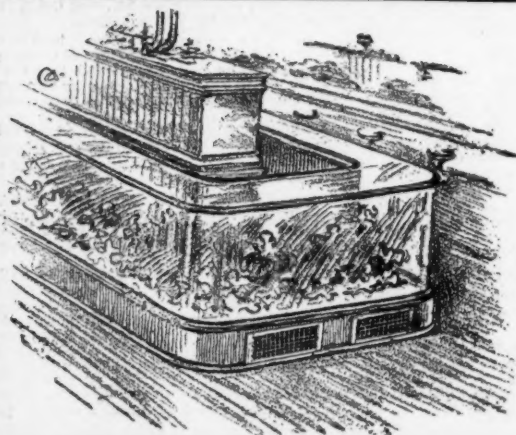
Masonry in Modern Work

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.

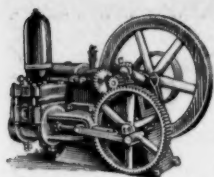


STORE HEATING AND VENTILATION

is only beginning to receive the attention it deserves. The really progressive merchant already sees the advertising value of a comfortable store and recognizes the mission of pure air as a means of increasing the efficiency of his employees. We employ the fan system, forcing the air under pressure to the desired points and insuring positive ventilation. The heating surface is localized, extended piping systems are avoided and the temperature automatically controlled.

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

Plans for a three-story stone and pressed brick apartment building, 38' x 100', to be erected at Jackson Ave. and 64th Pl., at a cost of \$25,000.



THE LUNT-MOSS
Gas or Gasoline Pumping Engine
 Sure to supersede Hot Air and Steam Pumps,
 Because They Are Better and More Economical. They START
 INSTANTLY. Will Pump 1000 gals. Water 100 ft. high
 per hour. Write Us Your Wants.
LUNT, MOSS & CO., Dept. B
 Contractors, Dealers in Water Supply Goods
 43 SOUTH MARKET STREET, BOSTON, MASS.
 Branch Office, Providence, R. I.

ELECTRIC HOUSE SERVICE PUMPS

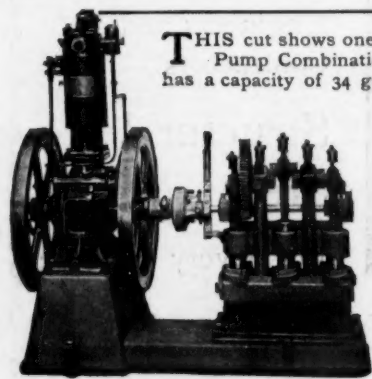
WILLIAM E. QUIMBY

[Incorporated]

141 Broadway, New York

CHICAGO
 EDWARD YEOMANS
 1141 MONADNOCK BLDG.

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



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

BUILDING INTELLIGENCE.

(Advance Rumors Continued.)

have been completed by Architect Perley Hale, 501 Atwood Building.

Cleveland, O.—It is reported that the Cleveland Burial Case Co. will erect a large factory at the corner of Mulron and Oregon Sts., and have had plans prepared. The building will cost about \$100,000.

Columbus, O.—Frank L. Packard has completed plans for the construction of St. Paul's Episcopal Church. This will be built of gray limestone and will cost \$60,000. Architect Packard has also prepared plans for a \$25,000 business block to be erected at the corner of Gay and 4th Sts.

Des Moines, Ia.—Plans for the club-house for the Elks have been completed by Hallett & Rawson, architects. It will be a three-story and basement, cost, \$40,000.

East Orange, N. J.—Messrs. Ludlow & Valentine, 100 Broadway, New York, are receiving estimates for a house, 50' x 65', to be erected for M. W. Adams, at the corner of Munn and Central Aves. Electric lighting and steam heating.

Erie, Pa.—It is reported that the Erie Amusement Co. has just been chartered with a capital stock of \$90,000. The company will call for bids for the construction of a modern theatre.

Fairfax, Minn.—Chas. Webster, architect, of Winthrop, has drawn plans for the proposed village hall. The building will include quarters for the power station of the new electric-light plant, and will cost about \$25,000. Plans will be ready about April 20.

Fort Dodge, Ia.—A new fire-department headquarters will be built here.

It is understood the Illinois Central will erect a four-story passenger station here to cost \$150,000. It is reported the Great Western will erect a \$60,000 depot.

Glenview, Ill.—This place will erect a new high-school building at a cost of \$65,000. Architects F. S. Barnum & Co. were awarded the contract for plans for this building after a competition with a number of other Cleveland architects.

Gloucester, Mass.—A lot of land valued at \$16,000 has been bought and a bequest of \$15,000 has been

BUILDING INTELLIGENCE.

(Advance Rumors Continued.)

received, and a canvass is being made to secure \$15,000 more for a Y. M. C. A. building.

Grinnell, Ia.—The trustees of Iowa College have accepted an offer of \$50,000 from Andrew Carnegie for a library building.

Houghton, Mich.—R. C. Pryor will erect a modern frame residence from plans by Charlton, Gilbert & Keunzli, architects, of Marquette. Cost, \$10,000.

