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A DECISION of great importance to all persons concerned with public work was delivered the other day by the United States Circuit Court for the Northern District of New York. Some years ago bids were invited by the City of Rochester, N. Y., for the construction of a water-works conduit. The engineer who made up the estimate for one of the bidders made two mistakes, figuring ordinary earth excavation at fifty cents a yard, where he meant to say seventy cents, and excavations in tunnels at a dollar and a half a yard, instead of fifteen dollars. The engineer was present when the bids were opened by the representatives of the city, and, as soon as he heard his bid read, at fifty cents a yard for excavation, he declared that this was an error. Nevertheless, the city officials refused to allow the engineer's principals, the Moffett, Hodgkins & Clarke Company, to withdraw their bid. The total amount of the bid, as made up on the erroneous figures, was about sixty-four thousand dollars less than it was intended to be, and the Moffett Company brought a suit in equity for relief. After dragging along for nearly four years, the case has just been decided in favor of the Moffett Company, and the decision lays down the principles of the law in such matters in a very interesting way. The counsel for the city did not try to prove that no such mistakes were made as the engineer alleged, and conceded that if the transaction were one between individuals the bidder could undoubtedly withdraw his bid at any time before its acceptance, but they claimed that the case was different with public bodies, and cited the city's charter, which says that "Neither the principal nor sureties on any bid or bond shall have the right to withdraw or cancel the same until the Board shall have let the contract for which such bid is made, and the same shall have been duly executed." The Court, however, ruled that this clause in the charter was not applicable to the facts in the case, as the complainant was not endeavoring to withdraw a bid, the document submitted not being its real bid, but a different proposition, for which it was no more responsible than it would be for something containing a printer's or copyist's mistake. The counsel for the city claimed, also, that a court of equity could not alter a contract, but the Court ruled that the complainant did not seek to alter any contract, but applied for the cancellation of a bid which it had not really made; and a decree was ordered, rescinding the complainant's proposal.

MR. EDWARD ATKINSON has written for the *Spec-tator* an interesting account of the development of automatic fire prevention, meaning by this, of course, mainly the sprinkler systems, which are practically the only automatic

appliances for preventing the spread of fire. The use of sprinklers is now so general that it is difficult to realize that they were first used in 1875, when nearly twenty-five hundred Parmelee sprinklers were put into three mills in Fall River. At that time, it was quite common to protect mills with perforated water-pipes, carried over the ceilings, and controlled by valves placed in some convenient situation for immediate use, and, under the care of the late James B. Francis, such pipes had been introduced into most of the factories in Lowell. About 1880 a fire broke out in a mill in Maine, which had been fitted with the Parmelee, then called the Grinnell, sprinklers, and was extinguished with a loss of five or six hundred dollars. Soon after a very similar fire occurred in a Lowell mill, of nearly the same type, and used for the manufacture of the same goods as the Maine mill, and was extinguished with the help of the perforated pipes, but it was necessary to turn the water into the pipes in two rooms, and damage to the amount of more than eighteen thousand dollars was done, mainly by water. This opened the eyes of factory managers to the comparative merits of the two systems, and the persistent efforts of Mr. Atkinson himself contributed greatly to secure their adoption in mills belonging to the mutual insurance company which he directed. Now, it is hardly necessary to say, millions of automatic sprinklers, of more than a hundred different patterns, are used, not only in factories but in large retail stores, which, it may be observed, need them, in the interest of the public safety, more than factories do. The effect of their general introduction has been an immense saving in the aggregate fire-loss in manufacturing. Mr. Atkinson says that the losses in his company, which carries more than one hundred million dollars of risks, were, in 1897, less than one cent on each one hundred dollars insured, — that is, less than one one-hundredth of one per cent. Supposing this average to be maintained, the premium rate of one-tenth of one per cent for five years, charged for the Clearing-house building in New York, would pay a profit of one hundred per cent on cotton-mill risks; yet we are told by insurance people that the Clearing-house insurance was a "war measure," due to the demoralization of the New York insurance business, and the disposition of the companies to write policies at a loss, in order to keep customers.

IT may be remembered by our older readers that, twenty or twenty-five years ago, when mutual insurance was not much known among manufacturers, the rates of premium on cotton-mills was two per cent a year, or more than two hundred times the rate of loss shown for 1897 on the books of the Boston Manufacturers' Mutual Company; and the insurance companies professed not to be anxious to write policies even at that rate. As there are now many manufacturers' mutual insurance companies, all conducted in substantially the same manner, and, presumably, with about the same result, it is obvious that the industries of the country, particularly those of New England, have, within much less than a generation, been relieved of a burden amounting to several million dollars annually, simply through the application of common-sense to the insurance business by a few men, among whom Mr. Atkinson himself ranks deservedly first; and, as the cost of insurance in manufacturing must be added to the price of the goods, every person in New England who has to buy cotton or woollen goods, hosiery, blankets or similar articles, for himself or his family, has reason to be grateful to Mr. Atkinson for securing to him a very material saving in their cost. The progress of this great reform has been so quiet that few persons realize what it has accomplished, or how the work has been done. In brief, Mr. Atkinson and his associates have looked upon the insurance business as one in which close observation of facts, and the assiduous application of means for reducing the losses against which indemnity had been guaranteed, were more desirable than hilarious flattery of possible customers, the employment of reckless agents, or dishonest evasion of the consequences of contracts, and they have not only conferred incalculable benefit upon manufactures and consumers of textile goods, but have created a new system of fire-resisting construction, and have now brought, by their example, the other insurance companies, grudgingly enough, it is true, to intermit occasionally their squabbles, for the purpose of adjusting rates in some distant proportion to the actual risk.

AMONG the curiosities of insurance is a story that Mr. Atkinson relates about sprinklers. His theory is that automatic sprinklers should be put in every part of a factory, whether there is any apparent necessity for them or not. A certain mill was fitted with sprinklers throughout the interior, but the manager omitted to put one on the outside of the building, over the "tail-race," or open conduit through which waste-water flowed out of the mill into the river. It seems as if the manager might be excused for thinking that a water-conduit on the outside of a building hardly needed to be protected against fire by putting an automatic sprinkler over it; yet this hasty reasoning on his part resulted in a considerable loss to the insurance company which held the risk on the mill; for, after the mill had been equipped, an accident occurred on a railway bridge near by, and a tank of oil was broken open. The oil took fire, and fell, burning, into the river, and the flames crept through this particular tail-race into the mill, and set it on fire, doing serious damage. The damage would have been very much more serious if it had not been for the sprinklers inside the building, which prevented the spread of the flames; but Mr. Atkinson thinks that if there had been a sprinkler over the tail-race they would never have reached the inside of the mill at all.

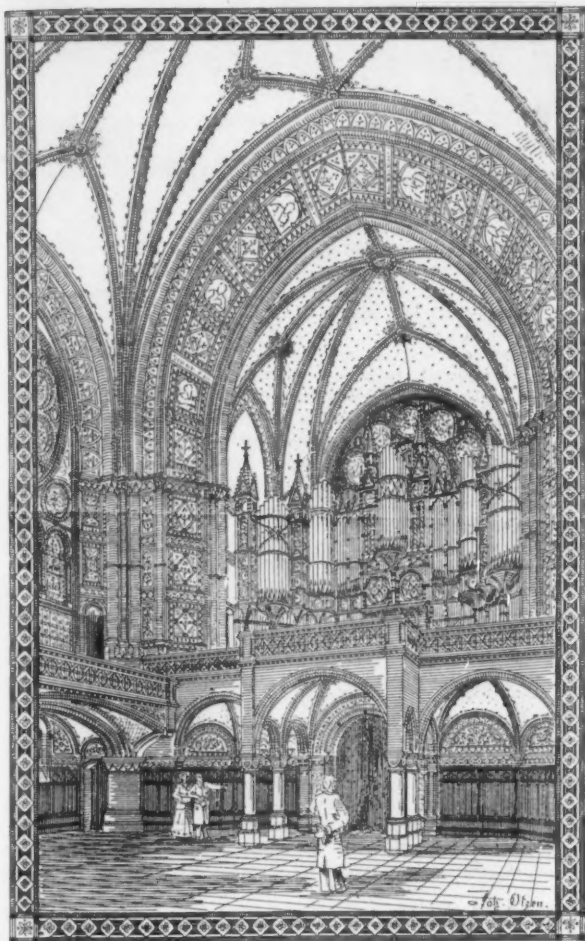
MR. A. N. PATERSON, whom some of our readers have probably the pleasure of knowing, recently read a paper before the Royal Institute of British Architects on "Domestic Architecture in the Eastern States of America," which was remarkable for its intelligent comprehension of a subject which is generally absurdly misunderstood by foreign architects. Instead of entertaining his hearers, like a certain French professional tourist, with descriptions of the "magnificent retail establishments for the sale of liquors, known as 'drug-stores,'" and similar circumstances of American life, Mr. Paterson confined himself to a comparison of English and American house-planning, with some excellent observations on the reasons for the differences between them; and, in the succeeding discussion, in which Professor Kerr took a leading part, he made some further sensible remarks. The most noticeable difference that he found between English and American middle-class houses took the form of freer connection between the rooms, it being common in America to separate rooms by double sliding-doors, where, in England, only single doors would be used. When the sliding-doors were open, a spacious air was thus given to an American house, which was lacking in an English house of the same size, and which seemed to the speaker a pleasant feature. His suggestion that English architects might learn something from their American cousins in this and other matters of house-planning seemed, however, to excite the resentment of Professor Kerr, who summoned from its grave the ghost of the ancient notion that Americans are fond of hotel life to account for their liking for sliding-doors between their rooms. "The American," he said, "liked to live in his own house as in an hotel. That was the Latin way of living," and the Americans, while accepting the Gothic idea of an enclosed plan, "got the Latin principle introduced." As for a plan of a small American house which Mr. Paterson had described, with approval, he regarded it as "an exceedingly badly-planned house, and one which was uncomfortable to English notions." Even sliding-doors, opening between rooms so as to form "processional suites," would not do in England. "How would the people of this country," he asked, "like to push aside and march through such doors? It would not do at all." He accounted for some of the peculiarities of the houses in the States by the theory that the architects "did not know any better." "The Americans," he said, "did not seem to manage things properly. They made the whole of the house a string of doors, and these they kept open. That was contrary to English notions of comfort and convenience."

