The American Architect and Building News

A WEEKLY JOURNAL OF CONSTRUCTIVE AND DECORATIVE ART

VOL. LXXXIV.—No. 1481.] SATURDAY, MAY 14 1904. PRICE, { INTERNATIONAL ISSUE, 50 CTS / REGULAR " 15 "

Topographical Index of Advertisers.

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

CONNECTICUT.

South Norwalk.
United States Foundry and Sales Company. . . . . *Castings*

Stamford.
Yale & Towne Mfg. Co. . . . . *Locks*

ENGLAND.

London.
Architect and Contract Reporter, The. . *Magazine.*
Building News, The. . . . . *Periodical*

ILLINOIS.

Chicago.
Chicago & Alton Railway. . . *Railroad*
Crane Co. . . . . *Valves*
Miller & Bro., James A. . . . *Wire Glass Windows.*
Northwestern Terra-Cotta Co. *Terra-Cotta*
Taylor, J. W. . . . . *Photographs*
Winslow Bros. Co., The. . *Ornamental Iron and Bronze.*

IOWA.

Council Bluffs.
Kimball Bros. Co. . . . . *Elevators*

MARYLAND.

Baltimore.
Lafayette Mill and Lumber Co., The. . *Lumber.*
Vaile & Young. . . . . *Skylights*

MASSACHUSETTS.

Boston.
American Mason Safety Tread Co. *Stair Tread.*
Blodgett Clock Co. . . . . *Clocks*
Broad Gauge Iron Stall & Vane Works. *Stable Fixtures.*
Burditt & Williams Co. . . . *Hardware*
Butcher Polish Co. . . . . *Floor Polish*
Cabot, Samuel. . . . . *Deafening Quilt*
Cairns, Hugh. . *Stone Carving and Modelling*
Campbell, Walter M. . . . *Perspectives*
Columbian Marble Quarrying Co. *Marble Dealers.*
Couch Co., S. H. . . . . *Telephones*
Craig, David . . . . . *Clean-out Fireplaces.*
Crawley & Son, George E. . . *Tiles and*
Dadmun, Leon E. . *Photography (Architectural and Commercial).*
Edison Light. . . . *Electric Apparatus*
Elston & Co., A. A. . *Buildings Torn Down*
Erickson Electric Equipment Co. *Electrical Contractors.*
Folsom Snow Guard Co. . *Snow Guards*
Fowle, Herbert. . *Ornamental Plastering*
Gallagher & Munro Co. . . . *Plasterers*
Gurney Heater Mfg. Co. . *Hot-water, etc.*
Heliotype Printing Co. . . *Art Printing*
Jager Co., Charles J. . . . *Engineers*
Johnson & Co., H. A. . . *Portable Ovens*
Ledder, G. G. . . . *Drawing Instruments*
Marble Co., W. P. . . . *Brass Finishers*
Massachusetts Institute of Technology. *School.*
McKay & Woolner. . . *Contractors and Builders.*
Morrill & Whiton Construction Co. . . *Masons and Builders.*
Morris-Ireland Safe Co. . . . . *Safes*
Morse & Whyte. . *Artistic Wire & Metal Works.*
New England Tank and Tower Co. *Tanks*
Parks & Jeeves. . . . . *Blue Printing*
Perry, W. J. . . . . *Dumb-waiter*
Redding, Baird & Co. . . . *Stained Glass*
Robey-French Co. . *Photographic Supplies*
Ryan, William Curtis. . . . . *Insurance*
Samson Cordage Works. . . *Sash-Cord*
Shultz Belting Co. . . . *Leather Belting*
Simpson Bros. Corporation. . *Asbestolith*
Sleep, Elliot & King Co. . *Modelling and Ornamental Plaster.*
Spaulding Print Paper Co. . *Blue Prints*
Standard Fire-escape & Mfg. Co. . *Fire-escapes.*
Sturtevant Co., B. F. . . . *Fan System*
Van Noorden Co., E. . . *Skylights, Metal*
Whittier Machine Co. . . . . *Elevators*

Cambridge.
Goodhue, Harry Eldredge. . . *Memorial Windows.*

Medford.
Tufts College. . . . . *School*

Palmer.
Flynt Building & Construction Co. . . *Building Contractors.*

Worcester.
Algonquin Red Slate Co. . . . . *Paint*

MISSOURI.

St. Louis.
Washington University School Engineering and Architecture. *School*

NEW JERSEY.

Jersey City.
Dixon Crucible Co., Jos. . . . *Graphite*

Paterson.
Passaic Steel Co. . . . . *Structural Iron*

Perth Amboy.
Perth Amboy Terra-Cotta Co. . . *Terra-Cotta.*

NEW YORK.

Irvington-on-Hudson.
Lord & Burnham Co. . . *Conservatories*

Ithaca.
Cornell University. . . . . *School*

Jamestown.
Art Metal Construction Co. . . . *Metal Furniture.*

Long Island City.
Richey, Browne & Donald. *Ornamental Iron and Bronze.*

Mount Vernon.
Hartmann Bros. Mfg. Co. *Staved Columns*

N. Y. City.
American Tin Plate Co. . . *Roofing Tin*
Associated Expanded Metal Co. *Expanded Metal.*
Atlas Cement Co. . . . . *Cement*
Chicago Clothes Dryer Works. . *Laundry Drying Machinery.*
Deane, E. Eldon. . . . . *Colorist*
Elevator Supply and Repair Co. . *Electric Signals.*
Fisher & Co., Robert C. . . . *Marble*
Frink, I. P. . . . . *Reflectors*
Hayes, George. . . . . *Metallic Lathing*
Hecla Iron Works. . . *Ornamental Iron and Bronze.*
Herzog Teleseme Co. . . *Elevator Signals*
Jackson & Co., Wm. H. . . . . *Grates*
Jenkins Bros. . . . . *Valves*
Jones, T. W. . . . . *Vanes*
Lawrence Cement Co., The. . . *Portland Cement.*
Kinnear-Hood Steel Co. . . . *Radiators*
Motoroff Exhauster Co. . . . *Ventilation*
Mott Iron Works, The. . . . *Iron Work*
Neuchatel Asphalte Co. . . . *Asphalt*
New Jersey Zinc Co. . . . . *Zinc White*
New York Belting and Packing Co., Ltd. *Interlocking Rubber Tiling.*
N. Y. Metal Ceiling Co. . *Metal Ceilings*
Okonite Co. Ltd. . . . . *Insulated Wire*
Pitt, W. R. . . . . *Folding-Gates*
Quimby, W. E. Inc. . . . *Electric Pumps*

NEW YORK.

N. Y. City.
Rider-Ericsson Engine Co. . . . *Hot-Air Engines.*
Sargent & Co. . . . *Builders' Hardware*
Smith Co., H. B. . . . . *Steam Heat*
Smith & Co., Edward. . . . . *Varnishes*
Society of Beaux-Arts Architects, The. . *School.*
Thiele, E. . . . . *Portland Cement*
Truss Metal Lath Co. . . . *Metal Lathing*
U. S. Mineral Wool Co. . . . *Mineral Wool*
Warren Chemical & Mfg. Co. . . *Asphalt*
Williams, John. . . . . *Wrought Metal*
Yale & Towne. . . . . *Hardware (Art)*

Rochester.
Cutler Mfg. Co. . . . . *Mail Chutes*

Tenafly.
Richter Mfg. Co. . . . . *Tapestrolea*

Troy.
Globe Ventilator Co. . . . . *Ventilators*
Troy Laundry Machinery Co. . *Washing-Machines.*

OHIO.

Canton.
Berger Mfg. Co., The. . . *Metal Ceilings*

Columbus.
Kinnear Mfg. Co., The. . . *Steel Rolling Doors.*
Nelson Co., The C. T. . *Capitals (Carved)*
Ohio State University. . . . . *School*

West Cleveland.
Cudell, F. E. . . . . *Traps*

PENNSYLVANIA.

Ambler.
Keasby & Mattison Co. *Magnesia Covering*

Philadelphia.
French & Co., Samuel H. . *Mortar Colors*
Loomis Filters Improved System. *Filters*
Merritt & Co. . *Lockers (Expanded Metal)*
Morse, Williams & Co. . . . *Elevators*
Taylor Co., N. & G. . . . . *Roofing Tin*
The Edison Portland Cement Co. . . . *Portland Cement.*
Thorn, J. S. . . . . *Sheet Metal*
University of Pennsylvania. . . *School*

Pittsburgh.
National Fireproofing Co. . *Fireproofing*
Standard Sanitary Mfg. Co. . *Porcelain Enamelled Ware.*

THE AMERICAN ARCHITECT AND BUILDING NEWS

VOL. LXXXIV SATURDAY, MAY 14, 1904 No. 1481

CONTENTS.

A COMMITTEE of the graduates of the Massachusetts Institute of Technology, who are agitated by the renewal of the discussion of the desirability of arranging some scheme by which the efforts of that institution need not duplicate, or be duplicated by, the undertakings of cognate departments maintained by Harvard University, are busily engaged in securing signatures to a protest to be addressed to the corporation by these alumni. This illiberal and narrow-minded attitude is in a sense symptomatic of the differences that exist in the tone of the two institutions, a difference that is, or used to be, very noticeable to one who, after taking his degree at Harvard, elected to take his professional training at the Technology. If a complete "merger" were contemplated, through the operation of which the identity of one institution or the other were to be completely lost, active opposition and protest would be understandable at least, if not praiseworthy; but the identity and, in a degree, the autonomy of each institution is to remain unimpaired, in the event that the conference committee report that some form of partial merger is advisable. As the prime object of the coalition is to prevent waste and secure economy, one would think that, as that is one of the ends most persistently kept in view by the educational methods at the Institute of Technology, the movement would receive its warmest support from the graduates of that institution, as their training would better fit them to realize the possibility and effectiveness of the proposed economies. The economic waste of maintaining in such close proximity two great educational plants and staffs of instructors, such as exist in the Institute of Technology and in the Lawrence Scientific School, is too obvious to require discussion, and it is a real misfortune that sentimental considerations are bound to enter so largely into the discussion and possibly settle it, one way or another.

BUT even if it is decided to lay the matter on the table for the present, we feel that it would be regrettable that the Departments of Architecture of the two institutions — the oldest and the youngest of the leading architectural schools of the country — should not be brought together, not so much for the sake of economic as for professional gain. An art department too closely associated with an engineering school is an instance of matter out of place. This was distinctly the case with the Architectural Department of the Institute of Technology in its early years, and it is only since it has won for itself a semi-detached position, with its own building and essentially its own corps of instructors, that it has acquired the proper atmosphere of an art school. The fate of the department at Harvard has been happier, as it earlier secured emancipation, — in fact, it was born almost free, thanks to the enlightened stand taken by both President Eliot, of the University, and Professor Shaler, the head of the Scientific School. Still, here are two good-sized schools, each somewhat encumbered with unnecessary engineering affiliations and neither quite reaching the standard of a School of Fine-arts, such as that at Paris, and neither quite likely to reach it while kept in a kind of tutelage, through not being controlled by a special faculty whose sole concern it should be to foster its real needs. If the two departments could be united and erected into a separate college of art within the control of Harvard University alone, we believe that almost every one would feel that the real needs of the art of architecture in this country would be better served than they now are. The present situation has a peril in it for both institutions: the personal equation in the matter of instruction in any form of art is a concern of vital importance, and it seems to us plain that when the time comes that the staff of one department is immeasurably, or even considerably, superior in artistic capacity to the staff of its rival, even though the plant and equipment of the latter may be superior, then it will surely draw to itself probably the greater number of pupils, or, at any rate, most of those pupils who desire to practise the profession as an art and not as a trade.

IT is regrettable that it seems to have been impossible to maintain, in connection with the Louisiana Purchase Exposition, the spirit of cordial coöperation on the part of the creating architects and artists that made one of the most surprising features and agreeable memories of the World's Fair at Chicago and, in a lesser degree, of the intervening exhibitions. In fact, architects have been eager to take part in these affairs very largely for the sake of the broadening and elevating effect on themselves of the companionship and association into which the requirements of a real coöperation introduced them. The undertaking at St. Louis, unfortunately, has developed more or less friction, and some who were interested in the affair at first have found reason to resign; but nothing has been quite so unpleasant as the withdrawal of Mr. Cass Gilbert, to whom was assigned the designing of the Palace of Fine-Art, a permanent structure, which was originally intended to be the central and crowning feature of the composition. Mr. Gilbert now resigns his office in order that he may bring suit against the Exposition Company, in the United States Circuit Court, for upwards of forty-seven thousand dollars of unpaid commission, which he claims is due him, a claim which the authorities dispute. When the general scheme was altered so as to introduce as the central feature the Festival Hall, with the Terrace of States, cascades and flanking pavilions, which now practically hide the Palace of Fine-Arts, Mr. Gilbert asked to be allowed to design the Festival Hall so that he might not be altogether deprived of his expected share of glory, and we understand that part of his claim is for work done upon the Festival Hall, while the defendants seem to maintain that that building was not designed by him.

ALTHOUGH one may suspect that "local pride" rather than good morals plays the leading part in it, the current cathedral-building movement is a very interesting fad to be taken up by a rather irreligious generation,— of course we mean only that those without the pale, not within it, are lacking in the devotional spirit that led our grandfathers to build two or three large or small churches or meeting-houses in every town or village where as many as a hundred families lived within driving distance. If, for administrative purposes, the Protestant Episcopal — the name is to be retained a while longer — or the Roman Catholic Church finds it desirable to have a bishop, there is a propriety in furnishing him with a bishop's church, a cathedral that is, and it is matter for gratitude that the providing of cathedrals in this country was not embarked on with vigor at a time when there were very few practitioners in the country able to treat the architectural problem with reasonable success. Miss Walker's bequest to the Bishop of Massachusetts of a large sum for the building of a cathedral has, amongst other things, invited attention to the inadequacy of the bequest — large as it is — for its intended purpose, if the cathedral is to have a proper relative importance to the great structure now building in New York. This disproportion of means to ends has given rise to the suggestion that the proprietors of St. Paul's Church on Tremont Street, Boston, who a year or so ago declined a million and a half of dollars for their property, may now decide to sell the land and add the proceeds to the bequest now in the Bishop's hands, all to be used in building a Protestant Episcopal Cathedral of St. Paul

Entered at the Post-Office at Boston as second-class matter.

somewhere on Beacon Hill. The idea, all but the site, seems to us a happy one, — a cathedral should stand well clear of sky-scrapers and State-houses. St. Paul seems likely to be well honored, for it is rumored, just now, that Mr. James J. Hill is to build a Cathedral of St. Paul in the city of that name for the Roman Catholic Diocese of Minnesota, so that the same sort of rivalry that is at issue in England, in the guise of the Roman Catholic Cathedral at Westminster and the great Cathedral of the Established Church at Liverpool, is not unlikely to be duplicated in this country.