Indianola, Ia.—Proudfoot & Bird, Des Moines, are preparing plans for a high-school building to be erected here. It will be brick, with stone trimmings, steam heat, plumbing. Cost, \$25,000.

Jamaica Plain, Mass.—The School-house Commission has selected A. Wadsworth Longfellow to draw plans for the new grammar school building to be erected on the old Christopher Gibson site, and Charles B. Perkins as architect for the completion of the Francis Parkman School-house.

Lakewood, O.—Plans will be prepared for the erection of a \$75,000 high-school building.

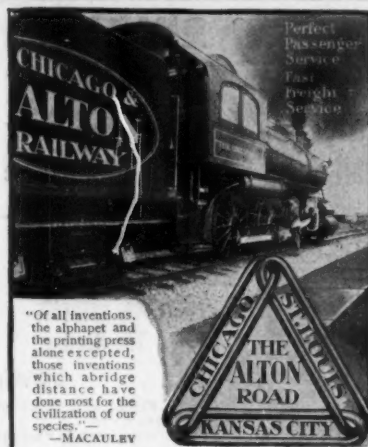
Louisville, Ky.—The Louisville & Nashville Railroad is receiving bids for the new office-building and freight depot at 9th St. and Broadway. The building is to be ten stories high, of terra-cotta brick. The plans were by Chief Engineer Montfort.

Lynn, Mass.—\$22,000 has been secured toward the \$75,000 to be raised for the new Y. M. C. A. building. This money added to the value of the present building will produce an amount sufficient to erect one of the best association buildings in New England.

Marion, Mass.—A commodious summer cottage, two and one-half stories high, will be erected at Allen's Point, for H. B. Shepard, of the Shepard & Morse Lumber Co., of Boston, to cost about \$12,000. Plans by Putnam & Cox.

Mason City, Ia.—It is reported that the Northwestern will erect a \$40,000 depot and expend \$30,000 in improvements in the yards.

Milwaukee, Wis.—A. C. Clas has let contracts for a six-story brick flat building to be erected on Grand Ave. Cost, \$65,000. It is reported that Chicago owners will erect a



"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.

BUILDING INTELLIGENCE.

(Advance Rumors Continued.)

\$40,000 apartment building at Greenfield Ave. and Grove St. It will contain 12 apartments.

The Salatin-Prinz Pneumatic Maltng Co. has begun work for an addition to its plant on S. Bay St., to cost \$50,000.

H. C. Koch & Co. have prepared plans for a factory for Willmans Bros., 47' x 140'. Cost, \$35,000.

The Christensen Engineering Co. will erect an addition to its plant to cost \$50,000. Will be three-story, 66' x 201', of concrete.

Mountain Iron, Minn.—Young & Nystrom, Duluth, have drawn plans for eight cottages for the Oliver Mining Co. to be erected at the Stevens mine and two officers' residences for the same company.

Nashville, Tenn.—It is stated the Addison Ave. Cumberland Presbyterian Society will build a \$20,000 church.

New York, N. Y.—Arrangements have been completed by which a seven-story dormitory building to accommodate 200 students will be erected near Columbia, and be ready for occupancy in the autumn. It will be the first dormitory at that university.

Presbyterians are to establish a new church in Aqueduct Ave., near the New York University. During the past year services have been conducted in the chapel of the university. An edifice is to be erected at a cost of about \$25,000.

Plans have been filed for a three-story brick public library to be erected at 67th St. and 1st Ave.; estimated cost, \$70,000. Babb, Cook & Willard, architects, 5 W. 29th St.

Plans have been filed for a six-story brick hospital to be erected at Avenue C and 16th St., at a cost of \$350,000, after plans by Smith, Westervelt & Austin, 7 Wall St.

The Tiffany Co. is to build a new store on the southeast corner of 37th St., probably 100' x 150', and eight stories high.

The new Bronx Park station house will be erected at the intersection of Mosholu Parkway and Bronx Park. The Board of Estimate has appropriated \$10,000 to start the work, and the resolution is now pending in the Board of Aldermen. It is estimated that the building will cost between \$80,000 and \$90,000.

Omaha, Neb.—H. J. Plunkett has let contracts for a three-story brick apartment building at 13th and Dodge Sts.; cost complete, \$40,000.

D. H. Mercer will erect a \$25,000 residence at 39th and Dodge Sts., on plans by Thos. R. Kimball, architect. It will be brick, modern. Work is to be started soon.

EDUCATIONAL.

New York, N. Y.—One Hundred and Forty-fifth St., nr. Willis Ave., four-story bk. school, 150' x 200'; \$250,000; o., City of New York; a., C. B. J. Snyder.

HOTELS.

Omaha, Neb.—Thirteenth St., No. 110, three-story bk. hotel, 66' x 132'; \$35,000; o., Lord H. C. Plunkett, London.

HOUSES.

Atlantic, Ia.—Two-story fr. dwell., hot water; \$10,000; o., J. E. Bruce; a., Hallett & Rawson, Des Moines.

