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THE extension of the east front of the Capitol at Washington, which has so long been under discussion, is likely to be authorized, and six million dollars appropriated for carrying out the work, and for constructing a new office-building for the members of the House of Representatives near the Capitol grounds. The extension of the Capitol is to be carried out substantially as designed by Dr. Walter, many years ago, and will, as it seems to us, add to the beauty of the building. The proposed office-building, as shown in the newspaper cuts, is, on the contrary, painfully ugly, and we trust that professional opinion, vigorously expressed, may yet be able to save Washington from being afflicted with it. To those of our readers who have not seen the cuts we may say that the design shows an exaggerated specimen of the circular portico effect which seems to be favored in official society in Washington, and which Colonel Bingham so nearly succeeded in imposing, in a less objectionable form, upon his suffering country in connection with the alterations of the White House. To describe it briefly, the proposed Congressional office-building, which may cost nearly four million dollars, has no corners, the place of each corner, the indispensable element in the firmness and solidity of effect of a monumental building, being taken by a huge, bulging, weak portico, semicircular in plan, planted diagonally on what should be the angle of the building, and utterly destroying anything like breadth and dignity. As if this were not enough to make the building ridiculous in comparison with the beautiful Capitol, close by, the cut of the office-building shows two pediments, treated, with an originality which we regret our inability to commend, as transepts, the roofs behind them showing high above the balustrade, and disappearing, in perspective, into space, apparently in search of something to stop against. The designer of these extraordinary features seems to have thought that the slope of the lines of a pediment was a matter of indifference; or, possibly, that a peaked gable in the middle of each front would distract attention from the painful corners. Undoubtedly, it would do so for a moment, but only to add to the regret with which every lover of art would view the whole composition.

WE are sorry to have to speak so of the work of a designer who is, undoubtedly, a worthy and hardworking person; but it is necessary, to protect the public against the defacement of what should soon be the noblest and most beautiful city in the world, for those who have spent their lives in studying and comparing the best, as well as the worst, existing specimens of architecture, and who can judge with certainty from a drawing the effect of the actual building which it represents, to speak plainly when they see the work of an ignorant tyro in design put forward, to be set beside the pearl of all the public buildings of the earth, the Capitol at Washington.

ONE part of the plan for enlarging the Capitol will, as we sincerely hope, be abandoned. This is the scheme for finishing the Brumidi frieze in the Rotunda. It is now a good many years since we first blushed with shame at seeing the little man on the staging, painting a ridiculous and transparent falsehood around the walls of the central room of the American Capitol; and time has not changed our opinion of the work. Even as a piece of drawing, the Brumidi fresco is below mediocrity in itself, and quite unsuited to its position; while its attempt to deceive the spectator into imagining it to be sculpture would discredit far better work, and discredits the building which it is supposed to adorn. The best thing that can be done with it is to wash it off, and either leave the wall bare, or replace it with some of the beautiful American decorative paintings of which the Congressional Library, for instance, furnishes so many examples. We cannot say that we find nothing to criticise in the architecture of the Congressional Library, but much of the interior decoration need not fear comparison with that of any building in the world; and it is not only strange, but deplorable, that, when American artists have shown themselves capable of such work, the most important of all American buildings should be kept out of their hands, and abandoned to the whims of any unknown pretender who may have the ear of Congress.

ALL American architects will feel a certain pride at the news that the Council of the Royal Institute of British Architects has voted to present to His Majesty King Edward the Seventh the name of Mr. Charles F. McKim, President of the American Institute of Architects, as the recipient of the Royal Gold Medal for the present year. The last American recipient of the Medal was Richard M. Hunt; and, after ten years, Mr. McKim succeeds most worthily to the same honor.