AMERICAN architects who seek to magnify their office, and incidentally increase their bank-account, by urging legislative bodies to mark them as set apart from others of their fellows, because of their superior qualities, ought to realize that if legislators can be made to do it they will certainly exact a *quid pro quo;* that is, they will inevitably increase the burden of responsibility upon them, a burden none too light as it is for conscientious men. They will do well to consider how strictly French architects are held to account under the Code Napoléon and should ask themselves, before clamoring for "license" laws, whether they wish to increase by many more the number of lawsuits in which they are now involved, as these will inevitably follow when the public learns that it can reach the architect over the contractor's back. We will help them to realize the danger of pressing the pace too fast by recounting the most impressive instance we have ever come upon of the way in which French law seeks to hold the French architect up to a standard of accomplishment impossible for many men to reach. The story is this: In 1893, M. Couret de Villeneuve, an architect, built for a client at Neuilly-sur-Seine a five-story tenement-house, and, as is not always the case, furnished each bath-room with a set bath-tub, the hot water for which was provided by a water-heater, the heating being effected by a gas flame. The apparatus was, of course, a patented one and was installed by the contractor for the plumbing, while the gas attachment was piped by the contractor for gas-fitting. The work was well done and these several heaters performed their functions to every one's satisfaction for four years, at the end of which time the owner severed his connection with M. Couret de Villeneuve and engaged a new architect to care for his buildings. A year later the second architect recommended that, as the original water-heaters, if not actually worn out, were not as effective as those of a later make that had recently come into the market, they should be removed and replaced by others. His advice was accepted and the new apparatus installed, but, naturally, without any consultation between the original architect and his successor.

ONE morning at nine o'clock, while the widow woman who rented one of the apartments was not at home, her apartment was visited by a son of hers who, even at that early hour, was grossly intoxicated. Finding no one at home to amuse him and probably having a hazy idea that a bath would help him to sober off, the young man, a journeyman plumber, retired to the bath-room, lighted the water-heater and adjusted himself comfortably in the tub. At seven o'clock in the evening his mother, noticing at length a peculiar odor, traced it to the bath-room where she found the young man nearly asphyxiated, his nostrils almost completely clogged by the smoke given off by the gas-jet which the young man, in his drunkenness, had allowed to burn with a white flame in place of a blue flame, according to the well-known instructions governing the use of such apparatus. After his system was cleansed of the inhaled carbon as much as was possible, the victim of the accident naturally sought revenge upon some one for the ailments caused by his own degeneracy, and first brought suit against the patentee and manufacturer of the water-heater itself, but lost his suit, as it was shown that the apparatus itself was in good order. His next suit, against the owner of the building, was no more successful, since it was shown that the original apparatus and its successors were put in under the care of two different architects, as the owner did not pretend to be skilled in such matters. In the third suit, in 1899, he joined as co-defendants the gas-man, the plumber, and not only the second architect but also M. Couret de Villeneuve, the original architect. Finally, in November, 1902, the Tribunal discharged the plumber and the gas-fitter, on the ground that they had merely carried out the architects' specifications. As to the other defendants, the two architects, it was decided that the accident was made possible owing to three facts: first, the cone leading to the exhaust for the escape of the gases of combustion did not fit tight, but left an opening of some ten centimetres; second, the outer end of the exhaust finished flush with the surface of the wall, instead of being carried up to the roof, and third, no fresh-air inlet had been provided for the bath-room or the passage from which it opened. Disregarding the fact that this apparatus and four others in the same building, all of the same make and adjustment, had been used safely and satisfactorily for five years, the Court sentenced the two architects, as jointly responsible, to pay the drunkard five thousand francs, declaring that the original architect was responsible for imperfectly installing the original apparatus and that the second architect was equally liable because he had not been bright enough to note and correct the blunders made by his *confrère.*

AN American or English judge, we fancy, would have thrown such a case as this out of court before it was half heard; but in France they do things differently, and the architect especially has a hard time. Fortunately, common-sense and justice can be found even in a French tribunal, if one but have courage, perseverance and money, as our two architects had, and we find that in June last the Cour d'Appel reverses the decision of the lower court, remits the fine and condemns the original plaintiff to pay all costs. The decision declares that, of all men, the victim of the accident had least right to complain, for, as a plumber, he must have installed such apparatus and known that a blue not a white flame was needed, and, moreover, it was shown that he had actually been employed to repair some of these water-heaters in this very house. As to the adjustment of the exhaust tube and its outlet, it was a sufficient defence to have proved that practice varied, some experts preferring one method and others another, and, finally, the court declared that the bather was merely the victim of his own imprudence. The case is impressive as showing how, under the Code, responsibility still rested upon the original architect for an accident happening in or to his building within the period of years during which the Code declares his financial responsibility shall endure and this, too, although as professional adviser to the owner of the building he had been replaced by another architect. From the time a French architect enters practice for himself until long after he is dead, it is not possible to know what portion of his estate is unincumbered or reasonably sure to be transmitted to the heirs of his body.

THE Hotel Darlington disaster seems likely to produce some good in compensation for the cruel sacrifice of life it caused. The latest result is the issue of an order by the Superintendent of Buildings in Brooklyn requiring that, after May 1, all plans for building operations must be filed with the Department in duplicate, each embodying whatever corrections may be required before the granting of the permit. One of these sets, naturally, will be kept on file in the office of the Superintendent, while the duplicate set must be kept on the job, so that it may be at all times accessible to the district inspector. It is strange that, in these days of easy duplication by blue-printing, it should require a serious loss of life to make plain the advantage of so very elementary a precaution. With official copies always in easy reach, an inspector should have no difficulty in checking off weights, sizes and shapes; and there clearly will be less chance of graft, even if contractor and inspector should be willing to give and take a bribe, seeing that in the inevitable handling of these duplicate plans on the job more or less of the intelligent workmen would become familiar with them and so be able to report any deviation at headquarters, if they should think wise to do so.

SINCE it appears that appeal for a pardon for the notorious Sam Parks, on the ground that he was a dying man, was based on fact and not on fraud, many people will regret that the last days of the poor wretch were passed in confinement in the hospital of Sing Sing Prison. But apart from that, his death can but make more impressive the lesson of his deserved punishment. It is discouraging, however, to note how little effect on laboring men is produced by the fate of their most idolized leaders. Denis Kearney, Martin Irons, Sam Parks, held the centre of the stage through violence for a time, and then disappeared. Debs still struggles to the surface in the preposterous guise of a Presidential candidate, but the very vote that is cast for him is the measure of his success as a labor leader.

THE RECONSTRUCTION OF FOUNDATIONS FOR THE HOTEL WOLLATON, BROOKLINE, MASS.[1]

SOME five or six years ago, the Hotel Wollaton, at 1070 Beacon Street, Brookline, Mass., was condemned as unsafe for occupancy, on account of the continued settlement of its foundations. This settlement began during the erection of the building, and continued year after year, with the result that the walls were thrown out of plumb and the floors out of level, and large cracks appeared in all parts of the building. For some time it remained empty and fenced off from the street, to protect the public from falling walls, if such collapse should occur.

The hotel has six stories, with twelve suites, and is approximately 80 feet square. The walls are of brick above, and of heavy stone below, ground, the whole resting upon ordinary pile foundations. The location is on low land, which might be called a "pot-hole." This lot had been filled, over a portion of the site, up to the level of the street or to about Grade 21. This was the state of affairs when the hotel became the property of Newhall Brothers, of Boston. The owners engaged French & Bryant, of Brookline, to devise some method of strengthening the foundations, so as to make the building once more habitable. The plans furnished the engineers were blueprints of the roof and the several floors and the framing plans; also records of the soundings. Before commencing on the description of repairs, it may be well to go back to the time when the first foundations were built.

The original piling plan showed about 1,000 piles, or treble the number used in the new foundations.

Rumor has it that while the lower walls were going up, settlements were noticed by the masons. Walls and floors, which were left plumb and level, were found to be out of position a few days after they were laid; and, as each successive story was reached, the floors were made level. This remedy was only temporary, and of its effects I will speak later. By the time the building was done, or soon after, it was feared the foundations were too weak, and some one tried to fix them by additional outside piles and steel beams, but as far as any material benefit to the foundations went this operation might have been omitted. Owing to changes in the original building plans, after some of the foundations were built, a great many piles were driven which were not loaded; these were uncovered, holes were cut in the walls, and through the latter were placed I-beams which rested on these idle piles. The beams were pinned off at the walls and became a part of the support. These beams were mostly 15 and 20 inches deep, and, in our work later on, we found some to be from 20 to 25 feet long, supporting the wall entirely. This made a very long span for such a concentrated load, causing a deflection in the beams of nearly a foot.

At the rear wall of the building, where the settlement was the greatest, the piles were capped by a platform of three layers of 6″ x 6″ hard-pine timbers, reinforced by a layer of concrete, the walls resting directly upon this structure. All these repairs proved futile and the building still settled, very slowly.

The foregoing sketch gives an idea of the conditions prevailing at the time we took hold of the work.

The first thing to be done was to examine the borings, seven in all, taken by the B. F. Smith Company.

These tests were not considered sufficient, and two 120-foot holes were made by the Brookline Waterworks to, approximately, Grade 100, the main purpose being to determine if suitable hard material was near enough the surface to make the use of iron piles economical. These tests showed that from Grade 30 to Grade 100 the material was sharp black sand, mixed at intervals with a little clay and gravel, until at the extreme depth it was so compact as to be almost impossible to drill.

This showed that iron piles would not be appropriate, and that the stratum of gravel at about Grade 25 to Grade 30 was the firmest for supporting the piles.

The following schemes were considered in the preliminary studies: —

1. Loading the building and moving easterly 40 feet where the soil was firmer.

2. Open-caisson method with some wood and some iron piles, the caissons proposed being 4 feet in diameter. This method would have cost at least $16,000.

3. Moving the building westward about 90 feet onto a temporary pile support, and while it was in this position lay new foundations, after which the building was to be moved back upon them. This estimate footed up to $22,000. This method was abandoned largely on account of the walls, which were so cracked that it was feared they would not be able to stand the journey. These estimates gave from $15,000 to $22,000, and, moreover, moving the building was considered a doubtful experiment.

4. The method finally adopted was to repair the foundations and level the building, but not moving it laterally. While the foregoing studies were under way a good many measurements were made. Levels were taken over the whole lot and plotted on a one-quarter scale plan. The building was closely measured on the outside and accurately plotted. The inside arrangements were taken from the building plans and verified by observation. Levels were taken on the first, second, fourth and sixth floors in corresponding positions and the settlements compared by floors. The settlements shown by the different floors agreed generally within a fraction of an inch, a portion of any discrepancy, no doubt, being due to doing the levelling on a floor and the remainder due to the manner in which the floors were laid. The easterly front corner was on comparatively firm ground and was assumed to have retained its original level. Whether this was so or not is of no moment, for we aimed to bring all other portions of the building to this highest level. The greatest settlement on any portion of the floor was 0.92 feet, or 11 inches. Its location was on the west side, about three-fourths the distance to the rear. From these levels the settlements were contoured every 0.05 foot difference in elevation.

In order to detect any settlements which might occur during the work, especially while pile-driving, small nails were driven at various points, both inside and outside the building. There were sixty-four in all; twenty-five being outside and thirty-nine inside. These were placed at salient points, such as angles in the walls, piers, elevator wells, etc. Before any work was commenced levels were taken on the telltales to the nearest 0.001 of a foot and the date noted. During the work levels were taken on these telltales at frequent intervals, sometimes daily, especially during pile-driving; the progress of the work being noted each time. These elevations were tabulated and constantly examined. In addition to these, some of the cracks in the walls were plastered with mortar. This latter method, although showing occasional settlement, was unreliable. By the table we could determine at all times the state of the walls and the chances of a collapse.

Measurements of all piers were necessary for the proper placing of piles, and also a plan of all iron beams in the first floor. These beams were placed every 4 or 5 feet through the whole floor, and the inside piles had to be located very carefully.

Location of Building. — Four offset lines were run parallel to the four sides of the building, at as short a distance away as practicable, and the ends thoroughly tied in. At various points, on the first and sixth floors, offsets were taken. The front side was found to be 0.15 to 0.20 feet out of plumb and leaning toward the rear. The back walls on the easterly portion leaned 0.19 feet toward the street, and on the westerly end leaned 0.46 feet away from it. The east wall leaned west 0.66 feet and the west wall leaned west 0.70 feet. The weight of the building, with live and dead loads, was calculated as 4,000 tons, and, by means of the framing plans, we were able to determine its proper point of application to the walls. This weight was taken in sections, about forty in all, and the necessary piles computed for each section.

The general plan of the new foundation is shown elsewhere. Spruce piles were driven outside the building and hard-pine piles, in sections, inside; the tops were concreted around and capped with granite. Upon the granite caps were I-beams, placed directly above the rows of piles; upon these I-beams were cross I-beams running from inside to outside of walls, and upon these last were a double row of beams, which carried the walls directly. All of these beams were covered with concrete. This is shown in the annexed detail.

The work of rebuilding was divided into three parts, as follows: —

1. The excavation, grading, sawing off piles, pumping and backfilling was let by contract to J. H. Sullivan. Bids for this work ranged from $3,000 to $5,200.

2. This contract included tying walls, loading and levelling building, driving piles, removing masonry and handling ironwork and boiler. This contract was let to Isaac Blair & Co., of Boston.

3. The owners thought best to do all rebuilding of masonry, cutting holes for beams, setting stone caps for piles, beams, carpenter work, etc., themselves, and this was done by various laborers, under the direction of a foreman accustomed to the construction of large buildings.

Work was commenced about October 20, 1899, both contracts being carried along together. The first work was to tie the walls of the building together on the second and fourth floors. For this purpose heavy iron rods, with turnbuckles, were used.

The first piles were driven October 23d. All piles were numbered and the penetrations recorded. It may be well to give a few words of explanation about them. I have previously mentioned how few there were compared with the original number. The ordinary loads given to the piles supporting buildings in Boston are 8 to 10 tons, while some of our piles were figured as having to carry nearly 50 tons. This loading was so excessive, that we searched pile-driving records to find a precedent. In *Trans. A. S. C. E.*, vol. 2, p. 155, was an article on pile tests made in Buffalo.

The conclusion drawn from these tests, among others, was that 1,000 pounds per square foot in clay, sand and gravel was conservative for downward skin friction for a static load.

The proper lengths of inside piles were worked out as follows: —

The portion of the load to be borne wholly by the inside piles was 3,000 to 3,250 tons. By using 100 piles inside this meant 32.5 tons per pile. By using hard-pine timber, 10 inches square, the friction area of the pile is 3.3 square feet for every running foot, or 3,300 pounds for the frictional resistance per lineal foot. The average load on a pile being 65,000 pounds, this gave 65,000 ÷ 3,300 or 20 feet as the necessary penetration in bearing soil.