MR. PATERSON ventured to suggest that one reason for putting wide doors in American houses, and keeping them open, was that these houses were usually warmed throughout by hot-air or steam, and, as all the rooms were warm, no unpleasant draughts resulted, in winter, from leaving the doors between them open; while in England, where hot-air furnaces are unknown, and, in a middle-class house, the only warmth, for the living-rooms, is derived from fire-places in one or two of them, open doors mean intolerable draughts. He might have added, with truth, that our wide doors serve to give a grateful current of air through the house in hot weather, and that a

house with doors on the English system would be almost uninhabitable in our summers. In regard to fireplaces, Mr. Paterson made an assertion which is new to us; that they are as common in American as in English houses, but, in the former, they serve for cheerfulness and ventilation, the house being otherwise sufficiently heated, while, in the English houses, they are depended upon for warmth. Another feature of American houses which Mr. Paterson found commendable, and Professor Kerr very much the reverse, was the provision of closets for the bedrooms. We are so accustomed to these indispensable conveniences, as we think them, that it generally surprises an American to find that in English houses bedrooms rarely have a closet; but Professor Kerr was sure that such a thing "would not do" in England. "It would get stuffy, and the dust that would come out of it from one's clothes, the port-manteau and such things, would be most unpleasant." An American housekeeper would say that a simple way of preventing dust from issuing from the clothes and other things in a bedroom closet would be to brush off the dust before they were put into the closet, and if they are put into the closet clean they are very unlikely to accumulate dust there. Mr. Paterson seems to have been somewhat cowed by this criticism of American closets, for he remarked, apologetically, that a bedroom closet was really quite convenient, especially when it had a window in it; the fact being, as every American knows, that a window, though necessary in a pantry, is objectionable in a bedroom closet, for the reason that dust gets in around the sash, however tightly it may be fitted; and the light is detrimental to the freshness of materials of delicate color; while, if the sun should shine into the window, the air in the closet may become very hot, to the injury of certain articles, such as those made of leather.

THE steady, quiet and economical Dutch are well suited by nature to coöperative experiments, and it is interesting to learn that a colony of this sort has been flourishing for fifty-one years in Iowa. In 1846, a little band of Hollanders, under the name of the Amana Society, bought three thousand acres of prairie land, and began to cultivate it in common. They prospered, and invested their savings in additions to their farm, until they have now a tract of fifty-seven thousand acres, on which is a small town, besides seven little villages of brick and stone houses. Apparently, the community does not seek to revolutionize religion, or any department of ethics, but desires simply to cultivate the "buiten zorg," or freedom from care, so dear to the Dutch heart. In pursuance of this aim, every member of the community turns over all his property to the common fund. He receives a receipt for it, and, if he chooses at any time to leave the Society, it is restored to him in full; but while he remains in the community he is relieved from the main source of worldly anxiety. Family life seems to be maintained just as it would be in any Dutch village, and, as every man is allowed thirty dollars a year for clothes, and every woman twenty dollars, envy and display do not have much chance to breed dissension. Schools are carried on, in which, until recently, only Dutch was taught; but some of the young people now learn English.

WE mentioned the other day that M. François Dejean had left by will twelve thousand francs, to be distributed among this year's competitors for the Prize of Rome in Architecture. *La Construction Moderne* now gives a full account of the will, which contains other generous provisions in favor of the profession. M. Dejean, who belonged to a rich family, was never married, and had no immediate relatives to claim his property. He left, however, twenty thousand francs to a grand-niece, and twenty thousand more, with all his books and works of art, to a grand-nephew, M. Périn, now a pupil in the Department of Architecture in the Paris School of Fine-Arts. In addition to these private bequests, and a few others, he left to the School of Fine-Arts twelve thousand francs, to be divided among the "logistes" of the Grand Prize, as already described, and to the eleventh *arrondissement* of the City of Paris a sum sufficient for the erection of three drinking-fountains, one of which should be placed near the house in which he lived; together with a certain sum for the "colonie scolaire" of the *arrondissement*. All the residue of his property was bequeathed to the *Société Centrale des Architectes Français*, to be used for the erection of a building for its accommodation. How much the sum so bequeathed will amount to seems to be not yet known, but it may be hoped that it will be sufficient to provide a worthy habitation for the society.

THE CONSERVATION OF HISTORICAL MONUMENTS
IN ITALY.¹—II.Organ-loft of the New Church of St. George, Berlin, Prussia. Prof. J. Otzen, Architect. From *Deutsche Bauzeitung*.

NOW comes the most curious and surprising point of our argument, that which reveals that even good things have their dark side. In Italy, the desire for the preservation of artistic monuments has become a real fetishism, in contrast with the free movement of modern art, and the rational development of the traffic in objects of art. The peninsula which "the sea and the Alps encircle" is politically united, but in matters of legislation it is not so, at least so far as concerns legislation in regard to the fine-arts; and, in consequence of this, a thing which is permissible in Florence may not be allowed at Rome or Venice or Milan. But the most striking diversity in legal treatment exists between Rome and the provinces formerly subject to the Pope, and the other provinces of the kingdom. In the former provinces there is in force an edict, known as the "Pacca Edict," from the name of its author, who was a cardinal, which represents the most glaring invasion of the rights of private property. According to this edict, or the law which it is the fashion to call by that name, no one at Rome, or in the former Papal provinces, can sell, or dispose of himself in any way of, an object of art, except by paying to the State the exorbitant tax of twenty per cent on the value of the object as estimated by the Government officials. And this is not enough; the Pacca Edict, which dates back to 1720, provides that any object of art which it is desired to export from the pontifical provinces to foreign countries, or from Rome either to the provinces or to foreign countries, shall be submitted to the most rigorous inspection, reserving to the Government alone the right of permitting such exportation. This signifies that if the Government does not choose to permit a private citizen to sell one of his objects of art, he cannot do so. The *American Architect* has several times mentioned the Pacca Edict, and I do not need to insist upon its illiberal character; but I will mention a case which shows the harshness of its application. This is a very recent affair, decided only within the last few months. A certain A had sued the Minister of Public Instruction for the restitution of a duty, of twenty per cent of the value, paid by him for permission to export from Rome a little picture, valued by the Government official at five francs! A, through his counsel, S, claimed that the Pacca Edict, relating to the transportation of objects precious for their antiquity, or their artistic quality, and applied to private individuals, so far as concerned the duty of twenty per cent, had been implicitly abolished by the application of the new laws of the Kingdom of Italy, and, in any case,

could only be applied to objects recognized as of exceptional artistic or historical value. The tribunal rejected A's claim, but the Court of Appeals ordered the Minister of Public Instruction to restore the duty collected, holding that the interpretation given by the Government to the Pacca Edict was unjust, because it was applied to all antique or artistic objects, while the edict in question referred merely to objects valuable historically or artistically. The importance of this very recent and just interpretation of the Pacca Edict will be appreciated. It rejects and condemns the interpretation which has always been given to this law by the Government officials, who never made the slightest distinction between important and unimportant objects of art; and defends the rights of owners against the State, which, in matters of direct taxation, follows annoying methods in preference to more generous ones.

Let us leave Rome, and the old Papal State, merely remarking that the Pacca Edict was accepted, in 1871, by the Italian Parliament, as the rule of artistic legislation for Rome and the former Roman State, and take a look at the manner in which the other principal provinces of Italy are regulated in regard to the conservation of objects of art. We shall not be long in finding out that they are governed in this respect by laws devised when there were no such ideas of private liberty as are now held. In Tuscany there is something which resembles the Pacca Edict. A certain very liberal prince of that country, Pietro Leopoldo, in 1780, "wishing to liberate his subjects from prejudice" (these are the words of the "Leopoldina" law) "in matters of 'Treasures,' excavations and the extraction, outside the boundaries of the State, of antique monuments, and wishing to claim these objects in accordance with natural equity," commanded that absolute liberty should be given to every one to make excavations, to search for objects of art, and, having found them, to keep them as his own; and to transport from one place to another, and also outside of the Grand Duchy, any monument of antiquity whatsoever; and commanded also that any object which might be considered worthy to be acquired by the Government should be purchased at a price "rigorously corresponding with its rarity and beauty." This is, as to its main features, the law of Pietro Leopoldo of Tuscany, which is so frequently cited by writers on the subject which we are now discussing. My observation, however, that there is in Tuscany something resembling the Pacca Edict, applies to the fact that there is in force there another law, profoundly different from the "Leopoldina," which can only be considered as expressing a reaction toward an exaggerated and severe legislation in matters of art. This earlier statute, dating from 1754, is called the Di Richecourt Law, and, according to its terms, any one who sells a work of art, the production of any artist named in a list attached to the decree, is condemned, not only to forfeit the object but to pay, in addition, a fine equal to its value. Naturally, the names which appear at the head of the list are those of Michael Angelo, Raphael, Leonardo, Andrea del Sarto, Titian, Correggio, etc. To enact such a law was to suggest means for evading it, at least so far as painting is concerned. In this case the trick employed was tolerably ingenious; a painting of any kind covered the work to be sold with a new subject in tempera, which could be washed off subsequently with a sponge, leaving the original picture unharmed; while the canvases or panels, with their new subjects, passed as works of living artists, not included in the official list, and, as such, passed out of Tuscany with great facility. The law of 1754 exempted religious corporations from its provisions; and these were not included until 1818, when not only they, but churches and convents, were forbidden to export works belonging to them from the territory of Tuscany.