THE revolution in the teaching of architecture in France, which has been so long under consideration, and which M. Guadet, as reporter for the Commission having the subject in charge, has studied with such admirable care and knowledge, is at last complete; and architecture is to be taught to young people in provincial towns in the same manner, and under the same rules, as in the School of Fine-Arts in Paris. The plan for the new regional schools, which has been finally adopted, provides that candidates for admission shall be examined all over France on the same day, and that their work shall be judged by a mixed jury of Parisian and provincial architects, so that the standard shall be the same everywhere; and, after admission, the students of the regional schools are entitled to take part in the competitions for all the medals and prizes of the School of Fine-Arts, including the Concours Rouvevin, the Concours Blouet and the Concours Godebeuf, and the American prize, on the same terms as the Parisians. The examination for the diploma in architecture is still to be held in Paris, but the "values" required to entitle a candidate to enter the examination may be gained either at Paris or in the regional schools; and the jury for the diploma is to include two representatives of the regional schools. Already, the authorities of the principal provincial cities have been notified of the decision of the Government, and a certain subsidy from the public treasury has been assigned to each; and a Commission, consisting of MM. Guadet, Pascal and Blondel, with M. Crost, Chief of the Government Bureau of Instruction, is about to start on a tour of the provinces, to select places for accommodating the regional schools, and to concert with the local authorities the details of their management.

WE have already spoken of the important influence which this step is likely to have upon the development of French architecture; but the definitive creation of the new schools brings up more vividly the prospect of the profound modifications which they are probably destined to bring about, not only in the teaching, but in the practice of architecture in France. We have never agreed with the persons who maintain that instruction in architecture at the School of Fine-Arts has been reduced to a set of formulas. On the contrary, that admirable school has never been more open than

it is now to new ideas, and it is not from any awakening of those who have it in charge that we look for a change in it, but in the impulse given to the work of the students by the admission of the provincial schools, and the consequent emulation of localities, rather than of individuals. It is obvious that young people brought up among the Roman ruins of Nîmes, for example, or in the shadow of the magnificent Romanesque of Arles, or Saint-Gilles, or Caen, will have, instinctively, a different conception of architectural beauty from those who have always lived in Dijon, or Amiens, or Beauvais; and it is in the rivalry of styles, rather than of individuals, that art has made the greatest progress. Moreover, the regional schools will unquestionably have a great influence in stimulating and encouraging architecture in the towns in which they are established, thereby tending to form those local centres which have always been characteristic of great periods of art. That the Parisian students will suffer to some extent by the admission of a multitude of additional competitors for the prizes of the School is obvious; but the provincials, including, presumably, some of the most talented students, whose very sensitiveness would deter their parents from sending them away from home, will gain immensely by having instruction brought to their doors; and, as we believe, the art of architecture will gain also.

ANOTHER question which will be brought up more prominently by this great change in the French system of architectural instruction concerns the capacity of women for architectural design. Since the agitation for provincial schools was begun, the Architectural Department of the National School of Fine-Arts has been thrown open to women. In Paris, this extension of instruction to girls has not had any very important result, Mademoiselle Morgan, a young girl of great talent, to judge by the frequent occurrence of her name in the lists of recompenses in the second class, having, apparently, given up the career which she pursued so courageously alone. In the provincial cities, however, where young girls enjoy much greater freedom than is possible in Paris, it is probable that many of them will avail themselves of the opportunity afforded by the new regional schools to gain instruction in an art which has a great attraction for many women. It is certain that such talent as they may display will be recognized and properly rewarded by the juries, and it will be of great interest to see whether the sex will show the capacity for the refined and abstract art of architecture which has already become so conspicuous in the other arts.

FEW people realize how much has been done of late in the way of improving the planning and decoration of theatres. The radical laws which have been adopted within the past ten or fifteen years in almost all countries, requiring fireproof construction for every part of such buildings, prescribing the minimum width of staircases, and insisting that every theatre shall be virtually isolated, and shall have exits on two, or sometimes three, streets, or public passageways communicating with streets, have not only revolutionized the construction of theatres, but their design and decoration also. In this country, where habit and precedent do not control artistic movements so much as they do elsewhere, the change has been very rapid, and recent American theatres offer, perhaps, greater interest for the profession than those of any other country, both in their planning and their decoration. We need not say that the American school of mural decoration is now one of the most important and progressive in the world; and in the theatres which are multiplying so rapidly it finds an admirable field for the display of its capacity.