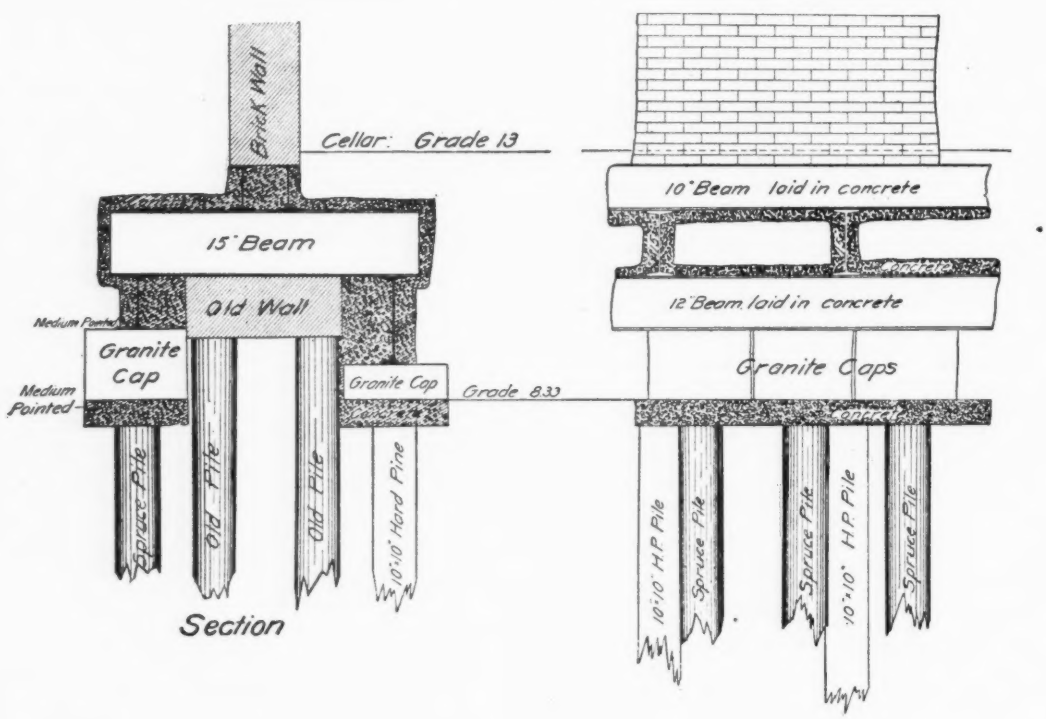
[1] A paper by DanaM. Pratt, Member of the Boston Society of Civil Engineers, read before the Society, February 4, 1903, and printed in the *Journal* of that society.

Keeping in mind that the first 25 to 30 feet was in very poor material, peat, in fact, we have 45 feet for the required length of pile; the outside piles, being more numerous, were called 40 feet long.

The first pile driving was done in front of the building where the filling was the greatest. This driving was done before any excavations were made and the diggers followed shortly. As the earth was removed the piles were sometimes found to be out of plumb and out of position, owing to their striking sunken logs. After this, the excavation, down to about Grade 10, the ordinary water level, was done in advance with better results. Owing to the very ragged original foundations and other obstructions the piles could not always be driven where desired, and this is shown in the poor spacing and ragged lines shown in the plan. This also necessitated the use of caps in many cases, and on this account it is quite possible that some outside pile loads reach 50 tons.

The pile driving outside was done with a Warrington steam hammer of the Nasmyth type. The hammer was made by the Vulcan Iron Works, of Chicago, and consisted of a frame supporting a steam cylinder, to the piston of which is attached a heavy cast-iron ram. This whole apparatus rested directly on the pile top; the ram travelled 19 inches and struck sixty to eighty blows per minute, and the pile was practically on the move all the time and the jar reduced to a minimum. The total weight of this ironwork resting on the pile was 6,500 pounds, the weight of the ram itself was only 1,700 pounds. This hammer had to be kept well oiled, and at first the steam exhaust scattered the oil to the sides of the building, discoloring the light brick to a yellowish brown. It was, therefore, found necessary to protect the walls, and a canvas of large dimensions was hung from the walls. Taken all in all, the pile driving was perhaps the most interesting part of the whole procedure. The outside pile driving commenced October 23d and ended December 7th. There were 173 of these, and they were all spruce, furnished and driven by the contractor for $6 per pile of 40-foot length. Seventeen piles were spliced with a spruce stick and twenty-three were spliced with the hard pine 10″ x 10″ stick, used inside the building. For all spliced piles the contractor received double pay; this, of course, was more than they were worth as compared with single piles, but as the latter were driven at a loss, it was thought best to be liberal. Nineteen of the piles were cut and furnished by the owner from trees cut on his own estate. These were, of course, green, and were in some cases 2 feet in diameter at the top. The total weight to be supported by these piles was about 1,500 tons, making on the average 9 tons per pile, with probably no pile carrying more than 12 or 15 tons. The contractor, though not engaged in the pile-driving business, found that he could drive them cheaper than he could sublet them to other contractors. They were probably driven slower, but, no doubt, far better than if by a subcontractor. The force necessary was a foreman, engineer and seven or eight men. The greatest number of piles driven in any week was forty-two. This seems a small number compared with other work, but owing to the presence of the building the moving of the apparatus was slow. From notes taken of the men's time, etc., it would seem that $8 per pile was a fair price for piles driven in good shape under such conditions. The general scheme for the position of piles was 22 inches from the face of the brick walls, but the lower portion of the wall, being built of heavy blocks of granite, often gave trouble by the projections of the latter, and in many cases the piles had to be moved and almost wedged in between the building stones and driven with a follower to get them down. In this case 24 or 25 inches from the brick walls would have been cheaper, although taking more iron. As fast as piles were driven they were sawed off and capped. The grade for this cutting was 8.33 above low water, while a few piles, which were to have wooden caps, were cut at Grade 7.5. A few idle piles were found in the line of our new ones and were capped and used, although it is doubtful if they were of much benefit.

Inside Piles. — These piles were to be driven inside an existing building and the problem was different. The specifications called for piles made of 10″ x 10″ long-leaf hard-pine timber, in 15-foot sections or lengths, spliced together with iron bands or sleeves, and it was estimated that three lengths at least would be everywhere used, and in the softest places, four. These specifications were followed, and only first class timber was used. There were about 3,000 tons to be borne by the inside walls and 98 piles were used. This made 30 tons at least for the average loading per pile, and in two cases our computations showed that 46 tons would be the actual load. In a few cases, as around piers, 6 tons was the computed load. All piles were numbered, and, after sawing, were tied in. When any inside pile was to be driven the notebook showed the load to be borne, and special pains were taken with the driving in case of the heavily loaded piles. It was the original intention that the inside piles should also be driven with a steam hammer, as it was thought that better work would be done, but the contractor raised the objection that the escaping steam would spoil all the walls of the building. The real reason, without doubt, was that the steam hammer had given him occasional trouble, and, moreover, was exceedingly heavy to move about in this restricted space, besides the care of the escaping steam by a proper exhaust through the windows. We yielded the point, however, on the contractor's guarantee to drive the piles to the same depths with the drop hammer.



Work on the inside piles was begun December 10th, and was finished February 1st; the force of men employed was the same as when working outside. Before work was commenced, the finished work of the lower fireproof floor was taken up, and holes 4 or 5 feet square were cut in the brick arches vertically above the pile, likewise a hole 4 feet square was dug below the cellar floor and excavated to tide water, the pile-driver was then set up and the first section driven. When the first 15 feet had been driven, the pile sleeve was placed on the head and pushed into place by the hammer. Before driving the next stick a saw cut was made around each end, then placed in position on the sleeve below and pushed into place by the hammer. The longest piles were 60 feet and the shortest 37½ feet. In one case an old pile was found in line of our new one and by followers was driven down to a proper grade. Four piles were all that could be driven in one day, under a contract price of $15 each, which entailed a loss to the contractor. From notes of the number of men employed, I have estimated that there was a loss of about $6.50 per

pile, making $21 to $22 a fair value for such piles furnished and driven.

The pile splices cost $1.24 apiece, and were furnished by Kendall, of Cambridgeport. Throughout all the pile driving the penetration under the last blows was taken. The method used was to wait until the foreman swore he couldn't drive it any farther and then have him take about ten blows. The division of the whole penetration by the number of blows was called the penetration of the last. The smallest penetration of the steam hammer was 0.01 inch, being the average of forty-five blows; the greatest being 1 inch to a blow; a fair average being fifteen blows to an inch. With the drop-hammer the smallest penetration was $\frac{1}{4}$ of an inch and the largest $1\frac{1}{4}$ inches; a fair average being $\frac{5}{8}$ to $\frac{3}{4}$ of an inch. Nineteen feet was the maximum drop of the hammer. During the latter part of the inside driving two separate gins and hammers were used; one being used for driving, while the other was being erected for the next pile, and thus the only delay was a few minutes to transfer the lead rope. These inside piles were nearly all driven with a short follower.

In the back part of the building it often took a laborer two days to get a hole cut through the old timber platform below the walls. Outside spliced piles were dowelled together with a 2-inch angle-iron 8 inches long.

I have previously mentioned the exceptionally heavy loads to be placed on many of the piles. Although we felt safe, we could not help thinking of them, and the owners were induced to purchase for testing purposes an hydraulic jack, of 100 tons capacity, costing $125. This was of Watson-Stillman make, with 4-inch motion and 9-inch base, the pump for cold-weather use taking a mixture of 40 per cent alcohol and 60 per cent water. We made six tests with the jack, covering different conditions.

In figuring safe loads, the *Engineering News* formula was used, thus: —

$$L = \frac{2\,w\,h}{s+1} \text{ and } L = \frac{2\,w\,h}{s+0.1}$$

Where "L" is the load and W the weight of hammer, both in pounds, "h" the fall in feet and "s" the penetration in inches under the last blow, a statement of the various tests which were made follows: —

Test No. 1. *Pile No.* 100. — This was on a green spruce outside pile, 40 feet long, penetration 0.2 of an inch under the steam hammer. The formula gave 10 tons as a safe load, while the actual load was figured as 11 tons. This test began at 11.30 A. M., with a load of 25 tons, and was continued at 12 M., with a load of 30 tons.

From 1.30 P. M. to 3 P. M. the load was 35 tons; from 3 P. M. to 5 P. M. the load was 40 tons, when the test was stopped. During the test no displacement of the pile was noticed.

Test No. 2. — This was done in a spliced spruce outside pile, driven with a steam hammer, penetration 0.2 of an inch, and was tested with a load of 50 tons. No settlement occurred.

Test No. 3. *Pile No.* 127. — This was a spliced spruce outside pile, the lower section being 40 feet and the upper 25 feet long, driven with a steam hammer, with a penetration of 0.2 inches. The jack was placed on top of the granite pile cap, and upon the application of 35 tons the pile cap settled and continued to settle until a load of 60 tons was reached. At the time this test was made there was no concrete about the granite cap, and it was at first thought that the pile might have moved; later, it was decided that this apparent settlement was simply the compression of the fibers of the pile, as in test No. 4.

Test No. 4. *Pile No.* 122. — This pile was a spliced spruce outside pile, the lower part being 42 feet long and the upper part a hard-pine stick, 10 inches square and 15 feet long, driven with a steam hammer. Computed safe load, 24 tons. The jack was placed on the granite pile cap as before. In this case the cap was surrounded by concrete. The results were as follows: —

Load.	Settlement.
20 tons	0 inch.
26 "	0 "
40 "	$\frac{1}{32}$ "
52 "	$\frac{1}{8}$ "
60 "	$\frac{3}{16}$ "
77 "	$\frac{1}{4}$ "

The test was then stopped and load removed. When all but 20 tons had been taken off, the stone cap on the pile head came up, indicating that the pile itself had not moved, but the fibers of the pile were compressed, or that perhaps the joints had closed a trifle.

Test No. 5. *Pile No.* 12. — A hard-pine pile, 45 feet long, driven with a 2,000-pound drop hammer, drop 18 feet and penetrations $\frac{1}{2}$ inch. Safe load, 24 tons; load which piles must carry, 46 tons. In this case the test was 50 tons. No settlement occurred.

Test No. 6. *Pile No.* 35 — Hard-pine pile, 45 feet long, driven in three sections with 2,000-pound hammer, penetration 0.7 inch. Safe loads, 21 tons; load which pile must carry, 46 tons.

Time.	Load.	Settlement.
1.30 P. M.	10 tons.	0 inch.
1.50 "	30 "	0 "
2.00 "	40 "	$\frac{1}{8}$ "
2.15 "	50 "	$\frac{1}{4}$ "
2.40 "	60 "	$\frac{7}{16}$ "

When the load of 60 tons was applied, the loading beam buckled and released the load, after which a net settlement of $\frac{1}{8}$ inch showed.

The results of these tests were very satisfactory, and indicated the piles were safe under any load we expected to put upon them.

Sawing Off Piles. — The contract price for sawing off piles was 20 cents. It cost the contractor about 50 or 60 cents. This was due to the small space in which the men worked, the narrowness of the trenches, the fact that many piles were driven hard up to the walls, and also that the men worked part of the time in the water.

During the time occupied by the driving of the outside piles, the largest settlement noticed by telltales was $\frac{5}{100}$ of a foot in the back end of the building.

On February 1st, or after all piles were driven, the largest settlement on the back was $\frac{9}{100}$ of a foot; the largest settlement on the inside was $\frac{7}{100}$ of a foot.

Granite Caps. — Every pile was capped with granite blocks with their tops and bottoms medium pointed. The depth varied from 8 to 28 inches, with $\frac{1}{4}$ inch allowance for joints. The reason for the variations in depth was that the iron beams above were of varying sizes, and it was necessary to set the tops of the middle tier of beams at the same level. Practically, all the stones were 2 feet square, and prices on furnishing and delivering these stones varied from $525 to $675. The contract was awarded to Field & Wilde, of Quincy, for the former sum. This price was later reduced to $500, provided the engineers would not be too particular about the "looks" of the stone. These stones, where possible, were bonded to existing masonry by concrete. For the proper bedding for the iron beams it was necessary that the tops of the stones should be level. This was not always the case, and a stone mason often had to point a trough through the top for a width equal to the flanges of the beams. The cost of such pointing was $30. This, in the end, was cheaper than using a more finished quality of stone. These stones were easily handled by two men with a bar, and were lowered into place with a differential pulley. As fast as the stones were set, the piles underneath were located on the stones and marked with a cross of black paint. These stones when set were all bedded in concrete, and where they were near together the spaces between the edges were also filled.

ITEMIZED COST OF CAPPING PILES.

258 stone caps	$500.00
265 piles sawed, at 20 cents	53.00
Dressing stone	35.00
Chain falls	21.00
Laborers	168.40
Mason	96.39
	$873.79

Or about $3.40 per pile.

Exclusive of pumping and concreting, a mason and tender could lay fourteen stones per eight-hour day.

Concrete. — The gravel concrete used for this work was mixed 5 : 3 : 1. The first cement used was Krouse's. This was very slow setting, and we soon changed to Atlas. The concrete was wheeled out on stagings and allowed to be dropped about 10 feet into position. Gravel and sand for this work cost $1.30 per cubic yard, delivered.

Steel Work. — The total weight of steel beams for which bids were asked was 118,698 pounds, nearly 60 tons. Specifications were sent to ten representative companies, and the contract awarded to the Phœnix Iron Company, for 1.675 cents per pound, f. o. b. Huntington Avenue, Boston, from which yard they were teamed by the R. S. Brine Company for 59 cents per ton.

All iron beams were painted with two coats of red lead and were perfectly plain, without punching or drilling. There were three tiers of beams: —

First. — The girders forming the lowest course and resting directly along the pile caps. These acted as continuous girders and their size was not figured. These, in general, were made 12 inches deep, which seemed reasonably safe, especially as each beam was bedded in a 12-inch strip of concrete. Similar beams on the inside could be computed as a simple beam with one or more concentrated loads. These beams varied from 12 to 20 inches in depth.