Minneapolis, Minn.—Tenth Ave., No. 1607, two-story fr. dwell., 33' x 44', furnace; \$6,000; o., E. Johnson, 283 Cedar Ave.; a., A. A. Swan.

Fiftieth St. and Nicolet Ave., two-story bk. & st. cottage, 36' x 37', slate roof; \$7,500; o., Washburn Home; a., H. W. Jones.

Humboldt Ave., No. 3145, two-story fr. dwell., 28' x 34', furnace; \$4,500; o., Henry Wall; c., T. Fitzgerald.

Eleventh Ave., No. 2534, two-story & base. bk. dwell., 28' x 45', furnace; \$4,500; o., C. W. Anderson, 2509 Eleventh Ave.

James Ave. S., and Nineteenth St., two-story fr. dwell., 31' x 39', hot water; \$5,000; a., H. G. Carter.

Noblesville, Ind.—Two-story bk. & st. dwell., furnace; \$10,000; o., H. G. Brown; a., Sedgwick & Saxton.

Omaha, Neb.—Thirty-first and Douglas Sts., two-story fr. dwell., furnace; \$5,500; o., M. J. Kennard; a., F. A. Henninger.

BEAUTIFUL HARDWOOD FLOORS

To obtain the most satisfactory and durable results, first fill with **Wheeler's Patent Wood Filler** (which is everywhere recognized as the standard, and specified by all leading architects,) then apply **Breinig's Floor Polish**. Our process is on the true principle for lasting qualities—walk on the floor, not on the finish. Write for particulars.

THE BRIDGEPORT WOOD FINISHING CO.

NEW MILFORD, CONN.

55 FULTON ST., NEW YORK; 70 W. LAKE ST., CHICAGO; 231 DOCK ST., PHILADELPHIA

METAL SHINGLE-ROOFING Best for house or barn. Fire-proof. Easily Laid. Cheaper than slate or wood. Prices, catalogue and testimonials FREE. **MONTESS SHINGLE CO., Camden, N. J.**



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



As a precaution to promote health

Expanded Metal

wardrobes and lockers should be used to store clothing, because they admit light and air on all sides.

Wardrobes or other enclosures made of this material can be made very attractive and it is far more durable than any other material used for this purpose. It will be well to specify



Expanded Metal

in your plans.

MERRITT & CO.

1011 Ridge Avenue

PHILADELPHIA

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 washes.

Nos. 1223 to 1233 Callowhill Street
PHILADELPHIA, PA.

BUILDING INTELLIGENCE.

(Houses Continued.)

Portland, Ore.—Holladay Park, two-st'y fr. dwell., 30' x 38'; \$5,000; a., W. S. Hunt, Minneapolis, Minn.

Sank Center, Minn.—Two-st'y bk. dwell., 25' x 50', hot water; \$10,000; o., C. M. Sprague; a., H. Arnold.

LIBRARIES.

New York, N. Y.—E. Sixty-seventh St., No. 328, four-st'y bk., granite & limestone. Carnegie Library building, 60' x 75'; \$70,000; a., Babb, Cook & Willard.

MERCANTILE BUILDINGS.

Stanton, Neb.—Two-st'y bk. bank, steam; \$6,000; o., First National Bank; a., A. H. Dyer, Fremont.

St. Paul, Minn.—Fifth St., nr. Cedar St., three-st'y bk. building, 50' x 150'; \$45,000; o., P. N. Peterson; a., Reed & Stem.

OFFICE BUILDINGS.

Battle Creek, Mich.—Six-st'y bk. & st. fireproof office & store building, 66' x 180'; \$100,000; o., C. A. Ward, 1117 Chamber of Commerce; a., George L. Harvey, 175 Dearborn St.

STABLES.

Austin, Minn.—Two-st'y bk. & st. livery barn, 50' x 100', steam; \$8,000; o., J. P. Rogers; a., Kinney & Detweiler, Minneapolis.

Chicago, Ill.—S. Paulina St., Nos. 1213-47, one & two-st'y bk. private barn, 40' x 225'; \$6,500; o., Barber Asphalt Co., Stock Exchange Building; a., William F. Gubbins, cor. 12th St. & Ogden Ave.; b., Wells & Campbell, 497 Nineteenth St.

Crookston, Minn.—1½-st'y barn, 58' x 107'; \$5,000; o., State Experimental Farm; a., Oneyer & Thori.



Hotel Regis, S. E. cor. 5th Ave. and 55th St., New York.

Buildings
Roof
Trusses

**American
Bridge
Company**
OF NEW YORK

Engineers and
Contractors

Structural
Steel

For Every Purpose

EXPANDED METAL

For Fireproofing and Concrete Construction

ASSOCIATED EXPANDED METAL COMPANIES Room 1203, 256 Broadway NEW YORK

PASSAIC STEEL COMPANY

A. C. FAIRCHILD, Pres.

GEO. H. BLAKELEY, Chf. Engr.

SUCCESSOR TO
Passaic Rolling Mill Company

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, 21 State St.

New York Office, 5 Nassau St.

BUILDING INTELLIGENCE.

STORES.