Passing over half a century, let us come to 1860, and to the time of the Italian Government, which, by a decree in that year, prohibited the exportation of works of art without the authorization of the Government, and applied the penalties of the law of 1754. Since then no change has taken place in the statutes relating to these matters. The law in Tuscany, moreover, is not a thing to be trifled with; the penalties are enforced, as they were, not long ago, against the proprietor of the celebrated bells of the Magnifico, in the palace at Siena which bears that name. Permit me to remind you of the fact that this story relates to ornamental works of world-wide fame.

At the end of 1887 restorations were made upon the decayed front of the palace of the Magnifico.² Upon this palace were the bells, modelled by Marco Cozzarelli, a Siennese artist, who died in 1515. One fine day, a rustic day, as the Siennese say, the scaffoldings were taken down from the façade of the palace, and the bells had disappeared. The Commission for the Conservation of Ancient Monuments, the Academy of Fine-Arts, the Art Club and the Prefecture, all took action, and protests accumulated. By good luck, the bells intended for sale had not yet got out of Siena, and were within reach of seizure. After their seizure, legal proceedings were instituted, first in the Tribunal of Siena, and finally in the Court of Appeals at Florence, and in the end the owner of the bells was obliged to forfeit them, and to pay a heavy fine in addition.

We will now see what laws are in force in Lombardy and Venice, and we shall not have to look back farther than 1804. Of that date exists a decree of the Vice-President of the Republic of Venice, which absolutely prohibits "the exportation of works of deceased artists, valuable for their celebrity, rarity, antiquity or otherwise."

¹ Continuation and conclusion. See *American Architect*, No. 1187, pp. 67-68.² Pandolfo Petrucci.

In 1815, at Milan, the Count of Bellegarde published a similar decree; and in 1817, at Venice, the Royal Delegation confirmed the laws already in force. But after 1817 matters changed; the Venetian Government of that period, probably at the instance of the "Aulic Chancellery of Vienna," (it is necessary to call to mind, here, that at that time Italy was not politically and socially united, as it is to-day), divided on matters relating to the artistic legislation then in force. One party sustained the prohibition of exportation, without the compulsory acquisition by the Government of the objects intended to be exported; while the other party approved the right of preventing exportation, but only on condition that the object in question should be purchased by the Government. This latter idea, though a praiseworthy one, presented difficulties even then; for, in order to carry into effect the prior right of purchase, it was necessary to have at hand the funds required for exercising it, or the law would become a mere rhetorical formula of assertion of the right to dispose officially of private property. As a result of these and similar reflections, a decree was promulgated in the Lombardo-Venetian territory which absolutely prohibited the exportation of "objects of art or literature the absence of which would leave a void in the body of works of that kind existing in the kingdom." In 1827 this decree underwent some modification, the State requiring notice in the case of the proposed exportation of works, and claiming the right of preference in their purchase. With a temporary exception, after 1849, the law has remained to this day substantially unchanged.

Let us now give a glance at the laws of Naples, and then we will draw our conclusions.

In 1755 a law of Naples prohibited private citizens from digging up objects of art without license from the king; and this under penalty of loss of the object found, and three years of banishment for "nobles," or three years in the galleys for "ignobles." Nevertheless, the law was discreet enough to declare that the prohibition applied only to objects really precious and rare. In 1860 the law was modified, but hardly in the direction of liberality.

From all that I have written, it appears, therefore, that Italian legislation in regard to the exportation of objects of art is generally rigorous, and in Rome monstrous; and it may easily be comprehended why the Government should have considered the abolition of the edicts, decrees and ordinances which I have briefly described, and which, besides jarring with the sentiment of political unity now triumphantly established through successive provincial revolutions in Italy, are at open variance with modern ideas, and particularly with those touching private rights in a society such as ours. Accordingly, the Government, through the agency of its Ministers of Public Instruction, who in Italy direct the administration of fine-arts, has endeavored more than once to arrange an artistic legislation which, abrogating all the ancient decrees, should correspond with the new political and social conditions. One of the recent projects for a law of this kind came to miserable shipwreck in debate; and the Minister, in the end, resigned his portfolio. The last of them (if it really be the last, for there is no Minister of Public Instruction in Italy who does not either attempt or promise to regulate the legislation for the conservation of monuments) is that of 1893, which was really a tolerably liberal legislative scheme. The substance of it was this: that if the Government wishes to keep in Italy objects of art belonging to private citizens, it must buy them; and if it has not money for that purpose, it cannot prevent other people from buying them. The Minister wished, moreover (I speak in the past tense because the Minister who introduced this project of 1893 has fallen) that a distinction should be made between the rights and duties of the religious bodies legally recognized and private citizens. From the first he took all right of making sales; but to the second he conceded it under certain restrictions; but he made a rather perilous distinction among the objects belonging to private persons, saying that objects which have the highest historical or artistic interest cannot be sold; and he maintained otherwise the right of the State to intervene in the care of objects of art belonging to private owners, and made by law inalienable — that is, excluded from sale — if such objects should not be properly cared for by their owners. This project established also a uniform tax of ten per cent on the exportation, to foreign countries, of objects of art, excepting those executed within the preceding fifty years.

To this point have arrived matters concerning the conservation of the artistic patrimony of Italy; and for a country artistic *par excellence*, as ours is, it seems to me that we have not reached a very high point. Meanwhile, we are waiting until some new Minister shall present to the consideration of the two Chambers some project of his own, which must be inspired with liberal ideas if it is to arrive in good condition at its goal; for laws absurdly restrictive and grasping, and rendered more offensive by tyrannical application, are no longer suitable to our time, and serve no purpose but to foster smuggling and dishonesty.

ALFREDO MELANI.

FOREIGN ACCENT TAUGHT BY PHONOGRAPH. — According to the *Electrical Engineer*, the phonograph is being used for the purpose of teaching foreign languages. Already a complete course in French has been transferred to cylinders by a member of the Académie Française, and these cylinders will presently be obtainable by students who prefer to perfect themselves both in grammar and pronunciation by the aid of a phonograph.



THE AYERS BUILDING FIRE. — LOWERING THE HEIGHT-LIMIT OF BUILDINGS. — THE CARPENTERS' STRIKE. — REPLACING A RAILROAD BRIDGE. — THE COLD STORAGE WAREHOUSE. — EXHIBITIONS.

THE past month has been one of disastrous fires here in Chicago, one especially, that of the Ayers Building, being most harrowing in the horrible loss of life connected with it, nearly thirty persons going down to a fiery death among its flaming embers, while many others were injured. This structure was a seven-story building, situated on Wabash Avenue, near Adams Street, and, being the headquarters of piano, wall-paper and photographic-supply firms, was filled with most inflammable material. Ten minutes after the alarm of fire was given to the two hundred persons who found their daily occupation there it was too late for any one to make his escape. Naturally such a condition of affairs immediately has set on foot an investigation to prove criminal carelessness on some one's part, as shown by the rapid consuming of a building which was said to be of slow-burning construction. Certainly it needs but little investigation to show that, in the matter of fire-escapes, the State law was violated in every possible particular. The law requires that in buildings over three stories high there shall be an escape for every fifty persons. In this seven-story one, with its two hundred persons, one poor affair, on the alley in the rear, was all the apparatus there was of this description. On the first investigation of the ruins Deputy Commissioner O'Shea made the following report: —

"Some one should be held responsible for the construction of that building. I have brought with me some of the five-inch spikes, which tell the story of the building's collapse, and the faulty construction of the building at once. Each is bent nearly double. This is the reason for their being twisted all alike: Running from the front wall to the rear wall of the building, in every story, were two lines of double yellow-pine girders, five by twelve inches. These were supported by iron columns, the girders resting on one-and-one-quarter-inch flanges cast on the columns. In the flanges were two eyelets on either side of the interior columns, and on the inner sides of the columns which formed parts of the walls. Through these five-inch spikes were driven upward into the wood girder. In some cases I found small spikes had been used, where the heads were so small that they pulled right through the eyelets when the girders fell. There were no anchors to form a continuous tie from the front to the rear wall, and nothing save the spikes I show you here held the line of girders together and to the two end walls.

"When the explosion took place the greatest strain was on the front and rear walls, there being solid masonry walls and buildings on the sides. There was enough iron in each end wall to build a man-o'-war, and when once it started, being top-heavy, it went with a crash. The only thing to hold it was small spikes. The strain tore the front wall and supporting columns away from the girders, at the same time wrenching them away from the first interior columns. The strain at the rear was the same, and the girders, unsupported at both ends, pulled away from the interior columns, wrecking them and the girders supported by them, in turn, and the six floors and roof went down like a house of cards.

"The outside columns, which formed parts of the front and rear walls, and the interior ones as well, all of which supported the floors and roof, were of cast-iron, not of steel, as in the buildings of approved modern construction. Had the columns been of steel, continuous from bottom to top, and the girders properly tied to each other, to the walls and the columns, the explosion would have hurled the windows and walls into the street, but the columns in both walls, the floor-supporting columns and the girders would have held together, and the floors would not have fallen until the girders burned through or were broken. That would have given all the people in the building time enough to escape. As it was, none of the girders were burned more than three-eighths of an inch on either side, but the sharp angle to which the wrought-iron spikes were bent shows that the big timbers went down while they were intact, and strong enough to bend the iron spikes.

"The girders should have had steel anchors bent around the outside columns and bolted through the girders to firmly unite the walls and girders, and then the girders, where they rested on the interior supporting-columns, should have been united by steel tie-plates on either side of the girder, and long enough to cover the girder for a foot or more on either side of the head of the column. These should have been bolted through also. In this way a continuous tie would unite the walls and interior floor-supports in such a manner that a collapse, such as took place, would have been impossible.

"North and south, the building was properly constructed; but, with nothing to hold the ends together and support the floors when the wall went out, it is no wonder the building went up like a flash."

According to the architect, L. G. Hallberg, the building was properly constructed. He says: "Regarding the anchoring or tying together of the ill-fated buildings No. 215 to 221 Wabash Avenue, I

will state that that part of the work was done well. There were strap anchors on each side of girders around columns, from front to rear, and on top of each joist from side-wall to side-wall tying over girders, and heavy anchors in walls spiked to each joist.