Second. — The cross beams, supported by the former and extending from the outside through the walls to the inside. These beams were all computed, and for the outside walls made 15 inches. Weights, 42, 50 and 60 pounds. These beams were likewise bedded in the concrete. At the main corners of the buildings these beams were laid double or even triple, with the edges of the flanges at least $\frac{1}{2}$ inch apart, to facilitate the grouting.

Third. — The longitudinal beams resting on the cross beams were laid in pairs, the extreme edges of the flanges being flush with the edges of the 16-inch wall, the space between them being filled with concrete. These were all light, 8 or 10-inch beams, and directly supported the wall above.

The first beam was set January 15th and the last not until some time in March.

The steel beams began to arrive about the middle of January, and the work of setting them commenced at once. This was the building mover's contract. The price for this was $500. This was done

at a profit to the contractor, as, taken in conjunction with his other work, it probably cost him from 50 to 75 cents apiece, or not more than $150 for the whole. The work of bedding them was done by the owner. The first beam placed was on January 15th, after one-half of the inside piles had been driven. These first beams were, of course, the long one upon the pile caps. These were easily handled, the only particular work about them being the proper placing. The axis line of the beam was made to fit an average line through the centres of the piles. After these beams were in place, the position of the cross beams was marked on the top flange of the former with black paint. At these points was also marked the number of the beam. The setting of the cross beams was more difficult. Holes were cut through the wall wide enough to admit of their passage. They were then bedded in cement and surrounded by concrete. Before many of these were placed the contractor had started to build his blocking; where this was done in advance of the beam laying, holes were left between the crib-work at all places where the cross beams were to go. This setting of the top beams was not done until after the building was loaded. They were then run in between the bilge ways and easily placed.

During the progress of placing the steel we found the original iron support work constantly in the way. Where this was the case it was cut off. In most cases this did not weaken the existing supports. The cost of cutting this old iron was $206. A great many of these odds and ends of beams were used in place of new ones ordered for our work, and their value more than paid for what labor was done upon them; in fact, I may say where an old beam could be used and was available a new beam was not used, and, after completion of the work, the owners had for sale several tons of unused steel. It may be thought that the engineers could have foreseen the fact that the old beams could have been used, but it must be remembered that they were all buried several feet under the ground and their reliability was uncertain. They were carrying, or supposed to be carrying, part of the wall, and it might be unsafe to cut them out at the time they might be needed.

The loading of the building was begun January 28th, and was finished ready to raise February 19th. This was done in the same general manner as in other buildings, and the process of raising was immediately commenced, and lasted perhaps a week or ten days. There were in use between 700 and 800 jacks, each of 4 or 5 tons capacity. The maximum force used on this part of the work was about sixteen men. Each man was given charge of a certain number of jacks. At the sound of a whistle each one was given a quarter turn. The general appearance of the wall and blocking was noted, and, if all was well, this process was continued until the desired lift had been obtained. Levels were taken every day while the raising continued, the bottom flanges of the beams in the first floor being taken as a guide. Either lanterns or bicycle lamps were necessary for levelling done at this time in the cellar. In all cases the instrument was perched upon the blocking and the levelling rod inverted.

As fast as certain sections of the first floor were levelled the walls were pinned off, and, four or five days afterward, the needles were withdrawn. It is interesting to note that the heavy middle wall was the cause of much of the original settlement, and this was the only portion which gave any trouble in raising. Among other troublesome things was the necessary work around the boiler, which was accomplished without removing it from the room.

After the raising was complete, the offsets to the building were taken from the original base line These measurements showed that the front wall is almost exactly plumb. The back wall, which was in the worst condition, is all right in spots and in places 2 inches out. The side walls are in places all right, and at the worst spots are but 2 inches out of plumb. Portions of the wall with big cracks were rebuilt.

The work was completed without injury to the workmen from falling walls and other débris, and our portion of the work was finished in April, the total cost of work under our direct supervision being about $20,000.

A great deal of credit is due to Isaac Blair & Co. for the careful and workmanlike way in which they fulfilled their contract.

It is interesting to note that more lineal feet of piles were used in the original foundations of this building than was necessary to properly carry it.

The fact most apparent from this work is, perhaps, that such piles will stand an excessive load of 35 to 50 tons, if well driven and if the spacing is, say, 4-foot minimum.

DISCUSSION.

MR. HENRY F. BRYANT: — The preceding paper has set forth the facts accurately and in considerable detail. I can add but little, but will state what seem to be the main points of interest.

This building was in such bad shape that only a few of its apartments had been occupied, and those had been vacated by order of the public officials, who felt that collapse was sufficiently near to require that the street in front should be fenced off for half its width, to prevent injury from falling walls.

This serious condition was unquestionably due to the use of too short piles, penetrating only a foot or two, if at all, into the soft sand below the peat. It is difficult to understand how architect or builder could permit such construction, but it was apparently a case where the architect, in making his contracts, had not sufficiently informed himself of the conditions to be met and had failed to exercise proper supervision of construction. The builder failed to properly watch the pile driver, who, under a lump contract, cared nothing for the quality of his work.

While in this serious condition, with the property in the hands of the mortgagee under foreclosure, and for sale for but little more than the value of the land plus the building materials, the present owners took advice from many sources regarding the possibility of repairs. Practically all advice was unfavorable except ours, and as such advice was what they desired to get, they naturally accepted it, especially as it confirmed their own opinion as experienced and conservative men.

It took some courage to do this and to clear off all the labor liens and other charges, which amounted to a considerable sum.

That the undertaking was a troublesome and dangerous one can be inferred from the statement of the contractors, Isaac Blair & Co., who have done most of Boston's difficult building-moving and like work, that it was the toughest proposition they ever met.

There was a strong temptation to do this work differently; that is, to move the building to one side, put in new foundations and replace it. The expense would have been about the same but the details much simpler. What was feared was that it would be impossible to support such a heavy structure on the existing filling under. laid by peat without constant settlements and cracking of walls.

I must say that our later work indicated much greater supporting power in the peat than was anticipated, although at no time was the whole weight on the blockings resting on fill alone.

The only uncommon features of the work were the interior heavily loaded spliced piles and the use of iron below water level in close proximity to a peat formed in brackish water.

Spliced piles must, of course, be laterally weaker than single sticks, and we endeavored to place the splices within a few feet of solid earth, either original or filled. By using squared hard-pine timber, we failed to note any evidences of anything but vertical driving in a straight line, or of the displacement of one stick from another.

The tests, which might be criticised as being only of short duration, failed to show any evidence of settlement or other motion of the interior piles, and that under very unusual loads.

We were led to attempt this loading from the collection and study of the reports of a great many engineers from all over this country and abroad. It became evident to us that, given a reasonably resistant soil with no underlying soft clay, loads of 75 to 100 tons could be properly placed on good sturdy spruce or Norway pine piles with proper penetration, always provided they were not placed too near to each other, and thus exceed the compressive strength of the soil.

I am sorry we were unable to get more than 70 tons on any one pile, but the building was not heavy enough or the steel beams used were too weak for anything more.

For a similar building alongside, I should be willing to drive piles to carry 20 to 25 tons, and in so doing to save money over driving shallower piles at 8 or 10 tons each.

It has been asked how long the iron beams would last under the conditions now existing. This is not easily answered, as much depends on the quality of the peat, the rise and fall of ground water and the care with which they were painted, first with red lead and then with neat Portland cement grout, and also on the porosity of the surrounding concrete.

We attempted to have the coating, both of paint and cement, well put on and free from cracks or scratches, and the concrete was quite carefully laid to absolutely surround the beam. I do not think that the ground water is likely to fluctuate much from Grade 10, or that it will contain the salts which do so much damage to steel in ordinary peat. For instance, in some of the lower levels of Boston, Brookline and probably many other towns, lead service-pipes are the only ones to be used with safety, wrought-iron and, to an extent, cast-iron disappearing rapidly.

In my judgment, the iron beams will last long enough to keep the maximum fiber stress within the elastic limit for from fifty to seventy-five years.

Moreover, it will be noted from the section, that the concrete is in most cases so disposed as to serve either as a beam or an arch between the piles and should, with the help of the old foundations, support the building indefinitely.

At this time the building has been repaired some few years, and, so far as we can learn, has shown no sign of weakness, at any point.

EXHIBITION OF THE BOSTON ARCHITECTURAL CLUB.

THE exhibition of the Boston Architectural Club this year lacks a little of its customary fine flavor; not that it is not good and interesting, but rather that some of its predecessors have been exceptionally good. Further than this, the walls are not as well covered as usual, a fact that may betoken several things: a lack of perseverance and enthusiasm on the part of the committee, an unwillingness on the part of the architects of the neighborhood to exhibit, and finally, either a dearth of new work or the lack of some draughtsmen in the office force competent to make a show drawing. Perhaps the latter reason is the most plausible, if one may judge from the fact that so many of the drawings hung here have been rendered by specialists. In fact, a first look about the room makes one feel that he has stumbled upon a special exhibition of Mr. Gregg's work, so many drawings are there that have been prepared by his

skilful hand, and there is nothing more charming here in the way of rendering than some of his delicately and slightly tinted pencil tracings; they preserve all the qualities of an architectural drawing and add to it the charm of a water-color sketch which whittles away much of architectural formalism.

The change in fashion which, in the last few years, has caused architects to resort once more to the brush as a medium of expression has not resulted, as yet, in creating a body of water-colorists at all commensurate in capacity with the legion of clever workers in pen-and-ink who used to make architectural exhibitions so interesting a decade or more ago. There is not much in the way of color work to lend interest to this exhibition and, even if there were more and better examples, the depressing appearance of one of Mr. Schweinfurth's large drawings, a dormitory at Wellesley, and the altogether hideous tones and brutal handling of a large drawing from the office of Peabody & Stearns would be enough to shake one's memory of more agreeable subjects elsewhere on the walls. Quite the best bit of coloring, however, is a little sketch of an interior by Mr. C. M. Bill, warm, rich and strong in tone and handling and quite in the vein of Dutch work. And speaking of Dutch work reminds us that there hangs near by a charming little drawing of a scheme of mural decoration, by Messrs. Mortensen & Holdensen, which is both Dutch in subject and Dutch in feeling.

The committee is to be congratulated on the arrangement of the catalogue; it is the easiest one to use we have ever encountered, as the arrangement is completely alphabetical, and the numbers have been added after the grouping had been completed, not only in the proof-sheets but upon the walls, for the exhibition has the added attractiveness that the drawings of the several contributors are hung together so that, though not as isolated as if hung in separate alcoves, the several groups are easily distinguishable: the consequence of this is that the catalogue may be used to equal advantage for numerical or alphabetical reference.

Rather the place of honor is held by the drawings of Messrs. Francis R. Allen & Charles Collins for the Thompson Library at Vassar College and the new Woman's Hospital in New York, buildings which, as our readers already know, are thoroughly deserving of attention. So, too, is the design for the Ware School, Boston, by Messrs. Winslow & Bigelow, which hangs near them, the first venture, we believe, in this direction of a firm whose work has lain rather distinctively in the commercial field.

There are several designs for Government buildings hung, some merely competitive and others to be actually executed; but in no one of them is to be found evidence that the operation of the Tarsney Act has secured a more satisfactory design than would, in all probability, have been turned out by the designers in the office of the Supervising Architect. In fact, the designs for public buildings prepared during the incumbency of Mr. Taylor have been of such marked merit, and of so large a reasonable variety in style, composition and appropriateness, that the level of the regulation official performance has been raised to such a height that the private practitioner invited to prepare a design in competition has by no means an easy task before him, if he hopes to have his work notable for its superiority to the routine work issuing from the Government office. Of the designs hung, Mr. Schweinfurth's for the Providence Post-office is the best, while Mr. Wakefield's design for the Post-office at Nashua, N. H., may attract more attention because of Senator Gallinger's complaint that the job had been awarded not to a New Hampshire but to a Boston and, so, alien designer.

Mr. Taylor's name reminds us that there is no contribution from a namesake of his: nothing is here from the firm of Kendall, Taylor & Stevens, a firm that has specialized in the direction of hospitals and asylums. There is, however, a group of drawings and photographs, by Mr. William Atkinson, showing the Newport, R. I., Hospital, a group rather barren of architectural interest but obviously well arranged, economically constructed and well adapted to its uses. Perhaps the same may be said for the drawings that show the Salem Hospital, by Messrs. Dwight & Chandler, though here the merits of the arrangement are not quite so obvious.

There is one design shown that we regret is not to be carried out, and that is Messrs. Jenney & Frost's design for the Public Library at Marlboro, Mass., a design which has been considered not only from the position of the architect, but from that of the landscape architect as well, and the result is one we would very gladly see carried into execution. We do not know the exact character of the actual site, but the character given this design seems to fit it better for a place in a semi-rural town, such as Marlboro is, than the building actually to be erected by Messrs. Peabody & Stearns, which is shown in a drawing on the wall opposite and appears as one of the little structures of a Classic type that are to hand the name of Carnegie down to succeeding generations.

Of Carnegie libraries very few are shown, and the one that is most interesting, and a very good design it is too, is the successful competitive design for the Carnegie Library at Colorado Springs submitted by Mr. Calvin Kiessling, which promises to work out in execution with marked satisfactoriness. Mr. Carnegie has been instrumental in giving not a few young architects their opening into private practice, though how far they will be grateful to him later, when they have exchanged the pleasure of drawing salary as draughtsmen or assistant for the discomfort of attempting to act as paymaster to their former companions at the drawing-table, can only be told later.

There are comparatively few contributions from architects in other towns affiliated with the Club, the only one of marked importance being a series of small-scale working-tracings showing the elevations of half-a-dozen high apartment-houses in which Messrs. Israels & Harder have given marked attention to studying the color and texture of the brickwork, of which the façades are in large part composed. How far these efforts have been successful cannot be discovered, since the photographs of the finished building which are hung beside the tracings as an enlightening exhibit are, unfortunately, so small and so inferior that they really reveal nothing.

In the way of studentship work, the two Rotch *envoi* drawings by Mr. W. L. Welton, the misspelling of whose name is one of the few blemishes in the excellent catalogue, are admirable specimens of careful outline drawing. The three competitive drawings for the Rotch Scholarship executed by Mr. Foulkes last year are serious pieces of design and deserve approbation because of the sobriety expressed in this solution of the programme.

The drawings sent from Paris by Mr. Bellows were finally released by the Boston Customs officials, under some sort of bond, and so found a place in the exhibition after it was opened. Two at least of these little twelve-hour sketches had been awarded "first mentions" and the character of the designs show that the award was really merited. The competitive design for the Cathedral of St. John in the Wilderness at Denver, Col., by Messrs. Cram, Goodhue & Ferguson, is already known to our readers, so it may be readily understood that the wall where Mr. Goodhue's brilliant pen-and-ink work is hung is not likely to escape attention. Considered merely as an effect, it is particularly jarring to find these black and white drawings associated in one group with photographs and photographic enlargements of the reredos for St. James's Church at Philadelphia.