Chicago, Ill.—Michigan Ave., Nos. 11109-11, one-st'y bk. store & barn, 41' x 120', gravel roof, steam; \$6,000; o., Wm. C. Wood, 11108 Michigan Ave.; a., C. F. Jobson, Pullman Building; b., Van Etten Brothers, 111122 Michigan Ave.

W. Twelfth St., Nos. 2089-91, two-st'y bk. store & storage, 50' x 112'; \$10,000; o., Meyer Brothers; a., E. Bessler, 820 W. 12th St.; b., A. Buhmann, 624 W. 21st St.

N. Ashland Ave., No. 1600, two-st'y bk. store & flats, 24' x 74'; \$7,000; o., Geo. Sprengel; a., Frank Kaseberg, 770 Sheffield Ave.; b., Geo. Buno.

Forty-second Ave., No. 921, three-st'y bk. store & flats, 30' x 92'; slate roof; \$12,000; o., Henry Schram; a., Henry Worthman, 625 W. Chicago Ave.; b., A. Lund, 271 W. Huron St.

S. St. Louis Ave., No. 1331, one-st'y bk. store & flat, 34' x 86'; \$5,500; o., J. Petzelka; a., Anton Charvat, 547 Blue Island Ave.; b., John Rus, 911 W. 19th St.

N. Clark St., No. 548, one-st'y bk. store, 29' x 100'; \$4,000; o., Lensenbarth; a., J. A. Miller, 59 Clark St.; b., L. E. Weick, 451 Cleveland Ave.

Escanaba, Mich.—Three-st'y bk. store-building, 50' x 140'; \$30,000; o., Sam'l B. Rattison; a., Charlton, Gilbert & Kuenzli, Marquette.

Minneapolis, Minn.—Western Ave., No. 18, two-st'y bk. store, 22' x 60'; \$5,000; o., Sodergren Bros.; b., V. W. Voorhes, Jr.

Franklin Ave., bet. 16th St. & Bloomington Ave., two-st'y bk. store, 32' x 64', gravel roof, steam; \$8,000; o., A. Anderson; a., W. S. Hunt.

New York, N. Y.—Twenty-fourth St., No. 131, seven-st'y bk. loft building with stores, 25' x 105'; \$30,000; o., A. Pfennig; a., Kurtzer & Reutz.

Willis Ave., nr. 143d St., one-st'y bk. store & dwell., 25' x 95'; \$8,000; o., estate of Isaac Levy; a., Louis Falk.

Olivia, Minn.—Two two-st'y bk. stores, 25' x 80' & 25' x 64'; \$10,000; o., Fremont D. Orff, Minneapolis.

Rio, Wis.—Two-st'y bk. store & flat, 36' x 72', comp. roof, steam; \$5,000; o., G. B. E. Jackson; a., C. H. Williams.

TENEMENT-HOUSES.

New York, N. Y.—First Ave., Nos. 18-20, six-st'y bk. tenement with store, 44' x 87'; \$35,000; o., Baum & Lapin; a., Bernstein & Bernstein.

E. Fifth St., Nos. 805-809, six-st'y bk. tenement

BUILDING INTELLIGENCE.

(Tenement-Houses Continued.)

with store, 54' 6" x 84'; \$45,000; o., S. Michelson; a., Horenburger & Straub.

THEATRES AND HALLS.

Fairfax, Minn.—Two-st'y bk. opera-house, 50' x 128', gravel roof, steam; \$25,000; a., C. E. Webster, Winthrop.

WAREHOUSES.

New York, N. Y.—Fourteenth St., nr. 6th Ave., six-st'y bk. loft, 25' x 93'; \$30,000; o., R. Smith; a., B. W. Levitan.

Broadway, No. 656, twelve-st'y bk. loft with store, 28' 6" x 130'; \$130,000; o., M. Zimmerman; a., F. C. Browne.

St. Paul, Minn.—Livingston and Indiana Aves., four-st'y bk. & st. warehouse, 100' x 100', pitch & gravel roof, steam; \$60,000; o., Geo. C. Taylor; a., Mark Fitzpatrick, 17 N. 9th St.

MISCELLANEOUS.

Carthage, Ill.—Three-st'y st. court-house, 96' x 103', tile roof, steam; \$100,000; a., Rob't J. Hotchkiss, Peoria.

New York, N. Y.—E. Seventy-first St., Nos. 31-37 six-st'y bk. house for nurses, 94' x 102'; \$300,000; o., Presbyterian Hospital; a., J. B. Baker.

Red Wing, Minn.—Four-st'y bk. & st. auditorium, 64' x 129', comp. roof, steam; \$46,000; o., F. B. Shelden; a., L. A. Lamoreaux.

PROPOSALS.

BUILDING.

[At Tongue River Agency, Mont.] Department of the Interior, Office of Indian Affairs, Washington, D. C. Sealed proposals will be received at this office until April 30, 1903, for furnishing and delivering the necessary material and labor to construct and complete a combination dormitory, school and mess, employees quarters, laundry, warehouse, gas-house and piping, and water and sewer system on the Busby Ranch, Tongue River Agency, Mont., all in strict accordance with the plans, specifications and instructions to bidders. For further information apply to this office or to the U. S. Indian Agent, Tongue River Agency, Mont. W. A. JONES, Commissioner, 1425

(Continued on page xiii.)