"Besides these usual anchorings, there were holes cast in brackets of columns on which the girders rested, and in these holes heavy spikes were driven, in addition to what the specifications called for, in order to anchor the building well.

"Had the anchoring been insufficient that building would have blown down in the gale that swept over the city in March the year it was built, when the south wall and part of the front and rear walls were up to the roof and foundations were being laid for the north wall."

The coronor's jury censured the owner and recommended that the case be referred to the grand jury. One of the adjoining buildings has been declared unsafe and condemned. Whoever may have been at fault in the construction, it is very certain that this building is no different from dozens of others, right on the same street, in regard to its plan, which was that of a veritable fire-trap. The one passenger-elevator, which is nearly always a small affair leading up from the street, delivers its load directly into the offices on the different floors, there being no general hall. A large light-shaft usually runs through the centre, which, in time of fire, is converted into a funnel for roaring flames. The stairs which are in the building are usually at the rear, near the freight-elevator, only approachable through the offices, past the light-shaft or around a corner, accessible through dark and crooked passages, which when filled with smoke from a fire would be converted into perfect mazes. There is certainly more than one building on Wabash Avenue which ought to be condemned as unsafe, unless the means for sudden exit can be improved.

Apparently it is not the highest buildings, properly constructed, which are the most dangerous, but, nevertheless, the question of the sky-scraper is constantly coming up, and recently, at a special meeting of our City Council, the ordinance which formerly limited the height of our buildings to 155 feet, or twelve stories, was amended, reducing the height to a maximum of 130 feet, or ten stories. One very serious criticism of the new ordinance is, that, while it reduces the height of the actually fireproof buildings, it does not reduce the height, at the same time, of the cheaper and non-fireproof class of construction. As a consequence the cheap, ordinary construction and the expensive fireproof construction are so classified that, in reality, a premium seems almost to be put on the cheaper class, since the returns to the owners upon a somewhat lower building of ordinary construction would be larger than the return upon a slightly higher building of fireproof construction.

It is interesting to note that bids for the new post-office were opened April 4th, which makes it look as if things were really moving along. Practically these bids were for all the rough work of enclosing the building. There were fifteen contractors who submitted proposals on this work, the contract being made with the lowest bidder, John Pierce of New York. His bid was \$1,987,000, and the rest ran all the way up to \$3,203,400.

In view of the fact that all building matters were at rather a standstill and the slightest discouragement to plans counts as a good deal, the carpenters seem to have thought it advisable to go off on a general strike. Accordingly five thousand carpenters, complying with instructions from the local unions, gathered up their tools and marched off from work on April 4th. Of course the ostensible cause for the strike is an increase of wages to \$3.75 an hour, and this demand would willingly be acceded to, but the real fight was on the question embodied in "Article X," so called. This rule compels the Union carpenter to work for no other contractors than those belonging to the Master Association. That means that from nearly one-third of the carpenter-work in the city the Union men were debarred. Many bosses have granted the increase of wages, at the same time giving in on this point, and spring work is going on as usual.

An interesting feat in engineering was accomplished last month in the construction of a new bridge across the Chicago River where the tracks of the North Western cross it near its station. Being so near the depot as it is the interruption to traffic was a serious question, as all the different branches of the road pass over this bridge. The plan adopted, proposed by Mr. W. H. Finley, of the engineering department of the road and engineer in charge of the work, was the following: The new bridge construction was built at a point in the river just south of the old bridge, one end resting on a scow, while the other was built upon ways provided for the purpose. When the structure was completed two scows that had been filled with water till they rested nearly at the surface of the river were towed under the old bridge. The water was then pumped out, the scows rising till the bridge was finally lifted from its fastenings. By means of tugs it was then swung around and floated down the river to one side. The new bridge was placed in its new position by the reverse of this process. On scows it was floated over its proper foundations, the valves of the scows were then opened, and as the scows filled the structure settled down into position. The new bridge being much heavier than the old one a new foundation was necessary, and this was built around the old one by means of a coffer-dam. As the new bridge was longer than the other new approaches were built of masonry just beyond the old ones of piles, the old ones in both cases doing service as long as

they were required. All being in readiness, during one Sunday, when traffic is comparatively light, the trains were stopped at the farther side of the river, and by Monday morning, just twenty-four hours after work was begun on the removal of the old bridge, the new one was in place, and trains were running into the station as usual.

Several important structures are about to be erected in our city, and before the war talk came upon the scene something like the first twinkle of the dawn of prosperity had been noticeable in the dim gloom which has existed for the last three years in architects' offices. One of the largest undertakings, directly in the city, is the cold-storage warehouse to be erected by the Western Cold Storage Company. The company have leased of the Illinois Central Railway Pier No. 2 and will immediately begin the erection of this cold-storage house, which will be part of one of the largest systems in the world, it is said. This fine building will be over one hundred by two hundred feet; tracks will run along its southern side, while there will be a team delivery on the north. The building will be of mill-construction, but by the use of a fireproof transverse hall the building will be practically changed into two distinct buildings and the fire-risk much lessened. There will be six vertical sections, each one allotted to a separate class of goods. The boilers and machinery will be placed in a large building distinct by itself, and all the apparatus for controlling the temperature and humidity of the air, as well as purifying it, will be of the latest and most approved fashion. The engineer of the company, Mr. Charles L. Krum, has charge of this part of the work, while whatever architectural effect may be obtained in such a building is in the hands of Mr. Jarvis Hunt. If report be true, more of an effect will be obtained than one would naturally expect in such a building, the material used being a buff tile veneer, relieved by belt-courses and cornice of brown brick. Another new building to be erected in the southern part of the city is the Jewish Orphan Home. As is not usual in such cases, the competition for plans seems to have been conducted with unusual fairness, the judges being, besides one layman, two such well-known architects as Dankmar Adler and S. A. Treat. The plans accepted were those of Simon B. Eisendrath, and, from the description, would indicate most excellent appreciation of the needs of such an institution.

Still farther south, the large Church of the Immaculate Conception is to be built in the spring. The church is to cost about one hundred thousand dollars and will be ambitious in its proportions. That it will aspire to other perfection than that of mere size remains to be seen.

One item of interest this month in architectural circles has been the Eleventh Annual Exhibition of the Chicago Architectural Club, at the Art Institute. To say that the present architectural exhibit exceeded in interest those of preceding years would be a remark very wide of the truth. There seems but little desire evinced generally by practitioners to make exhibits of their sketches and elevations in this place, and with, of course, some exceptions, the exhibition is largely given over to projects and sketches, many of the latter with but faint architectural suggestion about them. Even this sort of an exhibition might have been more interesting if the works of any one school could have been hung together, so that comparisons could have been made without walking all over the galleries. In some instances this has in a measure been done, as in the work coming from the Atelier Masqueray. This work is very distinctive in its methods and could be easily recognized from any of the other school work were it not more or less grouped together. It has a kind of boldness and a certain quality of *chic* about it which is quite unusual, and very distinctive from the work from any of our other American schools. In the work here shown Columbia University of Pennsylvania and the Chicago Art Institute compare with one another very favorably; the work from the University of Illinois has a tendency to weakness rather than strength, and the exhibits from the Massachusetts Institute of Technology were so scattered that, with the exception of one or two good examples, which were in prominent places, one tired and became discouraged before one found them.

The Detroit Architectural Club showed excellent summer sketches, while, generally speaking, those of the Chicago Architectural Club were weak and amateurish. Among the individual exhibits some excellent pen-and-inks were shown by Birch Burdette Long, fine and strong in character. Wilson Eyre still pursues, and catches in fact, his curious odd effects in handling of plans and perspectives, while Mr. Buck shows charming perspectives of churches.

The real interest of the architectural exhibit this year to the public has not been the architectural exhibit at all, however, but that of the Society of Arts and Crafts, which has been extended a hospitable welcome within the galleries. The exhibition is certainly most interesting, and some features of it very beautiful. The desire for crude work on the part of its members comes out most strongly in its wood-carving department, and there its contributors revel in little design and no design, executed in the heaviest, most crude way. They say, "Oh, we must have the expression of the being himself in his work!" All well and good; but suppose that being be a person of education and refined taste, should that bar out his work, because it gave evidence of this refinement: because his settles were not built on the crude plan of a dry-goods box with two sides knocked out, because his chests were not huge enough and heavy enough to bury a Viking in, armor and all, should they find no

place in an exhibit like this of the Arts and Crafts? Many of the leaders in this Society seem to have forgotten that this is not the beginning; men have worked with their hands ages before they, these same leaders, graduated from the rubber ring or ivory rattle, where they took their first training in handicraft. It is a curious side, this lack of appreciation by hand-workers of work which has risen by a system of evolution so much nearer perfection than much that is accomplished by members of the Society. It is naturally not so much in evidence in the actual exhibit, as accentuated by the talk of the individual members and the general sentiment expressed in the various letters to the papers. It seems as if it could only be a passing phase, if the association is one which has come to stay and to grow, and that the growth in good work cannot help but be such as will make its members look back on much which is here exhibited as crude and amateurish. One exhibit shows some curious Norwegian furniture, very attractive in design and coloring, and much of the metal-work is very good. A curious treatment of oxidizing copper produces the most glorious rainbow effects in nut-bowls, ladles, etc., several being exhibited by Mr. and Mrs. Homer Taylor, while Mrs. Madeline Yale Winn gives us delightful specimens of her metal-work and enamels. A daughter of the cunning artificer who fashioned the Yale lock, one feels that literally the iron must have entered his soul, that he could bequeath to his daughter this so subtle appreciation of the mystic qualities of metals. There is charming jewelry designed by Mrs. Eleanor E. Klapp, some by T. S. Ashbee of Essex House, London, beautiful examples of Favre glass, Delaherche pottery, Japanese porcelains, which take a certain side of the exhibit far out of the realms of the amateurs. Standing half-way towards these goals of perfection are the charming exhibits from the Dedham and Rookwood potteries. It seems almost alone in the matter of furniture that the Society wants no inspiration from perfect work and ignores the possibility of anything good which is not archaic. It is certainly a most interesting exhibit, and a Society, which, if well fostered, would bear good fruit in pleasure and profit to all concerned with it.