ONE of the most extraordinary of recent theatres is one which has just been completed in Russia, in strict accordance with the rules, or, perhaps, the absence of rules, of the New Art. This remarkable manifestation of human genius has, by the way, taken deep root in Russia, and it may be imagined that the effort to produce objects more eccentric than even Russia had ever seen before has evolved some strange creations. In the particular theatre in question, the windows are arched at the bottom, instead of the top; the doors have the amazing shapes characteristic of the new fashion, and even the proscenium arch, although it has the grace to be at least symmetrical, presents curves which recall vividly the "worm that has swallowed a bone" which a French critic regards as the prototype of the motives of the "art nouveau." The plans, as published, show nothing of the decoration, and

little of the arrangement, except that the disposition of the Dresden theatre, with a summer auditorium on one side of the stage, and a winter auditorium on the other, is improved upon by putting the summer audience entirely out of doors, on benches suitably arranged; but it may be presumed that the details do not fall far short of the general design in eccentricity.

MR. ANDREW CARNEGIE, who is always giving new indications of a remarkable breadth of sympathy, has bought one of the most interesting estates in Scotland, — that of Pittencreeff, which includes the ruins of Malcolm Canmore's Tower, where Saint Margaret, the sister of Edgar Atheling, and grand-daughter of Edmund Ironside, took refuge from the conquering Normans, and where she afterwards dwelt as Queen of Scotland. The palace was afterwards extended, and new buildings added at different times, but it was always a royal residence until James the Sixth of Scotland removed to England, to assume the crown of both kingdoms. The skeleton of Robert Bruce was found in the ruins in 1819, and buried in the neighboring abbey, where still repose the remains of Saint Margaret and Malcolm. It was not until it began to be connected with English history that the old palace began to acquire sad associations. Mary Queen of Scots spent much time there before she was betrayed and carried captive into England, there to die the death of a criminal; and in the palace was born Charles the First, who expiated a blameless life by death on the scaffold in front of Whitehall, and his sister Elizabeth, the Princess Palatine, whose woes every visitor to her castle at Heidelberg has learned, and whose brave sons, Prince Rupert and Prince Maurice, upheld to the last the fame of the ancient royal house of Scotland.

WE make no charge for giving additional circulation to an advertisement which appears in the *Schweizerische Bauzeitung*, asking for a thoroughly capable and experienced "cement chemist," to take full charge of a cement-factory in Chili. The factory belongs to a stock company, and is an important one, capable of producing about one hundred thousand barrels of cement per year. An acceptable person is promised a good salary, and will have his travelling expenses to Chili paid. We must confess that it is rather mortifying to us to see, as we often do, good places in South America offered to the Swiss and Germans, rather than to Americans; but we presume that the Chilean company wishes to get the best man that it can, without regard to where he comes from; and, as some of the most expert cement chemists in the world live in the United States, it might do no harm for any one who wishes to do so to send an account of his qualifications, his present employment, and the salary that he would expect, addressed to Z P 240, Annoncen-Expedition, Zurich, Switzerland, to be forwarded to the proper parties in Chili. The expert selected will not have to reach Chili until next August; so there is time enough to carry on the necessary correspondence, even by the way of Switzerland.

THE Technical Institute at Karlsruhe has recently established a Laboratory of River Hydraulics, with appliances which deserve to be imitated by similar institutions in this country. For the purpose of studying the effect of the flow of the water of a river upon its bed and banks, an artificial river has been constructed in the laboratory, consisting of a long tank, with an inlet for water at one end, and an outlet at the other. If the effect of the current in any real stream is to be studied, a careful survey of a portion of the stream is made, and it is reproduced on a small scale in the tank. By simple mechanism the inclination of the tank is made to correspond with that of the river, and the banks are made of sand, consolidated as required by little bags of shot, which may represent the stones of a faced embankment, or the boulders of a gravelly soil, as the case appears to require. The bottom is covered with sand, to a depth of two inches and a half; and the water is then turned on. It is necessary to pour in water from the outset to the full proportionate amount, as a small stream produces very different effects from a large one, and it must be turned off in the same way. For this purpose two tanks are used, with a powerful electric pump which raises a large quantity of water into the upper end of the experimental channel. When the current has been flowing for the desired time, the inlet and the outlet are both closed at once. This leaves the model full of water, which is then drawn off very slowly, so that the sand is not disturbed.