VAN NOORDEN'S**Sheet Metal Work**

The unusual kind; rich in artistic treatment and mechanical perfection. The product of ample capital, inventive genius, mechanical skill. We want your work because we put the relish of the saltiness of experience into it. Guaranteed the standard, unexcelled, unapproached. Catalogue and money-saving data free.

E. VAN NOORDEN CO.,
944 Massachusetts Ave., Boston.

COMPETITIONS.**Boston Society of Architects.****ROTCH TRAVELLING-SCHOLARSHIP.****Twentieth Annual Competition.**

The examination for the Rotch Travelling-Scholarship will be held at the Boston Architectural Club, 14 Somerset Street, Boston, on Monday and Tuesday, April 20th and 21st, at nine o'clock A. M.

Candidates must be under thirty years of age, must have worked during two years in Massachusetts in the employ of an architect resident in Massachusetts, and will be required to pass preliminary examinations upon the following subjects:—

- I. Construction, Theory and Practice. (Written examination.)
- II. An Elementary Knowledge of the French Language. (Written examination.)
- III. History of Architecture. (Written examination.)
- IV. Freehand Drawing from the Cast.

Candidates who pass in these preliminary examinations will be asked to present themselves on the Saturday following, for the competition in Design. Candidates who have passed in the preliminary examinations since 1897 are eligible for admission to the competition in Design without re-examination.

The successful candidate in each yearly examination receives from the Trustees of the Scholarship annually, for two years, \$1,000, to be expended in foreign travel and study; provided always that the beneficiary shows such fitness and diligence as may be required of him.

The Boston Society of Architects has offered the sum of \$75 as a second prize.

Candidates are required to register their names with the Secretary of the Committee three days before the opening of the examinations.

Any further information concerning the Scholarship can be obtained upon application to

C. H. BLACKALL, Secretary,
1 Somerset St., Boston, Mass.

1425

PROPOSALS.**WAREHOUSE AND BARN.**

[At Tomah Indian School, Wis.]
Department of the Interior, Office of Indian Affairs, Washington, D. C. Sealed proposals will be received at the Indian Office until April 28, 1903, for furnishing the necessary materials and labor required to construct and complete at the Tomah Indian School, Wis., a frame warehouse and a frame barn with silo, in strict accordance with plans, specifications and instructions to bidders. For further information apply to L. M. Compton, Supt., Indian School, Tomah, Wis. A. C. TONNER, Acting Commissioner. 1425

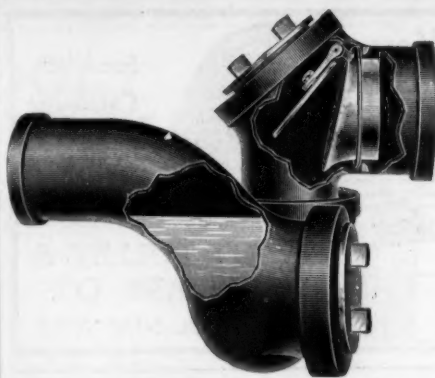
MASON AND CARPENTRY WORK, ETC.

[At South Boston, Mass.]
The School-house Commissioners of Boston invite proposals for doing mason, carpentry and other work in the Lawrence School, B and 3d Sts., South Boston, Mass., also proposals for installing a plumbing system in said building. Only proposals obtained at the office of the Commissioners, 120 Boylston St., and left before April 23d, 1903, at said office will be publicly opened and read. R. CLIPSTON STURGIS, JOHN H. COLBY, FREDERIC O. NORTH, Commissioners. 1425

Treasury Department, Office of the Supervising Architect, Washington, D. C., April 9, 1903. Sealed proposals will be received at this office until 3 o'clock P. M. on the 12th day of May, 1903, and then opened, for the construction, including plumbing, heating and electric wiring and conduits of the extension to the U. S. Post-office and Court-house at Beaumont, Texas, in accordance with the drawings and specification, copies of which may be had at this office or at the office of the Custodian at Beaumont, Texas, at the discretion of the Supervising Architect. JAMES KNOX TAYLOR, Supervising Architect. 1426

Treasury Department, Office of the Supervising Architect, Washington, D. C., April 11, 1903. Sealed proposals will be received at this office until 3 o'clock P. M. on the 25th day of May, 1903, and then opened, for the installation of a conduit and electric wiring system for the U. S. Post-office at Lockport, N. Y., in accordance with the drawings and specification, copies of which may be obtained at this office or at the office of the Superintendent of Construction at Lockport, N. Y., at the discretion of the Supervising Architect. JAMES KNOX TAYLOR, Supervising Architect. 1426

Treasury Department, Office of the Supervising Architect, Washington, D. C., April 11th, 1903. Sealed proposals will be received at this office until 3 o'clock P. M. on the 14th day of May, 1903, and then opened, for the construction (except heating apparatus and passenger elevator) of the extension of the U. S. Custom-house and Post-office at Hartford, Connecticut, in accordance with drawings and specification, copies of which may be had at this office or at the office of the Custodian at Hartford, Connecticut, at the discretion of the Supervising Architect. JAMES KNOX TAYLOR, Supervising Architect. 1426

**CRAWFORD****Adjustable Running Trap**

With Back Water Valve

(PATENTED)

Crawford Specialty Co. 311 Warren Street
BOSTON, MASS.