In the case of such a moderate sized exhibition as this, which is open for two weeks, would it not be possible for a really active hanging-committee to provide two essentially distinct exhibitions, hanging for the first week drawings mainly, these being enlightened sparingly by photographs of the completed work; while during the second week the walls could be covered with a photographic exhibit, sparingly emphasized and explained by small-size sketches and plans? It would be interesting to note whether the attendance were larger — no, it would be better not to practice self-deception, so we will say smaller during one week than the other.

ILLUSTRATIONS

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

MONUMENT TO GEORGE M. PULLMAN, GRACELAND, CHICAGO, ILL. MR. S. S. BEMAN, ARCHITECT, CHICAGO, ILL.

DETAIL OF THE SAME.

"EFFORT": MODEL FOR A GROUP AT THE LOUISIANA PURCHASE EXPOSITION, ST. LOUIS, MO. MR. L. O. LAWRIE, SCULPTOR, NEW YORK, N. Y.

"EFFORT": A FOUNTAIN, AND SKETCH FOR A MONUMENT TO DANTON. M. PIERRE ROCHE, SCULPTOR.

FINDING these illustrations in a recent issue of *l'Art et Décoration* we thought it would be interesting to bring together in this and the preceding plate the interpretation given by French and American sculptors to the same theme.

PLAN OF FOUNDATIONS OF THE HOTEL WOLLATON, BROOKLINE, MASS. MESSRS. FRENCH & BRYANT, ENGINEERS.

FOR description see article elsewhere in this issue.

CAR SHED, MANCHESTER, ENG. MR. JOHN GIBBONS, ARCHITECT.

THIS subject is copied from *The Builder*.

Additional Illustrations in the International Edition.

PALACE OF EDUCATION, RESTAURANT PAVILION AND CASCADE: LOUISIANA PURCHASE EXPOSITION, ST. LOUIS, MO.

BRIDGE IN FRONT OF THE MINES AND METALLURGY BUILDING: LOUISIANA PURCHASE EXPOSITION, ST. LOUIS, MO.

ADMINISTRATION BUILDING: LOUISIANA PURCHASE EXPOSITION, ST. LOUIS, MO. MESSRS. COPE & STEWARDSON, ARCHITECTS, PHILADELPHIA, PA.

ALTHOUGH actually temporarily used for the purpose indicated, this building is really one of the new group of buildings being erected for Washington University.

THE UNITED STATES GOVERNMENT BUILDING: FLANKED BY THE PALACE OF LIBERAL ARTS AND THE MINES AND METALLURGY BUILDING: LOUISIANA PURCHASE EXPOSITION, ST. LOUIS, MO.

NOTES & CLIPPINGS

STREET-CORNER GLORY FOR ARTISTS. — Paris has just named a number of its new streets after men who have won renown in art. The sculptor Maindron, the architect Emile Gilbert, the painters Vollon, Cazin, Galland and Dehodeneg, the latter a painter of portraits and Oriental pictures, who died in 1882. The commission which has the duty of naming the new streets of Paris invites suggestions from the public, so that within certain limits the names are selected by popular vote. In some of the German cities it has been decided that no living person shall have a street or square named after him or her, posthumous fame being the only reputation not open to sharp deterioration. Munich, which at one time went so far as to honor no person in this way until twenty years after death, has been generous in recognizing its painters, architects and sculptors. Dresden has honored many musicians, while Paris has been partial to poets. New York has so few streets to name, owing to the numeral system, that more than usual care should be taken here in this matter. — *N. Y. Evening Post.*

LIVING FOR IDEALS. — That was a wise old clergyman who urged his brethren not to admit young men to the ministry unless they were evidently more broad-minded and enthusiastic in their faith than their elders. "We must allow," he said, "for the inevitable shrinkage." The same allowance is necessary in every life for the sure closing in of the real upon the ideals of youth, and the unavoidable narrowing of hope and aim that must come with middle age. — *Harper's Bazar.*

PICKETING, LAWFUL AND UNLAWFUL. — Picketing may be lawful; picketing may be unlawful. Whether picketing is lawful or unlawful depends wholly upon the purpose with which it is carried on, or perhaps, it would be more accurate to say, the effect which is produced by it. If the purpose and effect are to intimidate, to interfere with the liberty of workmen in seeking employment, to interfere with what in another case I called the employer's right to have labor flow freely to him, so that a reasonably courageous person would be restrained from offering his labor to such employer, then picketing is unlawful, and, where the other necessary conditions for the interference of a court of equity exist, will be prohibited by an injunction. If, however, the picketing is carried on for the mere purpose of obtaining information, or for the purpose of conveying information to persons seeking or willing to receive the same, or even, in some cases, for the purpose of bringing orderly and peaceable persuasions to bear upon the minds of men who desire to listen to the same, the object of such persuasions not including in any way the disruption of an existing contract for labor, then there may be no unlawful element in the picketing, and carrying it on may found no action at law, and certainly may not call for any interference on the part of a court of equity. — *Vice-Chancellor Stevenson in the Court of Chancery of New Jersey.*

THE EXCAVATIONS AT HERCULANEUM. — A correspondent of the London *Times*, in a letter from Rome, gives some details of the latest scheme that has been broached for the complete excavation of Herculaneum. The proposition is that this vast work shall be carried out by the coöperation of Italy with all civilized countries, and that there shall be a central managing committee in Rome, with national committees elsewhere. The scheme, it is said, meets with the full support of the Italian Government, and is one which Dr. Charles Waldstein has advocated for some time past. He and Mr. Shoobridge are reported to be doing their best to put it into execution. As is generally known, Herculaneum gives promise of being a richer field of excavation even than Pompeii or any other ancient site. Since the first excavations of the theatre to a depth of twenty-seven metres below the surface in 1738, only partial excavations have been made — in 1828, 1837, 1853, 1869 and 1875. All these were upon a very small and tentative scale. Owing to the fact that the town of Resina covers the site, and other great natural difficulties, no excavation on a large or comprehensive scale has ever been attempted. These difficulties, the correspondent declares, upon what he believes to be good authority, have now been overcome; and he is informed that there is good reason to hope that satisfactory arrangements for defraying the heavy cost will soon be made. — *N. Y. Evening Post.*

A CYLINDRICAL DAM. — A dam consisting of a huge cylinder of sheet-steel that can be rolled or hoisted out of reach of freshets now spans the River Main at Schweinfurt, Germany. Says A. Steens, who contributes a description of this curious piece of mechanism to *The Scientific American*: "As the river is one subject to heavy floods, a type of dam that would permit a very rapid discharge of the freshet water had to be designed, and the cylindrical form, arranged to roll upward above the flood level, was adopted. . . . Briefly, it is a hollow cylinder of sheet-steel, on each end of which is fixed a toothed wheel which meshes with an inclined rack built in each abutment. The dam, as a whole, consists first of a sill upon which the cylinder in its lowermost position rests. This cylinder is 6.56 feet in diameter, and extends from shore to shore, a distance of about 35 metres (116 feet). When lowered, this enormous cylinder effects a rise in the river of 6½ feet. Among the conditions first established and under which the dam was to be constructed we find a section declaring that there were to be erected in the stream no piers or other supports that might interfere with the free movement of the ice in the spring. Not even temporary supports that could be removed upon the general breaking up of the ice or even at the close of navigation were allowed, simply because, in order to insure their stability, foundations or the like would have been necessary to sustain them, and these would become permanent obstructions likely to be damaged by freshets. The cylinder, in its lowest position, rests on a sill of oak, and the tightness of the dam at each end is provided for by a band of leather around the periphery. The pressure of the water holds the leather against the sill. . . . The weight of the cylinder is 193,600 pounds. The operating apparatus includes two steel cables of 1.8 inches diameter, each formed of six strands. The two cables are rolled on drums, and to raise the cylinder above high water (that is to say, 13 12 feet) an electric motor of eighteen horse-power is employed, and the operation takes less than a quarter of an hour. The mechanism is also provided with four cranks, by means of which the dam can be lifted by hand. The cranks drive a worm-gearing through chains, and this in turn meshes with a train of gears and a chain to the hoisting-drums."

MADAME DIEULAFOY. — One enjoying the entrée to exclusive circles in Paris is likely to meet at any time a couple before whom everybody gives way and whose appearance will profoundly impress the newcomer. "Professor and Madame Dieulafoy," the word is passed round. Surely there must be some mistake! That tall, well-built, fine-looking man with the gray moustache and beard, may be Professor Dieulafoy, but his frail beardless companion, dressed in an irreproachable frock coat and faultless trousers, cannot be his wife! And yet a more searching look at the refined and sensitive face, a single glance at the delicate tapering hands, suffice to dispel the illusion created by clothes. It is not only a woman, but one of the most womanly of women. Perhaps what causes Mme. Dieulafoy to be often taken for a man by those who do not know her is that she wears her masculine garb without affectation. She wears man's clothes not only because she considers them rational and convenient, but because she is thoroughly accustomed to wearing them, and acquired the habit in exceptional circumstances. Consequently short hair and ties and coats and trousers seem quite natural for her, because she is perfectly at ease with them. The first time that Mme. Dieulafoy dressed as a man she was far from intending to renounce feminine garments forever. In 1881 the French Government had entrusted Marcel Dieulafoy with an important archæological mission to Persia and Susiana, and Mme. Dieulafoy, whose tastes were literary, and who had always taken keen interest in archæological questions, decided to follow her husband. The results of their joint labor were of inestimable value to lovers of the antique, for they found the sites of the palaces of Darius and of Artaxerxes, and after five years of toil brought the principal vestiges back to the Louvre Museum in Paris. The work was filled with fatigues, difficulties and dangers, and Mme. Dieulafoy, after tearing her skirts on prehistoric stones, and tripping over her petticoats in Persian fields, decided that woman's dress was not devised for archæological pursuits. She envied the ease and immunity with which her husband moved about, and presently it occurred to her that if she imitated him in the wilds of the Orient no one would be the wiser when she returned to Paris. So one fine day, not suspecting that she was preparing a great decision in life, she cut her hair, donned a suit of men's clothes, and went to her work. For the first time she was free and happy, and accomplished so much that she decided to continue dressing as a man as long as she remained in Persia. But when she was finally ready to return to her Paris home she lacked the courage to resume what she had come to consider as the slavery of woman's dress. To face public criticism was far less trying an ordeal. For five years she had dressed as a man, and to dress as a woman seemed as antiquated and absurd to her as it would be for a London stockbroker to parade the city in a Roman toga. And she therefore filed a formal petition to the French Government, asking official authorization to wear man's clothes in future. Rosa Bonheur had received one of these rare permits and Mme. Dieulafoy received another. — *The Hour Glass.*

ANOTHER INDICATION OF THE WANING TIMBER-SUPPLY. — Timber receipts at Milwaukee by way of lake during 1903 fell off 30 per cent compared with 1902, and railway receipts in the same district increased. The timber must be hauled each year a greater distance to reach the lake ports, and the railroads are securing the business by lowering rates. — *N. Y. Evening Post.*

RECOVERY OF A RAVENNA MOSAIC. — In the cellar of the Kaiser Friedrich Museum, Berlin, certain old boxes were discovered not long ago containing broken bits of mosaic. They had lain there since the reign of Friedrich Wilhelm IV, the granduncle of the present Kaiser. On examination they proved to be a large mosaic of Christ surrounded by saints and female musicians, which was bought half a century ago from the Church of San Michele, in Ravenna. The mosaic has been put together and placed in a special room of the museum. It is not one of the ancient Byzantine mosaics for which Ravenna is famous, but still a good many centuries old. — *N. Y. Times.*

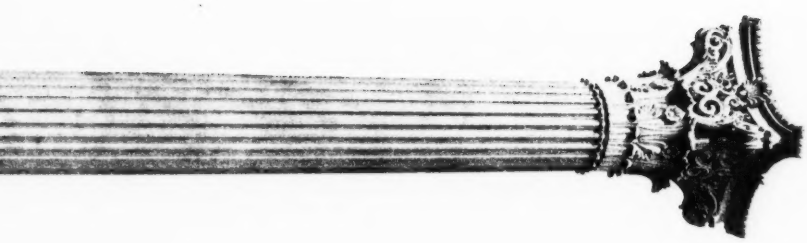
KING EDWARD'S HOLY CLOCK. — King Edward has a rare fraudulent clock. It was given to him when he was touring in India, and was said to have been made by a priest of the highest sanctity. It was a holy clock, and showed the hours in Sanscrit figures, the changes of the moon, and so on, and behaved itself as a well-ordered holy clock should. Some years after the internals went wrong, and the royal clockmaker was bidden to exercise his skill upon it. The works all bore the trademark of a well-known Clerkenwell firm! — *N. Y. Evening Post.*

EXTENDING THE GERMAN CANALS. — Five bills are now before the German Diet for appropriations of $100,000,000 for extensions, improvement of old and digging of new canals in the Empire. — *Exchange.*

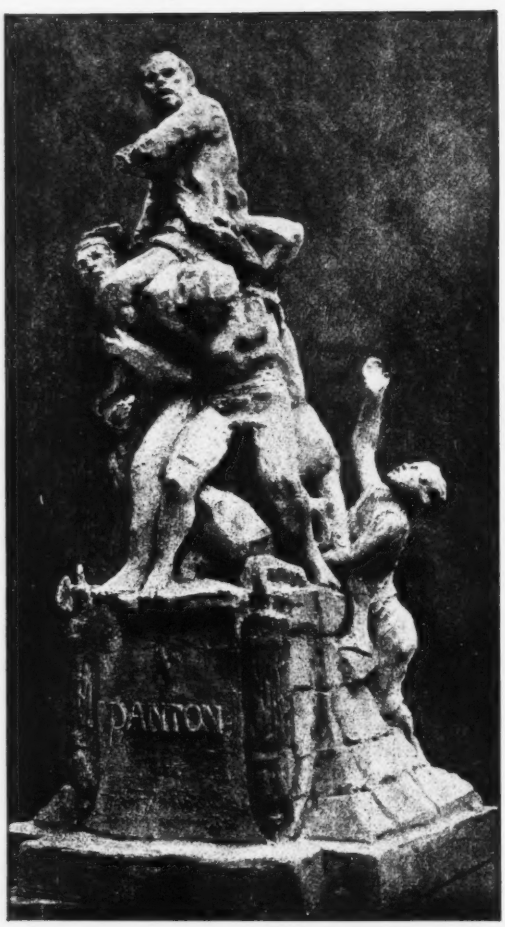
S. J. PARKHILL & CO., Printers, Boston, U. S. A.

HELIOTYPE CO., BOSTON.

MONUMENT TO GEORGE M. PULLMAN, GRACELAND, CHICAGO, ILL.
S. S. BEMAN, ARCHITECT.