PRESERVATION OF SPANISH HISTORICAL BUILDINGS.

A MEMORANDUM was prepared in the Ministry of Fomento on the subject of the conservation and restoration of public monuments in Spain. From an early date monuments of interest in that country have had State protection. In 1865 a commission was established in each province for the control of the remains and placed under the direction of the Royal Academies of History and Fine-Arts in Madrid. The number of monuments declared to be "national" is stated to be over sixty, but it is proposed to publish accurate statistics about them. The cost of any works executed is borne by the province or town in which the monument is situated.

The following are the regulations of the provincial commissions of historical monuments which were approved December 30, 1881:—

In each province there shall be a Commission of Historic and Artistic Monuments composed of the corresponding members of the Royal Academies of History and Fine-Arts of San Fernando. In the provincial capitals where the number of corresponding members, whether of the Academy of History or of the Academy of Fine-Arts, shall exceed six, only five members designated by each Academy shall form part of the commission. The Academies are empowered to reorganize these commissions whenever they think fit.

In addition to the corresponding Academicians mentioned above, the following shall be *ex officio* members of the provincial commissions of monuments: The inspectors of antiquities, the provincial (State) architects, the chief of the Home Department, the chief librarian and curator of the archives, whenever the provincial capital possesses a library.

In provinces where there are academies of fine-arts, these shall submit to the Royal Academy of San Fernando three different lists of three names, one list for each section, with a view to the election, by the said Royal Academy, of three members who shall form part of the Commissions of Monuments. The said lists shall be submitted by the presidents of the respective (provincial) academies.

The provincial commissions are to be considered the local representatives of the two Royal Academies. The presidency of the Commissions of Historical and Artistic Monuments shall be held by the governors of the respective provinces. At all functions at which the members of the provincial commissions are present in a corporate capacity they shall take rank with other provincial corporations.

The duties of the provincial commissions of monuments are: (1) The preservation and restoration of national historic and artistic monuments. (2) The supervision, improvement, augmentation or creation of provincial museums of fine-arts. (3) The direction of excavations of national interest. (4-7) The control of museums of antiquities, the acquisition of objects of art, MSS., etc. (8) The professional and archaeological examination of public monuments to prevent their decay and check restorations of an incongruous nature, or such as are calculated to endanger the artistic value of the buildings. (9) The preservation of the tombs of kings and illustrious men. (10) Intervention in all public works undertaken with municipal, provincial, or public funds on ancient sites, in the vicinity of the great Roman roads, or in any other place where the existence of ancient buildings is suspected, in order to prevent the loss or ab-

straction of such objects of artistic or archaeological interest as may be discovered.

The Commissions of Historical and Artistic Monuments, in view of the objects which they are constituted to accomplish, shall act as consultative bodies to the governors of the respective provinces in all that concerns their particular sphere. The provincial commissions shall accordingly be required to furnish all information requested by the governor as to the value and importance of the artistic monuments in the province under his charge which stand in need of repair, to draw up an annual estimate of all works necessary for the preservation of artistic monuments at the cost of provinces or municipalities, as also of the additions to be made to the museums of art and archaeology.

Provincial governors shall take no final resolution on matters referred to in the foregoing article without previously consulting the provincial commissions of monuments, nor shall they execute such resolutions without communicating with the Royal Academy more especially interested, unless the urgency of the case shall make such communication impossible. When this is the case, they shall immediately inform the Royal Academy which the resolution adopted more immediately concerns.

In their dealings with the governors, the provincial commissions shall take the initiative in protesting against the commencement of any projected works on public buildings until the Royal Academy of Fine-Arts or of San Fernando shall have exercised the right of previous examination, or deputed the provincial commission to act on its behalf. Such examination shall be obligatory in all cases of restoration, modification or construction of new buildings, whether such buildings are complementary to the old ones or not, and are or are not accessory works of art. It must always be carried out, whatever may be the civil or religious nature of the buildings in question, or the uses to which they are destined. The commissioners shall order the suspension of all unauthorized works until such time as a definite resolution shall have been taken in the matter. In making representations against any immediate alienation, demolition or destruction of any monuments of real value or national interest, whatever pretext may be alleged in favor of destruction. In proposing the prompt restoration of artistic buildings belonging to provinces or municipalities, the stability of which appears to be imperilled. In preventing the sale to foreign countries of important historical and artistic objects, and in proposing the acquisition of pictures, statues, etc. In making any proposals conducing to the objects for which they were appointed.

In like manner the duties of the provincial committees towards the Royal Academy of San Fernando, which is invested by law with all the powers of Central Commission of Monuments, shall be as follows: 1. To furnish all information and supply all facts requested in order to insure the suitable decision of all matters committed to their charge. 2. To submit, for the examination and approval of the Academy, all plans for the restoration of buildings entrusted to their care whenever these are of an important nature, or whenever any alteration in the form or character of the building shall seem likely to ensue. 3. To make an annual return of their respective estimates and their expenditure in all that refers to the preservation of artistic monuments and museums of fine-arts.

The cost of preservation and restoration of historic monuments, the institution and augmentation of museums of fine-art, the acquisition of pictures, statues, carvings, and other objects with which the Royal Academy of San Fernando is especially concerned, shall be met: 1. Out of the funds already assigned, or hereafter to be assigned, to the commission of monuments in the provincial estimates. 2. Out of sums set apart for similar purposes in the Government estimates. 3. Out of extra grants which may be made by the Government on special occasions at the request of the Royal Academy.

The provincial commissions shall devote their regular labors to the formation of a catalogue *raisonné* of all edifices existing in their provinces, the artistic value or historical importance of which make them worthy of a place in the "Statistics of Monuments" projected by the Central Commission of Monuments.

Provincial governors and mayors of towns are to lend the provincial commissions the most efficacious support in their power, supplying them with all the information they require in order to accomplish the object for which they have been appointed, and endeavoring to remove any obstacles opposed to the regular exercise of their duties.

— *The Architect.*

TOMBS OF EGYPTIAN KINGS DISCOVERED AT THEBES.

AS a sequel to his discovery of the tomb of King Thothmes III, at Thebes, M. Loret, Director General of the Antiquities Department, has discovered and opened the tomb of Amenophis II, a king of the eighteenth dynasty, who reigned some 1,500 years B. C. The find is among the most interesting ever made in Egypt, as, although the jewelry, etc., were rifled from the tomb probably during the twentieth dynasty, the mummies of Amenophis and of seven other kings are intact. The tomb is entered by a steep inclined gallery, which terminates in a well of some twenty-six feet in depth, and, this obstacle surmounted, the entrance to the King's sepulchre is reached.

In the first chamber the body of a man is found bound to a richly painted boat, his arms and feet tied with cords, a piece of cloth

stuffed as a gag into his mouth, and marks of wounds on the breast and head. In the next chamber are laid out the bodies of a man, a woman, and a boy. None of the four bodies has been embalmed, but owing to the dryness of the atmosphere they are all in the most complete state of preservation, with the features perfect; and, although they evidently met with violent deaths, they have the appearance of being asleep. The hair upon each is luxuriant, and the features resemble to a marked degree those of the fellahin of the present day.

The King's tomb is a chamber of magnificent proportions in perfect preservation. The roof, which is supported by massive square columns, is painted a deep blue, studded with golden stars, and the walls are entirely covered with paintings, the colors of which are as vivid as if laid on only yesterday. At the end of this chamber, in an excavation sunken several feet below the level of the rest of the floor, is the sarcophagus of the King, placed upon a massive block of alabaster. The sarcophagus is of sandstone, artificially colored a bright rose hue, and contains the mummy intact, with chaplets of flowers round the feet and neck.

In a small chamber to the right are nine mummies, two of them bearing no names and the others those of the Kings Thothmes IV, Amenophis III, Set Nakht, Seti II (supposed to have been the Pharaoh of the Exodus), Rameses IV, Rameses VI, and Rameses VIII, who all reigned between about 1500 and 1150 B. C. The tomb is that of Amenophis II, for whom it was built, and is supposed to have been opened later to receive the mummies of the other kings, probably to save them from violation. The floors of all the chambers are covered with a mass of objects—statues, vases, wooden models of animals, boats, etc., requiring immense care in sorting for removal.

The whole constitutes one of the most impressive sights that can be imagined. For the first time on record, the body of an Egyptian king has been found in the tomb prepared for him, as previously discovered royal mummies had been removed from their tombs and secreted for safety at Deir el Bahari. Possibly this discovery of the bodies of murdered victims in a king's tomb may throw some light upon the vexed question of human sacrifices which now divides Egyptologists.

The Public Works Ministry has requested M. Loret to remove only the smaller objects and to leave the mummies and bodies in their present place. The entrance to the tomb will then be built up until next winter, when iron railings may be placed to prevent injury from touching by visitors, while affording them the unique sight of the lying-in-state of a king who reigned over 3,400 years ago. — *London Times*.



SKETCH-CLUB OF NEW YORK.

THE regular monthly meeting of the Sketch-Club of New York was held on Saturday, May 7th, at 8 P. M., at the offices of Messrs. Cady, Berg & See, architects. Notice was given of the abandonment of the Club-rooms, it being the intention to obtain more suitable rooms during the summer.

The Constitution was amended so as to do away with the Advisory Board, and to have a current-work committee appointed.

On account of the excellent work done by the Water-color and Life Classes the desire was expressed to form new classes, especially for Historical Research, in the fall.

It is the intention during the summer to take sketching trips, and an exhibition and competition at the end of the season for the best collection of mounted sketches.

A very interesting talk on "Student's Life in Paris" was given by Mr. Hornbostel.