PROPOSALS.**STEAM-HEATING PLANT.**

[At Shakopee, Minn.]

Sealed bids will be received by the Board of County Commissioners of Scott County, Minn., at the office of the County Auditor in Shakopee, Minn., until May 8th, 1903, for placing a steam-heating plant in the court-house of said county, according to plans and specifications on file with the said auditor; also at Builders' Exchange, Minneapolis, and Builders' Exchange, St. Paul. J. H. MOORE, County Auditor. 1426

BUILDING.

[At Rapid City, S. D.]

Department of the Interior, Office of Indian Affairs, Washington, D. C. Sealed proposals will be received at the Indian Office until May 1, 1903, for furnishing and delivering the necessary materials and labor required to construct and complete a frame employees' quarters and frame addition to laundry, and a brick employees' quarters, all with plumbing and acetylene gas piping; also an addition to a brick dormitory with plumbing and gasoline gas piping and a frame acetylene gas-house, with plumbing and heat and a quantity of gas-fixtures, all at the Indian School, Rapid City, S. D., in strict accordance with plans, specifications and instructions to bidders. For further information apply to Sam B. Davis, Supt., Indian School, Rapid City, S. D. A. C. TONNER, Acting Commissioner. 1426

BUILDINGS.

[At Flandreau, S. D.]

Department of the Interior, Office of Indian Affairs, Washington, D. C. Sealed proposals will be received at the Indian Office until May 6, 1903, for furnishing the necessary materials and labor required to construct and complete at the Flandreau Indian School, S. D., one brick warehouse and office with plumbing and steam heat; one brick shop and one frame laundry with plumbing and electric light, in strict accordance with plans, specifications and instructions to bidders. For further information apply to Chas. F. Pierce, Supt. Indian School, Flandreau, S. D. A. C. TONNER, Acting Commissioner. 1426

SCHOOL.

[At Hamilton, O.]

Geo. W. Barkman will receive bids May 1 for erecting a 10 room school for St. Joseph's Catholic Church, to cost \$25,000. 1426

HIGH SCHOOL.

[At Olivia, Minn.]

Bids are wanted April 27 for erecting a high school. Address J. M. PECKINPAUGH, Clk. 1425

PROPOSALS.**STEAM-HEATING PLANT.**

[At Sarnia, Ont.]

Bids, including plans and specifications, will be received April 25 for a low-pressure steam-heating plant for a 6-room school on Devine St. J. W. SMITH, Chmn. Management Com. Bd. Educ. 1425

HEADSTONES.

[At Boston, Mass.]

Depot Quartermaster's Office, 170 Summer St., Boston, Mass. Sealed proposals will be received here until April 30, 1903, for supplying 10,000 (subject to an increase or decrease of from 5 to 50 per cent) American white marble headstones, or slabs. Information furnished on application. CAPT. A. M. PALMER, Depot Q. M., Boston, Mass. 1425

ROAD-CONSTRUCTION, CEMENT, SAND, ETC.

[At Washington Barracks, D. C.]

U. S. Engineer Office, Washington Barracks, D. C. Sealed proposals for Portland and natural cement, sand, gravel, construction of roads and sidewalks, including grading and retaining walls, sewers, drains, and water-supply system at Washington Barracks, D. C., will be received at this office until April 30, 1903. Information furnished on application. JOHN STEPHEN SEWELL, Captain, Engineers, Acting Q. M., U. S. A. 1425

BUILDING.

[At Fort Lincoln, N. D.]

Geo. E. Pond, chief quartermaster, will receive bids until April 30 for the construction of an administration building and power magazine at Fort Lincoln, N. D. 1125

PORTLAND CEMENT.

[At Catlettsburg, Ky.]

U. S. Engineer Office, Custom-house, Cincinnati, O. Sealed proposals for furnishing about 5,000 barrels American Portland cement at Catlettsville, Ky., for use at Dam No. 1, Big Sandy River, will be received here until noon, standard time, May 4, 1903. Information furnished by MAJOR ERNEST H. RUFFNER, Engrs. 1426

BUILDING MATERIALS, HARDWARE, ETC.

[At West Point, N. Y.]

Sealed proposals will be received here until May 1, 1903, for building materials, plumbing materials, hardware, tools, paints, glass, furnace and range parts, and other miscellaneous stores specified on schedules to be had upon application here. Q. M., U. S. M. A. 1426



Bank
Counter
Railings

IN IRON,
BRASS and
BRONZE

A SPECIALTY

RICHEY, BROWNE & DONALD
IRON, BRASS AND BRONZE

Borden and Review Aves.