FORTRESS CHURCHES.

THE beauty of the situation of Marseilles is incontestable; but its ancient buildings are few. One, however, is remarkable — the fortress church of St. Victor, on the south side of the old harbor: the crypt and vaults date from the eleventh century; the nave and aisles from the twelfth century. The battlemented towers were erected by Pope Urban V in 1350, who had been abbot of the monastery to which the church belonged, but of which nothing now remains. The porch is entered by a round-arched doorway. The interior is severely plain and massive.

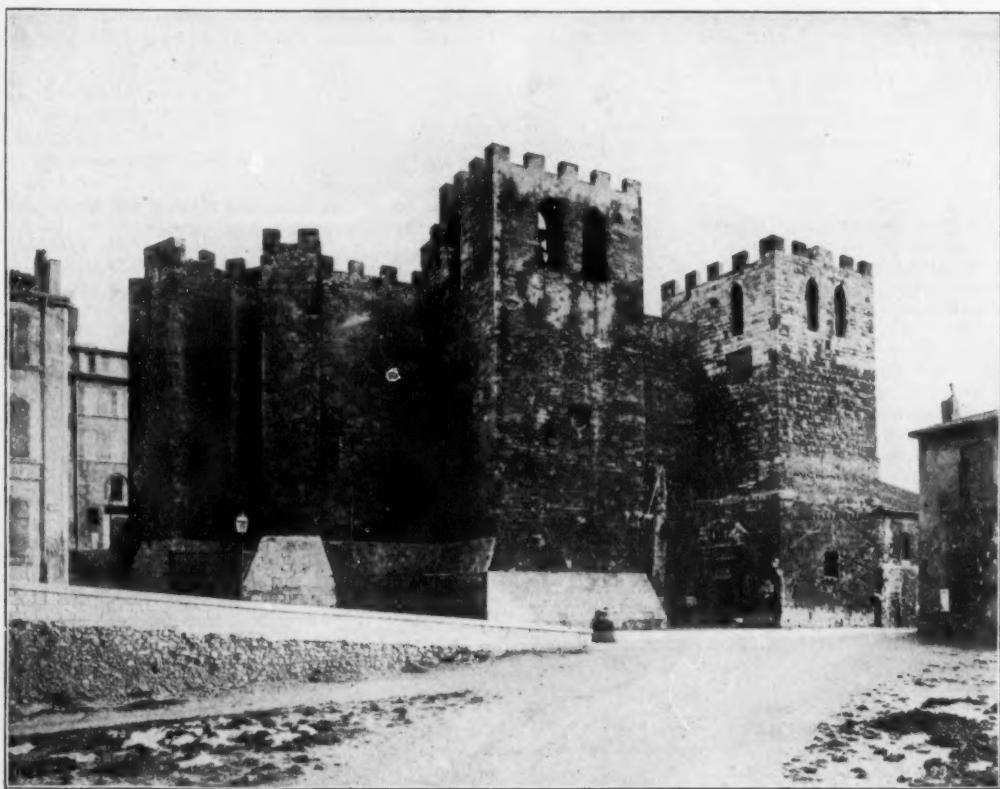
The new museum and art-school at Marseilles is grand in plan. The gardens are delightful, and behind the building is a well-stocked zoological garden, though it might be more correct to say that another façade faces the zoo, for, although not so fine as the front, it is by no means insignificant.

Another fortress church, Les Saintes-Maries de la Mer is even more interesting than St. Victor. It takes its name from having been the legendary landing-place of the Maries of the Gospel when they were expelled from Palestine by the Jews. "Tradition-history," said the fair Arlesienne of whom I purchased my photographs, with a voice carrying stern reprimand to the sceptic foreigner. Well, why not? We hold to St. Joseph of Arimathea travelling to Glastonbury; why should not the Maries have landed in Provence? May not the legend be somewhat true, that they all were sent

give the country life and mystery; but, with the mistral blowing and an almost complete absence of sun, the place was fascinating in its melancholy.