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

SWOPE MEMORIAL REREDOS: TRINITY CHAPEL, NEW YORK, N. Y. MR. F. C. WITHERS, ARCHITECT, NEW YORK, N. Y.

[Gelatin Print, issued with the International and Imperial Editions only.]

A COMPETITIVE DESIGN FOR THE PUBLIC LIBRARY, HYDE PARK, MASS. SUBMITTED BY MR. J. G. GLOVER, ARCHITECT, BROOKLYN, N. Y.

The cost of this building, executed in brick, terra-cotta and stone, with copper roof, by cubing at fifteen cents per cubic foot, was found to be about \$20,000.

FIRST UNIVERSALIST CHURCH, SANGERVILLE, ME. MR. F. R. COMSTOCK, ARCHITECT, HARTFORD, CONN.

THE FULLERTON-TERRY BUILDING, ST. LOUIS, MO. MR. W. A. SWASEY, ARCHITECT, ST. LOUIS, MO.

HOUSE NOW OCCUPIED BY THE ORTON & NICHOLS SCHOOL, NEW HAVEN, CONN.

This house was built about 1820.

FIRST BAPTIST CHURCH, RANDOLPH, MASS. MR. W. J. PAINE, ARCHITECT, BOSTON, MASS.

THE prominent parts of the building are of stone, faced with Weymouth seam-faced granite, for a height varying from six to twenty feet. Other parts are of wood construction, covered with shingles and with Cabot's creosote stains. The auditorium has a seating-capacity of 350 persons, and the lecture-hall, which is connected with the auditorium by glazed slides, a seating-capacity of 250. All windows have leaded glass of appropriate pattern, those in the auditorium being of memorial design and presented by members of the congregation. The interior finish, throughout, is of whitewood, stained. The entire cost, including clock, bell, organ and pews, is about \$18,000.

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

CARVED WOODEN DOOR: ST. MACLOU, ROUEN, FRANCE. JEAN GOUJON, SCULPTOR.

BORDER DESIGNED BY VIOLET-LE-DUC.

This plate is copied from Baron Taylor's "*Voyages pittoresques*."

[Additional illustrations in the International Edition.]

ENTRANCE: NATIONAL BANK OF COMMERCE BUILDING, NASSAU AND CEDAR STS., NEW YORK, N. Y. MR. J. B. BAKER, ARCHITECT, NEW YORK, N. Y.

[Gelatin Print.]

THE spandrel figures and the other decorative carvings were modelled by Mr. H. P. Peterson.

TOMB OF BERNADO GIUGNI, IN THE BADIA, FLORENCE, ITALY. MINO DA FIESOLE, SCULPTOR.

This plate is copied from *Teknisk Tidsskrift*.

CENTRAL BAY OF THE TOWN-HALL, BOCHOLT, WESTPHALIA.

This building, in the Bishopric of Munster, was begun just before the outbreak of the Thirty Years' War, and the interrupted work was resumed on the conclusion of peace, and the building finished at a cost of 11,000 Prussian thalers. Owing to its nearness to Holland the design of the building is founded rather on Dutch than upon German lines. This plate is copied from *Zeitschrift für Bauwesen*.

ROLLESTON HALL, BURTON-ON-TRENT, ENG.: THE DRAWING-ROOM.

PREMISES: LIONEL ST., BIRMINGHAM, ENG. MESSRS. CROUCH & BUTLER, ARCHITECTS.



WELL-BORING.—An interesting résumé of the various methods used in sinking wells and bores was given by Mr. Maurice Ockenden in a paper recently read before the Society of Civil and Mechanical Engineers. The art was stated to be a very old one. Egyptian examples had been known having an estimated age of 4,000 years. Other ancient bores were to be found in China; but in Europe the oldest-known bore was in Lilliers in the Artois, France, which dated back to 1126. Leaving aside the Abyssinian tube wells as adapted only to shallow depths, the author classed the different methods of sinking bore-holes under four principal heads, viz.: 1. The English hand and steam boring methods. 2. The Danish, or Fauvelle, system (hydraulic). 3. The Canadian, or American, rope system; and 4, diamond boring. The English method was used exclusively in this country until quite recently. The boring tools used were plane chisels, T chisels, twist-bits, and open and close augers. These are arranged to screw on to solid boring bars usually made up of lengths of square bar iron screwed together, the top bar being fitted with a swivel attached to a rope, and connected over the derrick to a winch. This system was slow, but was economical for bores 3 inches to 6 inches in diameter, and for depths up to 400 feet, provided the strata were favorable, work through rock

being very slow. The Danish, or Fauvelle, system was particularly suited for work in soft rocks and clays. In this system the boring bar was tubular, and a constant supply of water was forced down the same and washed away the debris made by the boring tool. In soft ground the water itself did nearly all the excavating. The author stated that in Alabama he had sunk a 4-inch bore-hole on this system to a depth of 426 feet, the diameter being the same at the top as at the bottom; while with the English system it would have been necessary to diminish the size several times in the depth named. The system avoided the constant cleaning out and shifting of the tools necessary with the latter, as a chisel only was necessary. Nevertheless, for small work the Danish system was considered costly, as the time needed to get under way and the cost of carriage were greater than with the English system. For large holes in varied or hard rock the Canadian, or American rope-drilling, system was the best. The leading feature of this system was the employment of a short string of bars about 30 feet long, carrying at the end a massive chisel. These were suspended from a rope running over the derrick and attached to a walking beam moved up and down by steam-power at the rate of about 30 strokes per minute. The derrick was built sufficiently high to swing the string of tools without disconnecting them, so that the sand-pump could be inserted and withdrawn from the bore hole without interfering with the boring tool. Much time was thus saved. The diamond-boring system was the most costly but also the most rapid, and since a true core of the strata or section passed through was obtained, it was especially adapted for prospecting work. A drawback to its use was the large supply of water needed to keep the diamonds in the trepan head, which did the cutting, off the debris. Another method used in France was also deserving of notice. It was known as the "Mouton" system, and was used more particularly for penetrating rock. The *mouton* was a cylinder of cast-iron about 8 inches in diameter and 30 inches long, and weighed from 1 cwt. to 3 cwt. The upper part of the cylinder was hollowed into a conical form, and the sides were filleted so as to permit the debris of the rock to pass up and lodge in the conical cup. At its lower end the *mouton* was fitted with a set of blunt-pointed chisels, while at its upper end it was attached to a rope by means of two wrought-iron handles. In working, the *mouton* was vibrated up and down 25 to 30 times a minute, pulverizing the rock below. The debris thus produced, forming a liquid mud with water added to this end passed up the fillets in the side of the *mouton* into the conical cup already mentioned. When full the *mouton* was drawn to the surface, and the debris thus collected emptied out. — *Engineering*

REMOVING RUST FROM IRON ELECTRICALLY. — A simple and effective way of clearing rusted iron articles, no matter how badly they are rusted, consists, according to Carl Hering, in attaching a piece of ordinary zinc to the articles and then letting them lie in water to which a little sulphuric acid is added. They should be left immersed for several days, or a week, until the rust has entirely disappeared, the time depending on how deeply they were rusted. If there is much rust a little sulphuric acid should be added occasionally. The essential part of the process is that the zinc must be in good electrical contact with the iron; a good way is to twist an iron wire tightly around the object and connect this with the zinc, for which a remnant of a battery zinc is suitable, as it has a binding-post. Besides the simplicity of this process, it has the great advantage that the iron itself is not attacked in the least as long as the zinc is in good electrical contact with it. When there is only a little rust a galvanized-iron wire wrapped around the object will take the place of the zinc, provided the acid is not too strong. The articles will come out a dark gray or black color, and should then be washed thoroughly and oiled. The method is specially applicable to objects with sharp corners or edges, or to files and other articles on which buffing wheels ought not to be used. The rusted iron and the zinc make a short-circuited battery, the action of which reduces the rust back to iron, this action continuing as long as any rust is left. — *Electrical World*.

A FIRE-RESISTING CEMENT. — A new fire-resisting cement has lately been subjected to a careful test in Germany, and an official protocol has been issued concerning its behavior which bears the signatures of several architects, engineers and other experts. The trial was conducted in a wooden house built for the purpose, the walls and roof of which, and an iron girder supporting the roof, were coated with an inch-thick layer of asbestos. The structure was partly filled and surrounded outside with a mass of shavings and wood chips soaked in petroleum, and the whole was set alight and allowed to burn for about three-quarters of an hour. The fierce conflagration was then extinguished by means of hose, when it was observed that the asbestos showed no sign of either cracking or peeling. When it was at length chipped off in various places, both the iron and wood of which the structure was composed were found perfectly intact. It may be mentioned here that the huge fireproof curtain which separated the stage from the auditorium at the late "greatest show on earth" at Olympia, London, was coated with asbestos. The source of this new fireproof compound has already been explained in our columns. — *Chambers's Journal*.

TRANSPARENT LEATHER. — According to a recent German patent, in order to make hides transparent and hornlike, the skin is heated in oil, vaseline, or fat, without any previous tanning. The skin thus treated assumes a horny structure, to which a glassy appearance can be given by polishing. The skin becomes thicker during the heating; the length of time necessary for the heating process depends upon the structure and resistance of the skin. When thus treated, the skin is pressed, dried, and polished. It is almost transparent, and any degree of toughness can be imparted to it; it can be shaped into any desired form and treated in any convenient manner to produce articles of commercial value. It is almost incombustible, and can be used in place of celluloid, horn, and wire, and can be used in electrical work to replace hard rubber, being cheaper and more durable. — *Invention*.

THE GOLD IN THE SEA. — A German mathematician has calculated that three tons of sea-water hold about a cent's worth of gold, and that if all the gold in the oceans of the globe could be collected it would make a solid cube measuring 718 metres on each side and worth about \$1,450,000,000,000,000. — *N. Y. Evening Post*.