LONG ISLAND CITY, N.Y.

Grant Overhead Window Pulley

McQueen's Patents
Specified by the leading Architects of United States and Canada



Send for Catalogue

Grant Roller Bearing Pulley

GRANT PULLEY & HARDWARE CO.
23½ Warren St. NEW YORK

"COHESIVE CONSTRUCTION."

An Essay on the Theory and History of Cohesive Construction.

By **RAFAEL GUASTAVINO, Architect.**

Price, \$1.25.

"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 Co.

PUBLISHERS

Are You Going Abroad this Year?

If you are, you could not better prepare yourself to benefit fully by the opportunities than by reading the series of papers enumerated below, which have appeared in the American Architect from time to time. As these notes of travel have been written by architects and architectural students they are far better for your purpose than guide-books. They are full of hints as to how to travel at small cost; how to reach points of interest; how to avoid overlooking things worthy of observation.

"Hints on Travelling."—Four papers, beginning with No. 999.

"An Architectural Knockabout. I."—Seven papers [Illustrated], beginning with No. 706.
[This series is out of print.]

"An Architectural Knockabout. II."—Eight papers [Illustrated], beginning with No. 908.

"Everyday Italy."—Four papers [Illustrated], beginning with No. 1051.

"A Trip Abroad."—Five papers, beginning with No. 312.

"An Editor's Trip Abroad."—Fourteen papers, beginning with No. 548.

"A Run Through Spain."—Fourteen papers [Illustrated], beginning with No. 779.

"An Architect's Journey in Europe."—Nine papers [Illustrated], beginning with No. 50.

"An Architectural Summer School Abroad."—Ten papers [Illustrated], beginning with No. 1127.

"Spanish Architecture."—Thirteen papers [Illustrated], beginning with No. 407.

"A Corner of Old France."—Four papers [Illustrated], beginning with No. 1289.

"Italian Cities."—Thirteen papers [Illustrated], beginning with No. 637.

"A Splendid Trip," and "Sketches on the Wing."—Two papers [Illustrated]. Nos. 183 and 125.

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

AMERICAN ARCHITECT CO.

MINERAL WOOL

FIRE, SOUND and VERMIN PROOF INSULATOR.

Samples and Circulars Free.

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

"Italian Renaissance Doorways"

104 PLATES, 10 x 14 1-2 inches

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

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

American Architect Company, Publishers
211 Tremont Street, Boston

NEW ENGLAND MATERIAL-MEN AND CONTRACTORS.

BLUE PRINTING.

B. L. MAKEPEACE,
345 Washington St., Boston, Mass.
CHAS. E. MOSS,
Rapid Printing Papers,
38 Broad St., Boston.

BUILDINGS TORN DOWN.

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

CHURCH MEMORIAL WINDOWS.

REDDING, BAIRD & CO.,
83 Franklin 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.

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.,
(L. M. Glover, Agent)
220 Devonshire St., Boston, Mass.

MASONS AND BUILDERS.

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

MODELLING AND ORNAMENTAL PLASTER.

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

ORNAMENTAL PLASTER-ING.

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

PHOTOGRAPHY.

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

WATERPROOF CELLARS.

FRANK B. GILBRETH,
Park Row Bldg., New York.
176 Federal St., Boston.

Professional Ethics.

The following . . .

. . . CODE OF ETHICS . . .

Prepared in Conformity with the Best Standards of Practice, and Recommended to its Members by the Boston Society of Architects, was . . .

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Otis Automatic Residence Elevators

are particularly well adapted for private residence service, as with our improved Push Button System of Control a regular attendant is unnecessary, this operating device being so simple that the younger members of the family can manage the car with entire safety. The car is under the perfect control of the passenger.

The Otis Elevator Company has been awarded a contract for eighteen electric elevators equipped with the Push Button System of control—the largest number of elevators of this type ever included in a single contract. These elevators are to be installed, one each, in a row of private residences now being constructed for F. Ambrose Clark on 74th Street, between Central Park West and Columbus Avenue, New York.

Otis Elevator Company

71 Broadway, New York

Branch Offices throughout the country

BRONZE

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

WROUGHT IRON

BINDING.

The Standard Binding of the *American Architect* is a Cloth binding, which varies in color for the several editions, as follows:—

For the Regular Edition - - - - Maroon.
“ “ International Edition - - - - Blue.

The REGULAR EDITION is bound in Semi-annual Volumes.

The INTERNATIONAL EDITION is bound in Quarterly Volumes.

The price for binding is \$2.00 per volume, Semi-Annual or Quarterly. Any variation from our standard practice will entail an increased charge.

In every case the Plates are bound all together at the back of the volume to which they belong—the Double Plates being mounted upon guards.

Volumes sent to us for Binding will be treated according to this system, unless instructions of a contrary nature are given at the time the work is placed in our hands.

THE
Northwestern Terra-Cotta Co.
Manufacturers of
Architectural Terra-Cotta.
WORKS & MAIN OFFICE: CITY OFFICES:
Cor. Olybourn & Wright- Room 1118 Hookery Bldg.
wood Avenues. cor. La Salle & Adams St.
CHICAGO.
Estimates given on application. Send for
Catalogue and Samples.