"EFFORT"

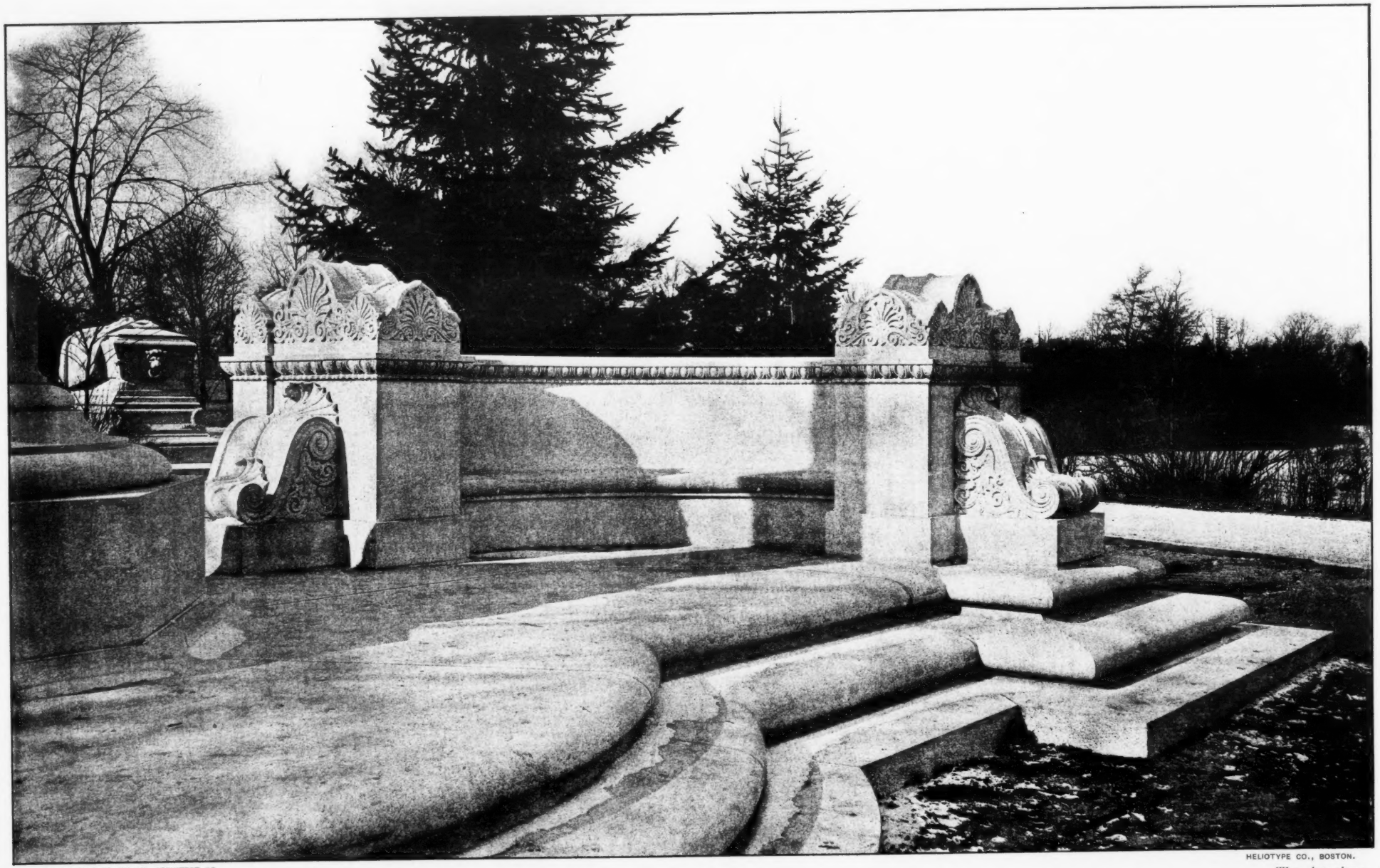


SKETCH FOR A MONUMENT TO DANTON.

From Art et Décoration.

SPECIMENS OF THE WORK OF PIERRE ROCHE, SCULPTOR.

The American Architect
May 14, 1904.
No. 1481.



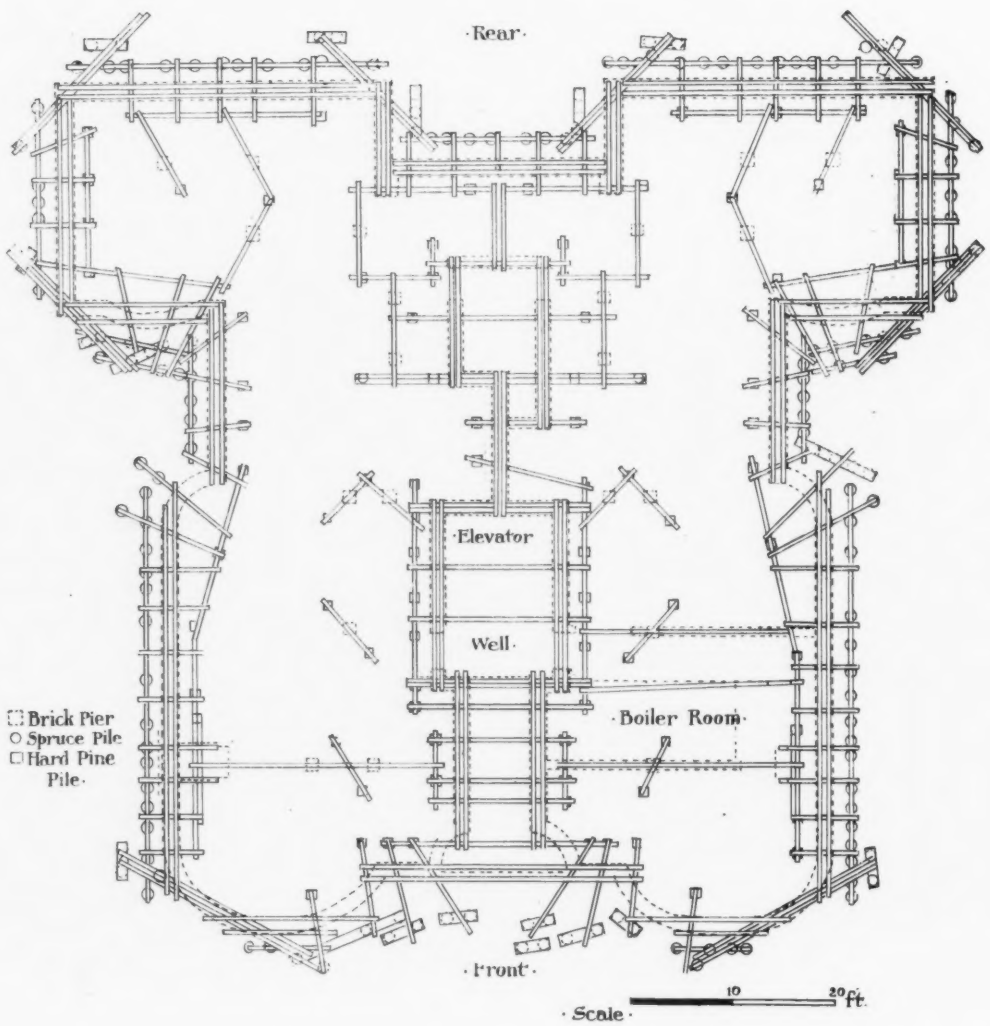
HELIOTYPE CO., BOSTON.

DETAIL OF MONUMENT TO GEORGE M. PULLMAN, GRACELAND, CHICAGO, ILL.

S. S. BEMAN, ARCHITECT.

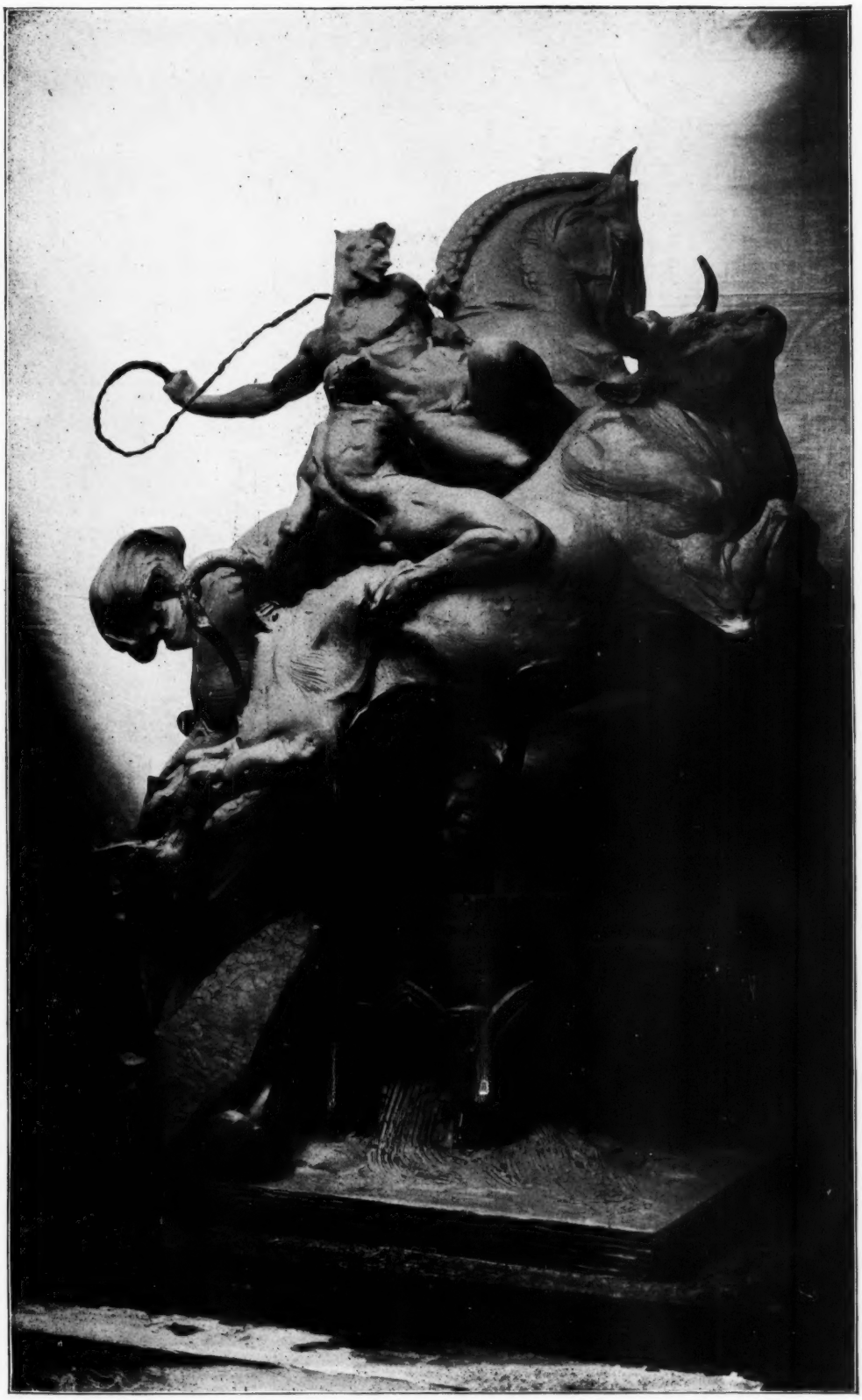
The American Architect
May 14, 1904.
No. 1481.

From *The Builder.*



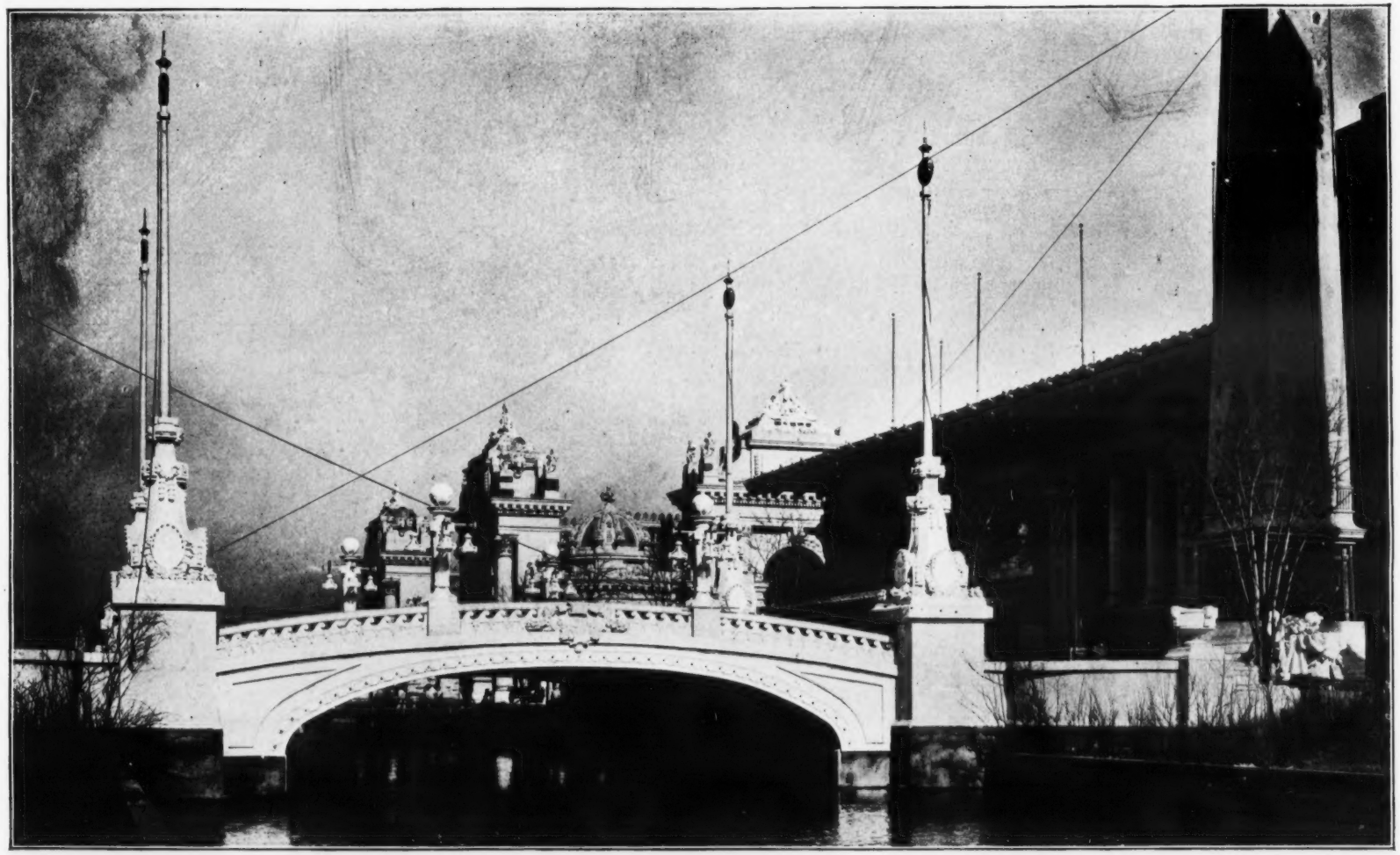
Plan of Foundation of "Hotel Wollaston," Brookline, Mass.

French & Bryant, Engineers.



"Effort:" Model for a Group at the Louisianna Purchase Exposition, St. Louis, Mo.

L. O. Lawre, Sculptor.



Bridge in Front of Mines and Metallurgy Building:
Louisiana Purchase Exposition, St. Louis, Mo.