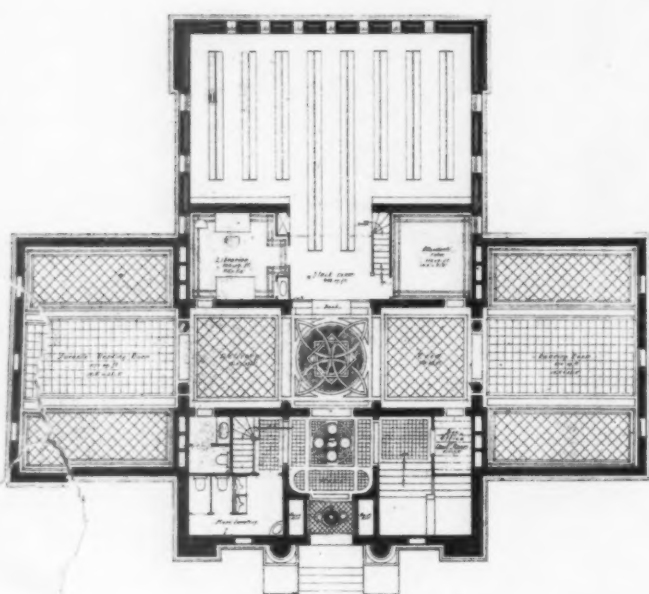
DISCOVERIES OF FRESCOS AT ROME. — An interesting discovery of frescos has just been made in the senatorial palace at Rome. For several days workmen had been employed to remove a wall which showed signs of weakness, and in the course of demolition a number of mediæval frescos were discovered, one of which represents the "Annunciation." The colors are extremely vivid and well preserved. When the operations have been completed it is hoped that further discoveries will be made which will enable archaeologists to form an accurate idea of the internal and external decoration of the Senate in the Middle Ages. — *Boston Transcript*.

WAR'S EFFECT ON SOUTHERN LUMBER TRADE. — The lumber exports from Jacksonville this month promise to be much below the normal, and will show a very decided falling off. This condition is not due to the dulness of the trade, or to a lack of orders, but rather to a scarcity of bottoms in which to transport the products to the North. Lumbermen in Jacksonville complain that they cannot secure vessels at any price, and this being the case very few shipments are being made from this port. While there are almost any number of vessels lying idle in Northern ports, they are afraid to come South on account of the war scare, and this, too, despite the fact that charter rates have been advanced very materially. The rate from Jacksonville to New York per 1,000 feet of lumber is usually \$4.75, but as high as \$5.50 has been offered recently, and no charters can be obtained even at that figure. — *Jacksonville, Fla., Times-Union*.

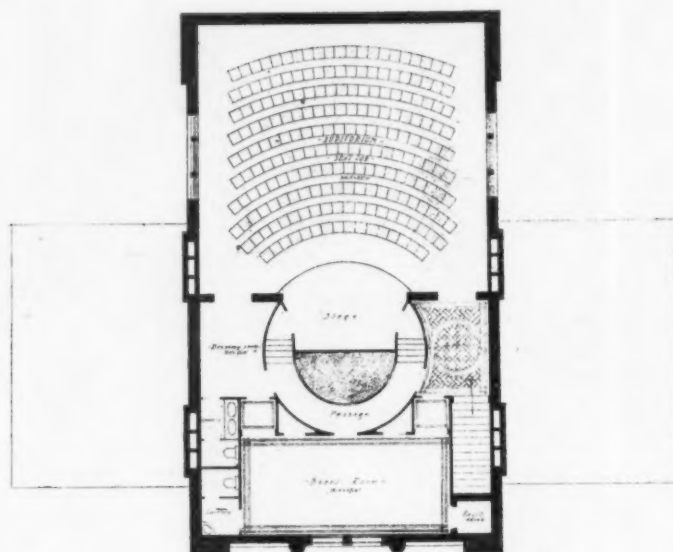
CROMWELL'S BODY ALLEGED TO LIE AT WINDSOR. — It now turns out that the mysterious coffin, and well-preserved remains, recently discovered at Windsor, and which were supposed to be those of King Edward VI, are not those of that monarch at all, who is buried at Westminster Abbey, but of Oliver Cromwell, the only president of an English republic. It has always been known that the body unearthed at the time of the Restoration, gibbeted at the north end of Fetter Lane, and thereupon buried, headless, at the foot of the gallows, was not really that of the great Protector, whose corpse had been secretly interred by his family, immediately after his death, who foresaw the Restoration, and feared the desecration of his tomb. The remains just discovered at Windsor present all the physical peculiarities of old Noll, while the body is arrayed in precisely the same garments as those in which Cromwell is described by history to have been arrayed in after his demise. — *Marquise de Fontenoy in the Philadelphia Press*.

SMOKELESS FIRES. — The Berlin correspondent of the *Times* has given some particulars of a new invention by one Carl Wegener, which has for its object the elimination of smoke from a furnace, accompanied by a notable saving in the consumption of coal. This invention, we are told, is shortly to be brought before the British public in the form of the usual limited company. The success of the system depends upon feeding the furnace with powdered coal, instead of the "well-screened" lumps which have hitherto been regarded as the most advantageous form of such fuel. The cold-dust is fed into the fire from a container in front by means of a tube which terminates in a revolving sieve. This sieve is kept in motion by the draught, and has the effect of scattering the fuel over the furnace in such a way that it is at once inflamed without smoke and with very little ash. Coal of comparatively low quality can be economically used in this powdered form, and the only drawback to the process seems to be the necessity for using a separate machine for the grinding of the coal to powder. On the other hand, the slack or dust which forms a necessary by-product of the coal industry will find here a field for employment which will be much appreciated by owners of mines and merchants generally. — *Chambers's Journal*.

USES FOR LIQUID AIR. — By means of liquid air the effect of temperature upon metals can be studied with ease, and it is seen that temperature has a great deal to do with ductility, tenacity and hardness. When subjected to very low temperatures the colors of many substances change, and some of the most brilliantly colored salts become nearly white when brought to the temperature of -191 degrees C. Again, it has become possible to test the theory of the electrical conductivity of metals at very low temperatures and to verify the laws which, before, were largely based upon theoretical considerations and tests between comparatively high limits. All these, however, are laboratory experiments. But would not any one of them justify the thought and work which have been devoted to the production of liquid air? In the line of the practical application of liquid air little has been done, but the possibilities seem great. When drawn from the machine the liquid is composed of a mechanical mixture of oxygen and nitrogen in the proportions of about 1 to 5. As the boiling-point of oxygen is slightly higher than of nitrogen, the latter evaporates first, and after a few hours' exposure the remaining liquid contains about 75 per cent of oxygen. There seems to be no reason why this liquid should not be expanded into cylinders, and then used for the oxy-hydrogen light and other commercial purposes, where it would compare very favorably in purity with gas now prepared by chemical action. As a refrigerant the liquid will probably have a wide field, the apparatus for its preparation being very simple and requiring little attention. Its use as a means of transferring energy has been from the first one of the problems to be worked out, and while nothing definite has been determined in this line, yet it is believed by persons who are as capable of giving a judgment as any that the day is not far off when small motors such as are now used for driving street-cars and light machinery will be run by the boiling of liquid air. — *American Machinist*.