PERTH AMBOY
TERRA-COTTA COMPANY,

PERTH AMBOY, NEW JERSEY.

OFFICE, 160 Fifth Ave., NEW YORK.

BOSTON AGENTS:
WALDO BROS., 102 MILK STREET.

There's Nothing Better

and nothing quite so good to preserve the life of a *smoke stack, corrugated iron structure, steel frame buildings and metallic roofs*, as

Wisconsin Graphite Paint

It does not scale, blister or peel off from the effects of heat or cold, chemical vapors or acids and is a

Foe to Rust

Comes in 5 shades and colors.

Write today for free
sample and prices.

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

[See Alphabetical Index on Cover 2 for Pagination.]

CLASSIFIED ADVERTISEMENTS.

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

- | | | | |
|---|---|---|---|
| AEOLIPYLE.
Æolipyle Co., New York..... | CAPITALS (Carved).
O. T. Nelson Co., The, Columbus, Ohio | CUPOLAS (Foundry).
Northern Engineering Works, De-
troit, Mich. | FILING DEVICES.
Art Metal Construction Co., James-
town, N. Y..... |
| ARCHITECTURAL METALWORK.
Mullins, W. H., Salem, O. | CARVING.
Lombard & Co., A. P., Boston..... | CUTLER PAT. MAILING SYSTEM.
Quiser Mfg. Co., Rochester, N. Y..... | FILTER.
Loomis-Manning Filter Co., Phila., Pa. |
| ARCHITECT'L ORNAMENTATION.
Lombard & Co., A. P., Boston | CEMENT.
Alsen's Cement Works, N. Y....(eow) | DEAFENING QUILT.
Samuel Cabot, Boston, Mass..... | FIRE-ESCAPES.
Standard Fire-escape & Mfg. Co., Bos-
ton..... |
| ART METALWORK.
Art Metal Construction Co., James-
town, N. Y..... | CLEAN-OUT.
Craig, David, Boston..... | DOORS (Steel Rolling).
Kinneer Mfg. Co., The, Columbus, O. | FIRE EXTINGUISHER.
Yantacaw Mfg. Co., Philadelphia, Pa. |
| ASPHALT.
Neuchatel Asphalt Co., New York... | CLOCKS.
Hodgett Clock Co., Boston..... | DOORS, WINDOWS, ETC.
Carlisle, Pope & Co., E. A., Boston... | FIREPROOFING.
Associated Expanded Metal Co., New
York |
| ASPHALT ROOFING.
Warren Chemical & Mfg. Co., N. Y. | COMPOSITION ORNAMENT.
Lombard & Co., A. P., Boston..... | DRAUGHTSMAN.
E. Eldon Deane, New York..... | NATIONAL FIREPROOFING CO., PITTSBURG,
Pa..... |
| BLUE PRINTS.
Makepeace, B. L., Boston..... | CONSERVATORIES.
Lord & Burnham Co., Irvington-on-
Hudson, N. Y..... | ELECTRICAL CONTRACTORS.
Erickson Electric Equipment Co.,
Boston | FIREPROOF LATHING.
Hayes, Geo., New York..... |
| BRASS FINISHERS.
Marble Co., W. P., Boston..... | CONTRACTING.
Flynt Building & Construction Co.,
Palmer, Mass..... | ELECTRIC SIGNALS.
Elevator Supply & Repair Co., New
York..... | FIREPROOF SHUTTERS.
Kinneer Mfg. Co., The, Columbus, O. |
| BRICKS (Red Oxide).
Wisconsin Graphite Co., Pittsb'g, Pa. | CONTRACTORS AND BUILDERS.
McKay & Woolner, Boston..... | ELEVATORS, ETC.
Morse, Williams & Co., Philadelphia.
Otis Elevator Co., New York..... | FLAG POLES.
Boston Flag Pole Co., South Boston.. |
| BRONZEWORK (Ornamental).
Riehey, Browne & Donald, Long
Island City, N. Y..... | CORDAGE.
Samson Cordage Works, Boston....(eow) | ENGINEERS.
Jager Co., Charles J., Boston..... | FLOOR POLISH.
Butcher Polish Co., Boston..... |
| TYLER CO., THE W. S., CLEVELAND, O.... | CRANES.
Northern Engineering Works, De-
troit, Mich..... | FAN SYSTEM.
Sturtevant Co., B. F., Boston, Mass.. | FOUNDRY EQUIPMENT.
Northern Engineering Works, De-
troit, Mich..... |
| WINSLOW BROS. CO., THE, CHICAGO, ILL. | | | GATES.
Wm R. Pitt, New York.....(mon) |
| BUILDINGS TORN DOWN.
Elston & Co., A. A., Boston..... | | | GRATES, ETC.
Wm. H. Jackson & Co., New York... |
| CAPITALS.
Lombard & Co., A. P., Boston..... | | | GREASE (Graphite).
Wisconsin Graphite Co., Pittsb'g, Pa. |