The American Architect
May 14, 1904
No. 1481

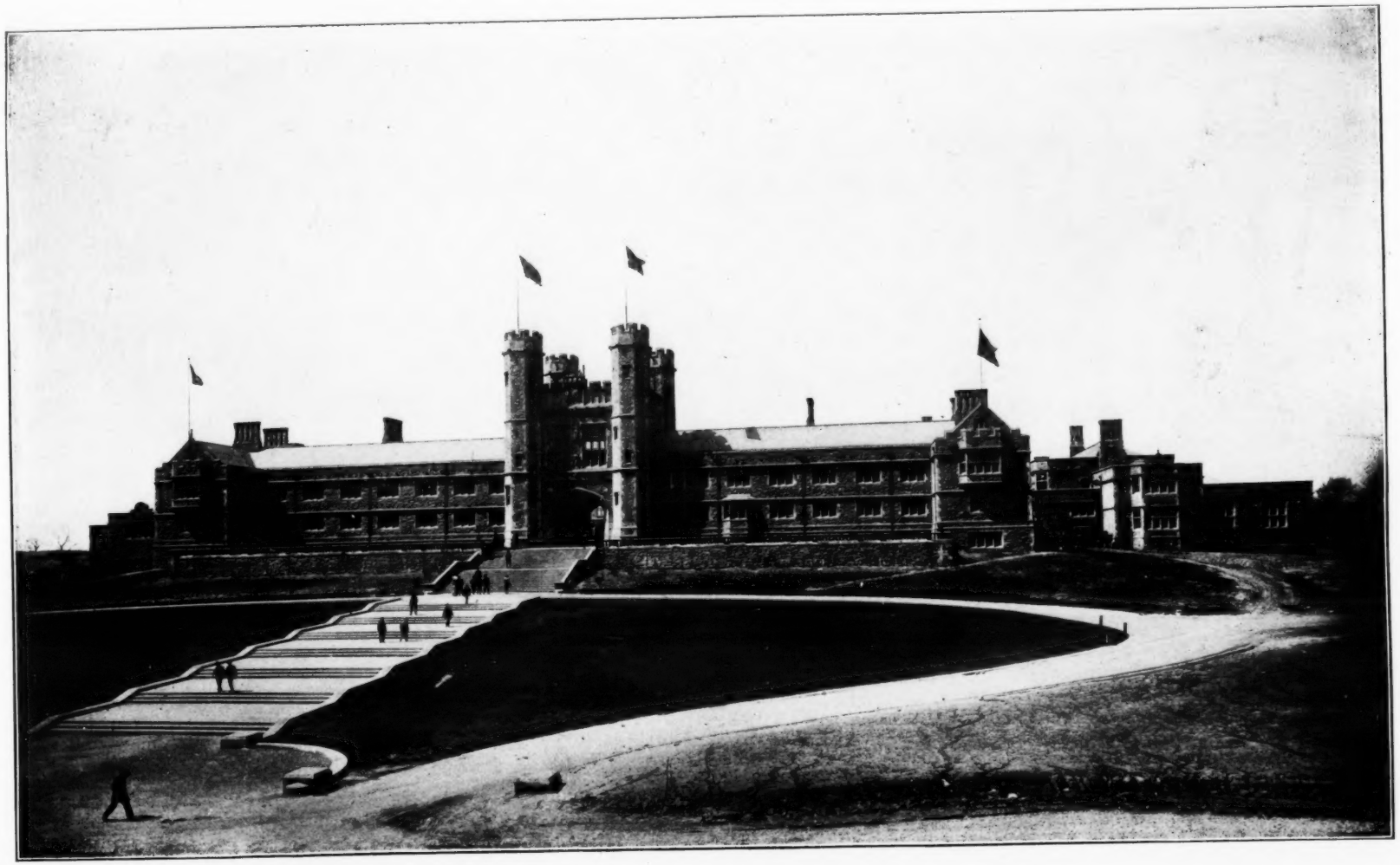
Palace of Education, Restaurant, Pavilion and Cascade:
Louisiana Purchase Exposition, St. Louis, Mo.

The American Architect
May 14, 1904
No. 1481

XUM

Liberal Arts Building; U. S. Government Building; Mines and Metallurgy Building,
Louisiana Purchase Exposition, St. Louis, Mo.

The American Architect
May 14, 1904
No. 1481



The Administration Building [Washington University]: Louisiana Purchase Exposition, St. Louis, Mo.

Cope & Stewardson, Architects.

The American Architect
May 14, 1904
No. 1481

The American Architect and Building News

IS PUBLISHED EVERY SATURDAY BY THE

AMERICAN ARCHITECT CO.,

238 TREMONT ST., BOSTON, MASS.

Advance Subscription Rates:

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

[Foreign Postage, $2.00 Extra.]

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

ALSO PUBLISHERS OF

Topical Architecture

(Monthly)

Subscription . . . . . $3 per year

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

Address all business correspondence to the publishers direct.

Advertising Agents:

New York City: —
H. M. Carleton, Temple Court, 5 Beekman St.

Agents at Large: —
F. P. Spokesfield, 238 Tremont St., Boston, Mass.

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

BUILDING INTELLIGENCE.

(Reported for the American Architect and Building News.)

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

ADVANCE RUMORS.

Allentown, Pa. — Congress has authorized $110,000 for the erection of a public building here.

Atlantic City, N. J. — The contract for the construction of the Atlantic City Post-office has been awarded to Messrs. Fassell & Wanger, of New York, at $78,487, their bid being the lowest among a hundred or more proposals. The plans and specifications are being prepared in the supervising architect's office, and construction will begin very soon.

Boston, Mass. — The building at the corner of Beach and Washington Sts., used formerly by the firm of Cobb, Bates & Yerxa, is being razed, and the site is to be improved with a new mercantile building from plans by Arthur H. Vinal, costing $200,000. The new building will be ten stories high of light stone and steel frame. It is also reported that on Washington St., near this site, another new mercantile building will be erected.

Agreement papers have been signed for the sale of a valuable property on Cambridge St., near Bowdoin Sq. The new owners will raze the old structure and supplant it with a modern building, to contain store on the lower floor and offices above.

Agreement papers have been signed for the sale of two valuable parcels in the North End, on Commercial St., near Hanover St. It is the intention of the purchasers to improve with a large warehouse.

Brainerd, Minn. — R. R. Wise is to erect a $100,000 brick block for hotel purposes on the general plan of the Waldorf, at Fargo.

Bristol, Va. — Preparations are now being made for the construction of a handsome new building at 5th and State Sts. for the First National Bank of Bristol. The new building will be one of the most elegant ever erected here, and will cost in the neighborhood of $100,000.

Chicago, Ill. — The property at 10 and 12 Madison St. will soon be improved by a new club-house for men, costing in the neighborhood of $1,000,000, if the plans of the present promoters are carried out. The new club is to be known as the Chicago Racquet Club. The plans for the building contemplate a fourteen-story structure, six stories to be occupied by the club, and three or four stories to be leased by the Athletic Association for apartments for its members.

Richard Boericke is to erect a three-story apartment-house at 1831-41 Melrose St., to cost $60,000.

William H. Barry will build 2 three-story apartment-houses in Wilson Ave., near Pemberton St. They will be 50′ x 75′, and contain 12 apartments. Cost, $50,000.

L. M. Mitchell is at work on plans for a three-story building for Thomas Moses, to be erected at 5208-12 S. Park Ave. It will contain 6 apartments and will cost $50,000.

Plans have been completed by J. C. Llewellyn for a new church which the First Baptist congregation of Hyde Park will build at the corner of Woodlawn Ave. and 56th St. It will be 75′ x 95′, of stone with tile roof, and will cost $80,000.

Cleveland, O. — It is said that this city will soon have all its public buildings grouped about a "Court of Honor." "In a general way, the plan contemplates a court extending from the heart of the city to the lake, with monumental buildings symmetrically balancing each other at either end, and the connecting mall given over to an elaborate system of parkings. To prevent the possibility of any unsightly building being erected along the parts of the mall not now needed for public use the city has acquired control of adjacent lands, and is thus in a position to dictate the style of all structures built thereon. Eventually it is the intention to use part of this land for an art gallery and an auditorium, two buildings which have long been needed here. The cost of the buildings, mall, fountains and other accessories is estimated at about $20,000,000."

College Park, Md. — Owens & Sisco, Continental Trust Building, Baltimore, have been commissioned to draw plans for the administration building at the Maryland Agricultural College, College Park. When complete the building will cost about $50,000.

Columbus, O. — The matter of the establishment of another engine-house and equipment for South Side is under consideration.

Come Depot, Miss. — The business men of this place wish to secure the establishment of a cotton factory in the town. A capital stock of $100,000 is contemplated.

Cortland, N. Y. — The Cortland Silk Mfg. Co. has secured the Rose property, at the Homer Ave. crossing of the Lackawanna Railroad, as a site for its factory. Bids for construction have been received by the company.

Danbury, Conn. — J. H. Wittemore, of Naugatuck is making arrangements for the erection of a four-story brick block on the site of the building now occupied by the Danbury Hat Co. on Bank St. If the present plans mature work will be started this summer.

Detroit, Mich. — A permit has been issued Joy & Barcroft for the erection of a two-story brick dwelling on Brush St., between Brady St. and Alexandrine Ave. Cost, $5,500.

D. H. Steinback will erect a three-story brick apartment-house on Brush St., near Alexandrine Ave., costing $16,000.

A three-story frame veneer dwelling is to be erected by William Hart on the corner of Butternut and Trumbull Aves. Cost, $7,000.

Frank L. H. St. Armour will build a $6,000 frame dwelling on Hibbard Ave., between St. Paul and Beals Aves.

The citizens committee have donated a site of 80 acres on Woodward Ave., south of Moss Ave., to the Michigan State Agricultural Society upon which the necessary buildings will be erected as a permanent home for the Society and its annual State Fair.

The Adder Machine Co., Nelson A. Miller, New York, president, will move here and build a large plant.

Pollmar & Ropes, architects, have completed plans for a new building for the Horton-Cato Manufacturing Co. to be erected on Lafayette Ave. at the Railway crossing.

Donaldson & Meier are preparing the plans for the improvement to the city-hall. Cost, $150,000.

A. C. Varney & Co. are the architects for an apartment-building to be built on Palmer Ave., between John R. and Brush Sts. for Mrs. G. L. Sampson. Cost, $30,000.

The Cadillac Automobile Co. recently destroyed by fire, will be rebuilt. Their new buildings will be fireproof — steel, brick, concrete. Rogers & Macfarlane, architects.

Mason & Painter have prepared plans for improving the residence 1123 Woodward Ave. Mrs. C. L. Stephens, owner. Cost, $20,000.

Dorchester, Mass. — A lot of vacant land on Huntoon St., between Butler and Medway Sts., has been purchased by Edna F. McGrath, who will improve with a house for occupancy.

Easton, Pa. — Congress has authorized $60,000 for the erection of a public building here.

Fall River, Mass. — Superintendent of Buildings Ryley, Fall River, Mass., has advertised for plans for a brick school-house on Eastern Ave. A building of 12 rooms is required.

Farmington, Me. — The Centre School District is to have a new school-building to cost in the neighborhood of $25,000, the plans for which, drawn by Architect Chas. O. Whitmore, have been accepted. The new building will stand directly in front of the present one at the head of School St. and will be

BUILDING INTELLIGENCE.

(*Advance Rumors Continued.*)

Easton, Pa. — Congress has authorized $60,000 for the erection of a public building here.

Fall River, Mass. — Superintendent of Buildings Ryley, Fall River, Mass., has advertised for plans for a brick school-house on Eastern Ave. A building of 12 rooms is required.

Farmington, Me. — The Centre School District is to have a new school-building to cost in the neighborhood of $25,000, the plans for which, drawn by Architect Chas. O. Whitmore, have been accepted. The new building will stand directly in front of the present one at the head of School St. and will be

BUILDING INTELLIGENCE.

(Advance Rumors Continued.)

built of brick, two stories high, 32′ x 91′, with slate roof and brownstone and wood trimmings. The citizens gave $10,000 toward its erection.

Fayetteville, N. C. — The Highsmith Hospital Co. has been chartered with a capital of $100,000, for the purpose of establishing a hospital for the treatment of diseases, a training school for nurses and medical students, and a drug store.

Frankfort, Ky. — The new Capitol Committee on May 30 will select the architect who will design the new State-house. He will also attend to the construction of the building under the supervision of the committee.

Galesburg, Ill.—Plans have been asked for a school to take the place of the high school recently destroyed by fire. Probable cost, $100,000.

Hammond, Ind. — Tyble Brothers are to erect here a factory, 2 stores and 30 cottages after designs by Francis Barton, of Chicago. Cost, $60,000.

Hartford, Conn.—Maj. George J. Metzger has been appointed architect to draw the plans for the new State Armory and Arsenal to be erected in this city.

Ground will be broken in a few days for the erection of the new First Methodist Episcopal Church at the corner of Farmington Ave. and Smith St.

Indianapolis, Ind. — At a special meeting of the Indianapolis School Board, the contract for the construction of the new addition to the Shortridge High School was awarded to the John A. Schumacher Co., at a cost of $123,720. The contract provides for the completion of the structure by January 1, 1905. The building is to be of brick and steel construction with Bedford stone trimmings and will be located at Pennsylvania and North Sts., on the site of the old Ricketts homestead.

Jersey City, N. J. — It is reported that a site is soon to be purchased for the new Central fire-station. The matter of securing a new fire-house for the West Bergen section is now being discussed by the fire commissioners.

Johnstown, Pa. — Congress has authorized $85,000 for the erection of a public building here.

Kewanee, Ill. — Beadle & McCullough have submitted plans to the Board of Education for a $75,000 high school.

Lebanon, Pa. — Congress has authorized $75,000 for the erection of a public building here.

Lewiston, Mont. — The city council is considering the establishment of a fire-station at some convenient place across the creek.

Lexington, Ky. — Clark & Howard have the contract for the new Y. M. C. A. building in this city at the corner of Mill and Church Sts. They expect to have the building, which is to be five stories including basement, ready for occupation by October 1.

Lincoln, Neb. — The Board of Regents of the State University has decided to make improvements to the chemistry building at a cost of $20,000.

Little Falls, N. Y. — Architect Lynn Kinne, of Herkimer, has submitted plans for remodelling the Conyne Building, just vacated by B. C. Brown, furniture dealer, so as to adapt it for city department purposes.

Malden, Mass. — Plans are being received by the School Board for the enlargement of the new high-school building to provide three new rooms.

BUILDING INTELLIGENCE.

(Advance Rumors Continued.)

Manchester, Conn. — The plans of J. Morris, of New York City, have been accepted by Cheney Brothers. They call for an addition to the present office-building and alterations so as to have a two-story building and offices on both floors. The building will be of brick.

McKeesport, Pa. — Congress has authorized $110,000 for the erection of a public building here.

Meadville, Pa. — Congress has authorized $65,000 for the erection of a public building here.

Meriden, Conn. — Architect Bloomfield has completed plans for the proposed new building of the Y. W. C. A. It is estimated that the building will cost from $20,000 to $25,000. It will probably be erected on the association's property on S. Crown St. The plan calls for a handsome brick structure in the Colonial style of architecture, with stone trimmings. It will be 55′ x 70′. A number of people have signed their willingness to contribute toward the cost of the proposed building and it is expected that the money needed will be raised soon.

Meridian, Miss.—The East Mississippi Female College, burned about a year ago, will be rebuilt at a cost of $25,000.