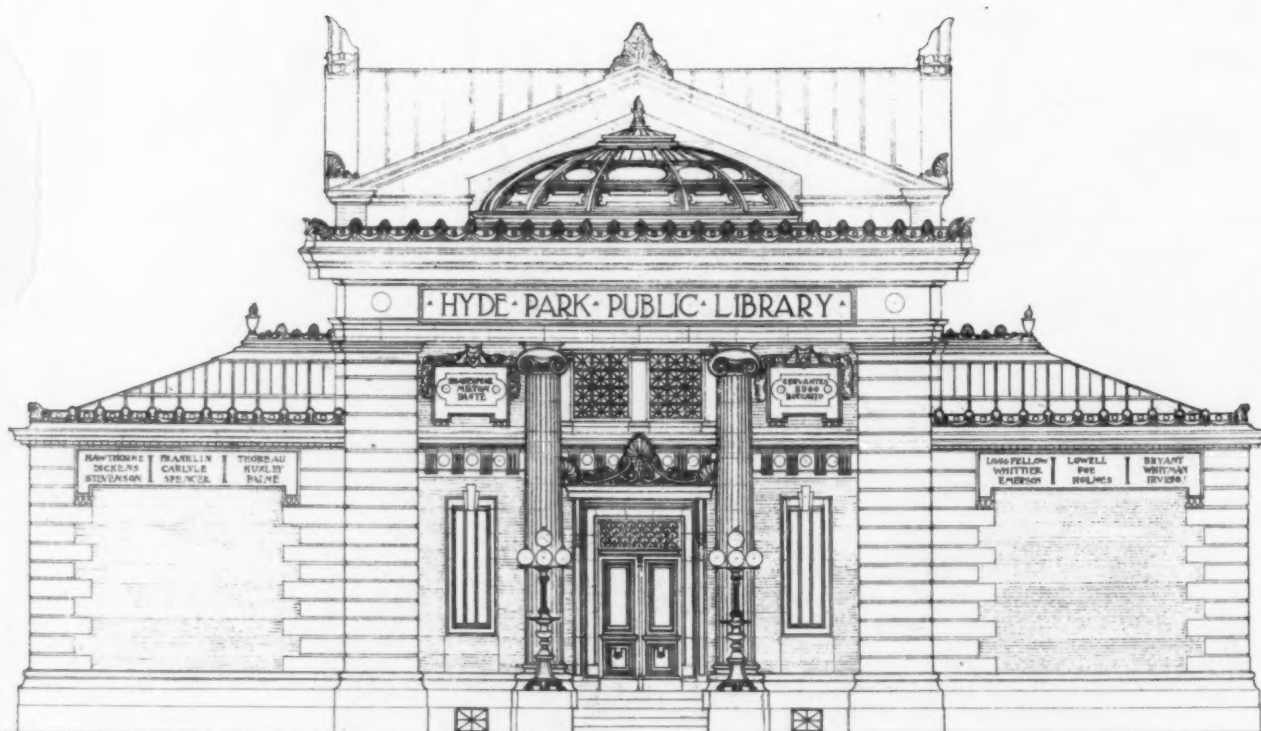
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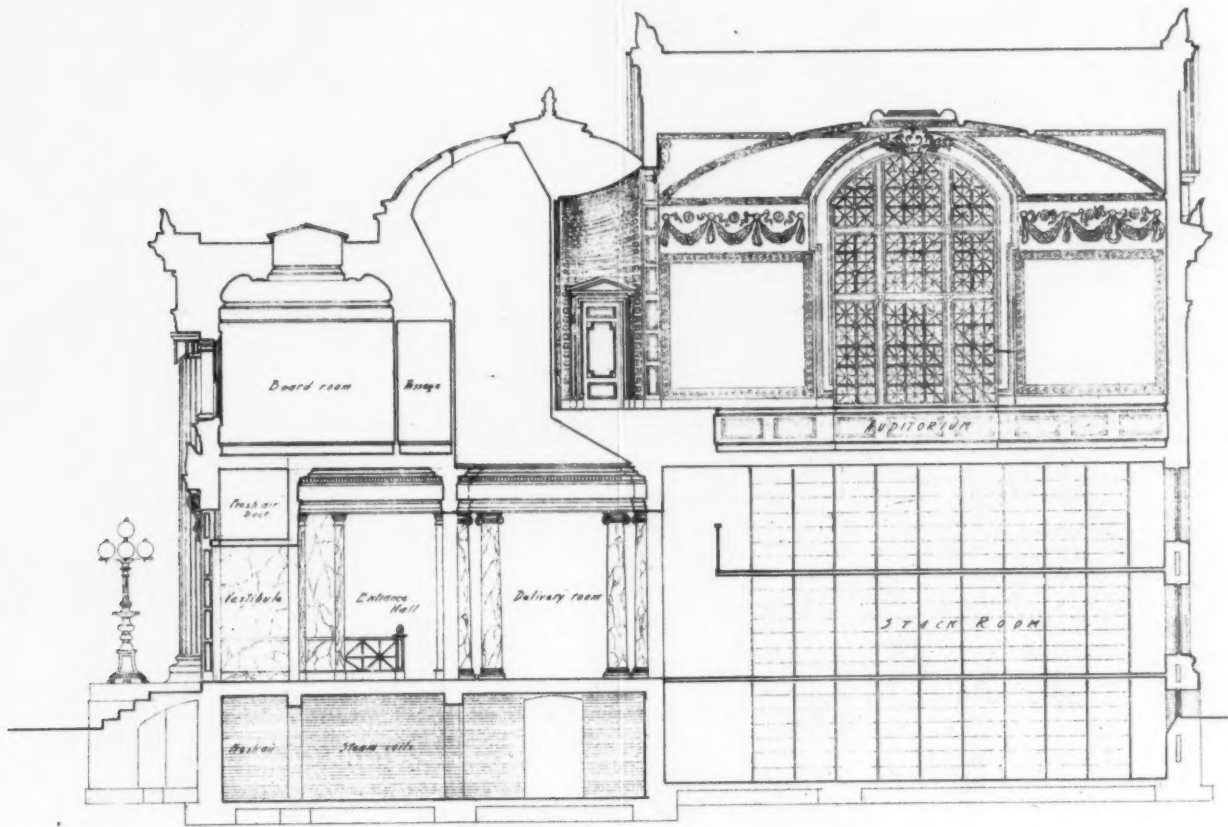
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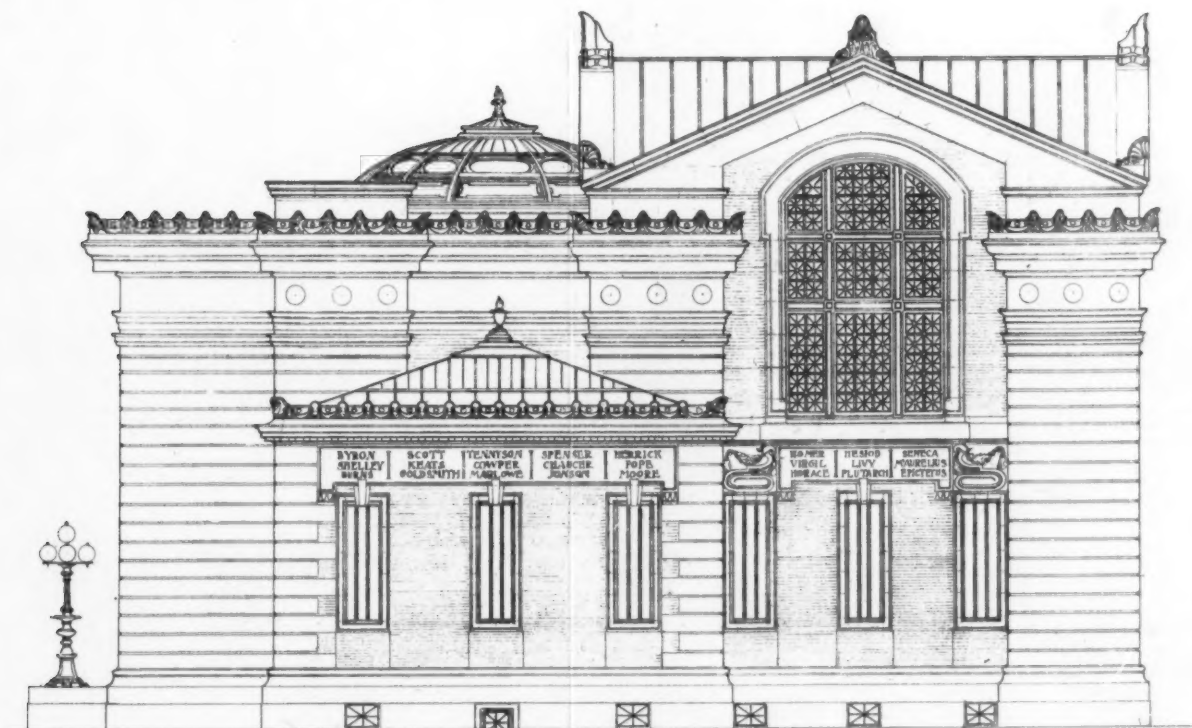


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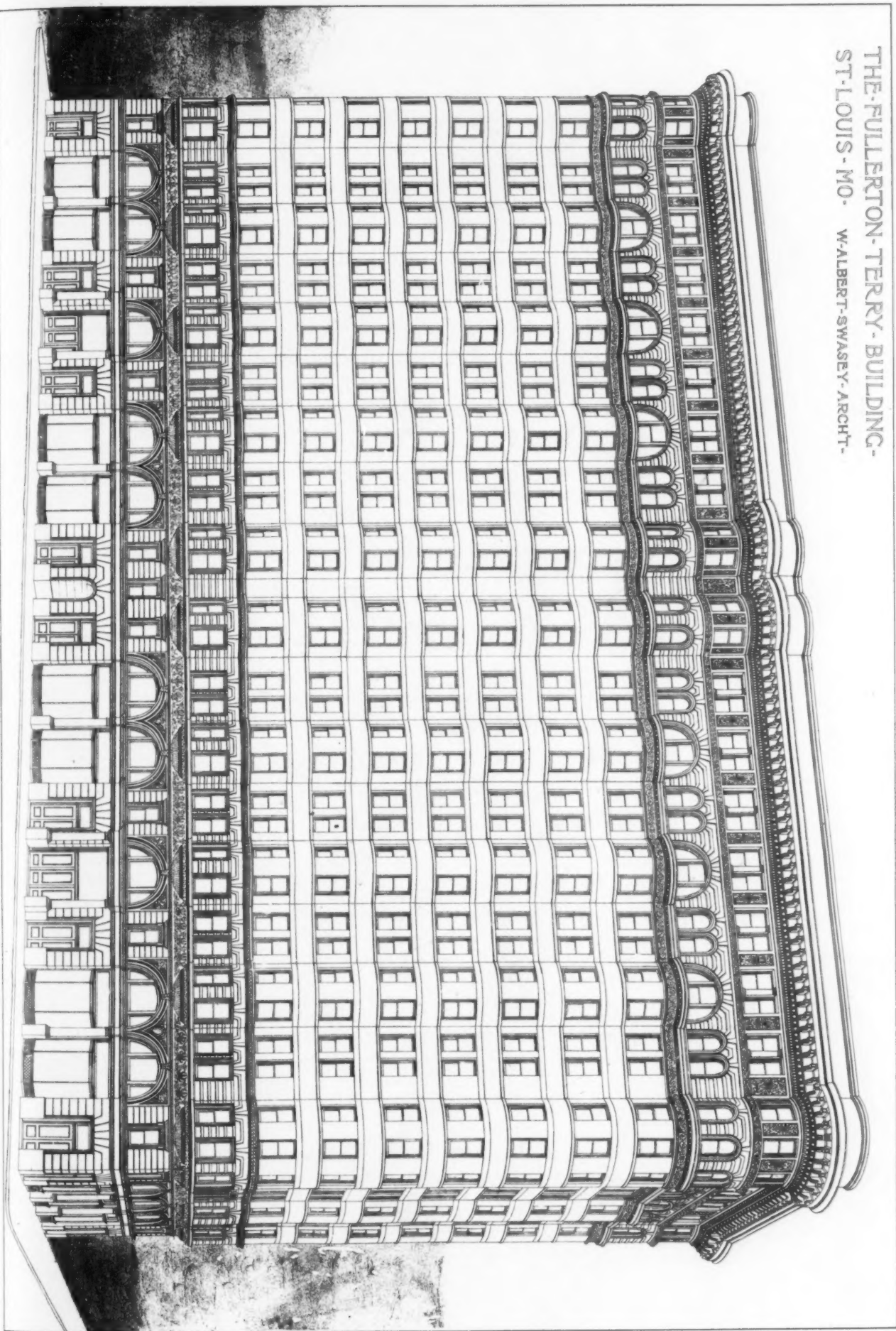


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