Militown, Pa. — It is stated that the heirs of Christian Dutt will build a new woolen mill, 65′ x 125′, three stories, of stone.

Nashua, N. H. — A press report states that Carter, Rice & Co., Boston, propose to purchase the Nashua Card and Glazed Paper Co.'s plant, and run it under the name of the Nashua Card Gummed and Coated Paper Co. One story will be added and other alterations made.

Naugatuck, Conn. — Architects have completed plans for a frame apartment block to be erected on N. Main St. for Sarah J. Hayes. The present house on the site is to be moved to the front of the lot and a building 41′ x 78′, three stories high, built around it. The new building will contain seven apartments of five and six rooms each.

The Holmes, Booth & Haydens Co have taken out a permit to demolish two brick factory buildings on Washington Ave. Sketches have been drawn for new buildings which will be erected at some future time, although no definite details have been decided upon yet.

Oil City, Pa. — Congress has authorized $85,000 for the erection of a public building here.

Peabody, Mass.—The work of rebuilding the Brown glue factory destroyed by fire last winter, will begin immediately. The premises have been leased by the new corporation, the Essex Glue and Gelatine Co.

Roxbury, Mass. — The Guyer Hat Co. is to erect a four-story brick addition to factory at 163 Hampden St. R. A. Watson, architect.

San Francisco, Cal. — Three-story flats are to be built by C. S. Harney on the south side of Fulton St. at a cost of $16,000, and by Fabian Joost on the north side of Fulton St., near Polk, at an expenditure of $30,000.

The trustees of the Young Men's Christian Association are considering the advisability of adding two stories to their building on the corner of Mason and Ellis Sts.

The estate of Capt. I. W. Lees will expend $20,000 on a three-story and basement lodging-house on Pine St, between Taylor and Jones, for which it has plans prepared by Havens & Toepke.

An eight-story and basement brick building is to be erected by O. D. Baldwin, the capitalist, on the southeast corner of Post and William Sts., at a cost of $100,000. The designs are by T. Paterson Ross. About the same sum is to be expended by Thomas Morton in the erection of an eight-story and basement apartment-house on the southeast corner of Geary and Leavenworth Sts., and by Jorge de Urioste on a ten-story hotel on the northwest corner of Van Ness and Golden Gate Aves.

Plans have been drawn by Charles Rousseau & Son for 9 flats to be built by Robert Downing on the southwest corner of O'Farrell and Laguna Sts., to cost $25,000; a three-story brick and frame residence for George F. Cavallia on the southeast corner of Polk and Union Sts., to cost $12,000, and 3 flats on 14th St., near Valencia, to cost $10,000.

Scranton, Pa. — Albert Hartman, Commonwealth Building, is preparing plans for an apartment-house to be erected at a probable cost of $300,000.

Sheridan, Wyo. — The county commissioners have advertised for bids for the new $45,000 court-house that is to be erected here, and work is to be started early in May.

South Hadley Falls, Mass. — The Hadley Mills Co. has purchased land adjoining its present location. New additions will be built later on. There are rumors that a number of houses will be erected on High St. later in the spring for employés, and that some houses already standing will be altered and enlarged.

Washington, D. C.—Thomas H. Pickford and C. B. Hight have begun an immense building operation on Pennsylvania Ave. southeast, 13th and 14th Sts., and Georgia Ave. They will build 40 two-story houses and 4 two-apartment houses, involving an outlay of nearly $100,000, exclusive of the cost of the ground.

Blundon, O'Brien & Belt have purchased from Joseph Paul a tract of land at the corner of N. Capitol and S Sts. and will build on it a block of large two-apartment-houses and 2 eight-room single houses. The apartment block will cost $60,000, the dwelling-houses $11,000.

Washington, Pa. — Congress has authorized $80,000 for the erection of a public building here.

West Chester, Pa. — Congress has authorized $60,000 for the erection of a public building here.

Winchester, Mass. — Blank Bros. are contemplating an addition to their leather factory next fall.

Worcester, Mass. — Johnson & Bassett, manufacturers of woolen machinery, have purchased from the Sargent heirs a lot of land containing about 80,000 feet on Canterbury and Hammond Sts. It is said that they will build a factory there if the grade crossing question is settled in such a manner as to make the site available for the purpose.

COMPETITIONS.

CLUB-HOUSE. [At New York, N. Y.]

The American Societies of Mechanical, Electrical and Mining Engineers, and the Engineers Club of New York City, are proposing to erect adjacent buildings on 39th and 40th Sts. in New York City, for which the necessary means have been provided by the gift of Mr. Andrew Carnegie. Six firms of architects have been specially invited to prepare designs in competition for these buildings, and permission to do so will, at the discretion of the Building Committee, be granted to other architects who may apply for it. The buildings are to cost about $1,000,000, and the drawings on the scale of 16 feet to the inch are to be handed in by the 15th of June. Architects desiring to enter this competition will please address the undersigned, inclosing information as to their training and experience. Only those who have had for two years an established professional position will be acceptable as competitors. Respectfully, F. R. HUTTON, Secretary Engineering Building Committee No. 12 W. 31st St., New York City.

COMPETITIONS.

MONUMENT. [At Toronto, Can.]

The Plans and Designs Committee of the South Africa Memorial Association invite competitive designs for a shaft with sculpture, to be erected in the city of Toronto. Particulars are to be obtained on application to SYDNEY H. JONES, Secretary, 28 Wellington St. West, Toronto. 1481

PROPOSALS.

CHURCH. [At Atlanta, Ga.]

Bids will be received **May 25** by the Building Committee for erecting the First Baptist Church here. G. L. Norrman, architect, 845 Equitable Building. J. J. MADDOX, Chairman. 1481

IRON FENCE. [At New Bedford, Mass.]

Office Constructing Quartermaster, 209 Thames St., Newport, R. I., May 2, 1904. Sealed proposals, in triplicate, will be received here **until 12 M., June 1, 1904**, for constructing iron fence at Fort Rodman, New Bedford, Mass. Envelopes containing proposals to be endorsed "Proposals for Fence, Fort Rodman." CAPT. H. C. HODGES, Jr., Q. M. 1482

SEA-WALL. [At Governor's Island, N. Y.]

U. S. Engineer Office, Army Building, New York. Sealed proposals for building stone sea-wall at Governor's Island, N. Y. Harbor, will be received at this office **until June 1, 1904**. Information on application. W. L. MARSHALL, Major Engrs. 1482

BUILDING AND PLUMBING MATERIALS. [At West Point, N. Y.]

Sealed proposals will be received here **until June 2, 1904**, for building materials, plumbing materials, gas and steam fittings, hardware, tools, paints, glass and other miscellaneous stores specified in schedule to be had upon application here. QUARTERMASTER, West Point, N. Y. 1482

CONSTRUCTION. [At Charleston, S. C.]

Bids will be received **June 11** by Mordecai T. Endicott, Ch. Bureau Yards and Docks, Navy Dept., Washington, D. C., for constructing a two-story brick and steel fireproof building at navy yard here. 1482

PROPOSALS.

HARDWARE, LEATHER, STEEL, ETC. [At Rock Island Arsenal, Rock Island, Ill.]

Sealed proposals upon the blank forms furnished by this office will be received by the undersigned, **until June 6, 1904**, for furnishing hardware, leather, steel, iron, cleaning materials, oils, paints, chemicals, materials for heating and lighting, paper, lumber, etc., during the fiscal year ending June 30, 1905. Information furnished on application. LIEUT. COL. S. E. BLUNT, Comdg. 1482

COURTHOUSE. [At Columbia, Tenn.]

It is reported that the Courthouse Committee has approved plans submitted by J. E. R. Carpenter, 571 Fifth Ave., N. Y. City, for the new courthouse, and bids for erecting same will be received **about June 10.** 1482

HOSPITAL. [At Annapolis, Md.]

Bids will be received **May 25** at the Navy Dept., Washington, D. C., for building a hospital at the U. S. Naval Academy here. CHAS. H. DARLING, Asst. Secy. 1482

COURTHOUSE. [At Pontiac, Mich.]

Bids are wanted **June 14** for erecting a courthouse, for which $100,000 bonds have been sold. GEO. A. BROWN, Co. Clk. Jos. E. Mills, archt., Detroit. 1482

HEATING AND VENTILATING. [At Columbia, S. C.]

Sealed proposals will be received by the Commission for the completion of the State Capitol at Columbia, S. C., **until Wednesday, June 1, at 12 o'clock, noon**, for heating and ventilating the State Capitol. Plans and specifications will be on file after May 1 at the office of Chas. C. Wilson, architect, 1302 Main St., Columbia, S. C. J. Q. MARSHALL, Chairman. A. D. McFADDIN, Secretary. 1482

OFFICE BUILDING. [At St. John, N. B.]

Bids will be received **until May 20** by Jas. G. Taylor, Mgr. Canadian Bank of Commerce, for erecting a new office building here. 1481

Treasury Department, Office of the Supervising Architect, Washington, D. C., **May 4, 1904**. Sealed proposals will be received at this office until 3 o'clock P. M. on the 14th day of June, 1904, and then opened, for the construction (including heating apparatus, electric wiring and conduits) of the U. S. Post-office at Baraboo, Wis., in accordance with the drawings and specification, copies of which may be had at this office or the office of the Postmaster at Baraboo, Wis., at the discretion of the Supervising Architect. JAMES KNOX TAYLOR, Supervising Architect. 1482

Treasury Department, Office of the Supervising Architect, Washington, D. C., **May 9, 1904**. Sealed proposals will be received at this office until 3 o'clock P. M. on the 20th day of June, 1904, and then opened, for the construction of the U. S. Post-office at Natchitoches, La., in accordance with drawings and specifications, copies of which may be had at this office or at the office of the Postmaster at Natchitoches, La., at the discretion of the Supervising Architect. JAMES KNOX TAYLOR, Supervising Architect. 1482

PROPOSALS.

Treasury Department, Office of the Supervising Architect, Washington, D. C., **May 5, 1904**. Sealed proposals will be received at this office until 3 o'clock P. M. on the 15th day of June, 1904, and then opened, for the construction (including heating apparatus, electric wiring and conduits) of the U. S. Post-office and Custom-house at Traverse City, Mich., in accordance with the drawings and specification, copies of which may be had at this office, or at the office of the Postmaster at Traverse City, Mich., at the discretion of the Supervising Architect. JAMES KNOX TAYLOR, Supervising Architect. 1482

Treasury Department, Office of the Supervising Architect, Washington, D. C., **April 30, 1904**. Sealed proposals will be received at this office until 3 o'clock P. M. on the 31st day of May, 1904, and then opened, for new magnetic controlling device and new safety devices, etc., for the electric passenger elevator in the U. S. Court-house and Post-office, Scranton, Pa., in accordance with the specification, copies of which may be obtained at this office at the discretion of the Supervising Architect. JAMES KNOX TAYLOR, Supervising Architect. 1481

Treasury Department, Office of the Supervising Architect, Washington, D. C., **April 28, 1904**. Sealed proposals will be received at this office until 3 o'clock P. M. on the 8th day of June, 1904, and then opened, for the tanks, pumps, piping, etc., for a crude petroleum burning plant for the boilers in the U. S. Post-office, Court-house, etc., at San Francisco, Cal., in accordance with drawings and specification, copies of which may be had at this office or at the office of the Superintendent at San Francisco, Cal., at the discretion of the Supervising Architect. JAMES KNOX TAYLOR, Supervising Architect. 1481

Treasury Department, Office of the Supervising Architect, Washington, D. C., **April 28, 1904**. Sealed proposals will be received at this office until 3 o'clock P. M. on the 9th day of June, 1904, and then opened, for the construction (including plumbing, heating apparatus, electric wiring and conduits) of the U. S. Post-office at Gloversville, N. Y., in accordance with the drawings and specification, copies of which may be had at this office, or the office of the Postmaster at Gloversville, N. Y., at the discretion of the Supervising Architect. JAMES KNOX TAYLOR, Supervising Architect. 1482

BUILDING. [At Fort Warren, Mass.]

Office Constructing Quartermaster, 170 Summer St., Boston, Mass. Sealed proposals will be received **until May 24, 1904**, for furnishing all material and labor for construction, plumbing, steam heating and electric wiring of following brick buildings at Fort Warren, Mass.: One double set of captains' quarters, one double set of lieutenants' quarters, and one double set of N. C. staff officers' quarters. All information and necessary blank forms will be furnished intending bidders upon application to MAJ. JOHN E. BAXTER, Q. M., U. S. Army, Room 410. 1481

SEWER. [At Prescott, Ariz.]

Office Constructing Quartermaster, Whipple Barracks, Prescott, Ariz. Sealed proposals will be received at this office **until May 20, 1904**, for furnishing labor and material for the construction of a sewer. Plans, specifications and other information in this office and in the offices of the Chief Q. Ms., San Francisco, Cal., and Denver, Col. CHAS. C. WALCUTT, Jr., Constructing Quartermaster. 1481

PROPOSALS.

BUILDING. [At Portsmouth, N. H.]
Sealed proposals will be received at the Bureau of Yards and Docks, Navy Department, Washington, **until May 21, 1904**, for constructing a two-story steel frame building, 90′ x 250′ in plan, at the navy yard, Portsmouth, N. H. Plans and specifications can be seen at the bureau or will be furnished by the commandant of the navy yard named upon deposit of $10 as security for their return. MORDECAI T. ENDICOTT, Chief of Bureau. 1481

COURTHOUSE. [At Fargo, N. D.]
Bids will be received by Co. Aud. Arthur G. Lewis **until July 20** for erecting a courthouse, to cost about $80,000. C. E. Bell, architect, Helena, Mont. 1481

MACHINE TOOLS. [At Portsmouth, N. H., Boston, Mass., New York, N. Y., League Island, Pa., and Pensacola, Fla.]
Proposals will be received at the Bureau of Supplies and Accounts, Navy Department, Washington, D. C., **until May 24, 1904**, to furnish at the navy yards, Portsmouth, N. H., Boston, Mass., New York, N. Y., League Island, Pa., and Pensacola, Fla., as specified, a quantity of machine tools, etc., comprising lathes, pumps, planers, saw benches, saws, hydraulic press, gap punch, boring machine, etc. Blank proposals will be furnished upon application to the navy pay offices, Portsmouth, N. H., Boston, Mass., New York, N. Y., Philadelphia, Pa., and Pensacola, Fla. H. T. B. HARRIS, Paymaster General U. S. N. 1481

CHURCH. [At Madison, S. D.]
The Building Committee of St. Thomas Catholic Church, of Madison, S. D., will receive sealed bids for the construction of a church building at Madison, S. D., according to the plans and specifications on file at the Builders' Exchange, St. Paul, Minn.; the office of Anton Dohmen, architect, State and 3d Sts., Milwaukee, Wis.; the book store of L. McCarty, Sioux City, Ia., and the residence of Rev. T. A. Flynn, Madison, S. D. Bids will be opened at Madison, S. D., **June 1, 1904**. Bids sent by mail should be addressed to Rev. T. A. Flynn, Madison, S. D. Rev. T. A. Flynn, pastor. JOHN F. DALY, Secretary. 1481

[*See Alphabetical Index on Cover* 2 *for Pagination.*]

CLASSIFIED ADVERTISEMENTS.

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