The church is interesting in its perfect simplicity and strength. At one end is a blocked-up doorway with Romanesque colonnettes on each side corresponding to those of the apse. Two or three of the capitals of these are ancient acanthus-leaves. On the outside there are two antique lions, thought to be of early Greek origin; also a mutilated bas-relief of the two saints standing up in the boat, the original design for the reliquary of the saints in the church which is used and carried in procession when all the inhabitants go down to the shore to bless the sea, the day after the annual *fêtes* in May and October. The interior of the church is rather squalid than anything else. There is a poor balustrade in front of a narrow gallery; also shabby benches and dirty chairs. The upper chapel, where the *chasse* reposes, is ornate eighteenth-century blue and gold. The reliquaries are kept in a sort of cupboard. They rest upon a staging which is pushed out into the church, and then, at the singing of the "Magnificat" they are lowered and placed upon a table in the nave. At that moment all the cripples, blind, lame and halt, are dragged or pushed to touch the *chasses*, and the people all shout, "Miracle, miracle!" for the impotent who first touches the relics is cured of his disease whatever it may be.

In the middle of the church is a well of miraculous healing powers, the bucket of which is hauled up for the afflicted. This shows the



St. Victor, Marseilles, France.

adrift, and that Mary Salomé and Mary Jacobe stayed at the landing-place, while Mary Magdalen and Lazarus went respectively to Beaune and Marseilles, Joseph to England, and Martha to Tarascon. But the ancient Provençal rhyme has it that the boat was without sails or rudder, with neither oars nor masts — showing that their enemies intended them to perish. But they drifted safely to Provence, for, as the modern painter has depicted, the boat was guided throughout the journey by angels.

Les Saintes-Maries seems the end of nowhere. You arrive by a local and extremely pottering train in ninety minutes or more. You stop frequently at level crossings to take up and set down; there are no stations. But you travel through a wonderful piece of country considering that it is a part of civilized France. Marshes, salt-lagoons, rushes, tamarisks, primitive huts covered with rush thatch, bamboo screens to keep off the wind, wild horses and wild bulls. The horses look like descendants of those brought over by the Saracens who scoured these coasts. The village is the poorest of the poor; the only industry is fishing in flat-bottomed boats, which have to be pushed through the surf by men up to their waists in the sea. Along the coast are sand-dunes and here and there tufts of poverty-stricken grass. On a dune somewhat higher than most of them is a huge cross, which is a sea-mark and a symbol of Divine protection as it stretches out its arms to those who go down to the sea in ships. In summer, storks and flamingoes, and the mirage

site of the first dwelling-place of the two Maries. For many years, some three centuries, the site was lost. The early church was destroyed by the Saracens, but discovered by a hunting count of Provence — according to the word of a hermit near by. S. BEALE.

SOME ELECTRICAL FIRE-HAZARDS.¹

THE subject that directs our attention this evening is one of vast importance to all, regardless of whether they be consumer or non-consumer, the lighting or power company, the telephone or telegraph company, or the insurance-companies.

Not much has been written upon this subject excepting by the insurance fraternity, for, while the facts remain the same, the effect of stating the true condition of affairs would have discouraged many in the use of electricity as an illuminant or for power purposes. Today, the general public is better acquainted with the facilities afforded by the use of electricity and with the dangers involved in its abuse, and in consequence the public assists materially in the advancement of this source of power. That this assistance may become of more value is most eagerly looked for, and an examination of some of the causes that may create a fire from electricity may be the means of educating the public to this desired state. We may reduce the causes to: —

¹ A paper by Mr. Washington Devereux, read October 18, 1902, before the Engineers' Club of Philadelphia and printed in the *Proceedings* of that Society.

1. Short-circuit, in which the current is impeded in its desired course.
2. A leak, in which the current flows over or takes an undesirable course.
3. The contact with parts which have become heated by the flow of current, which may be, at the time of heating, a part of the circuit from the source of supply to the consuming device.

The first cause, a short-circuit, may be defined as a circuit of low resistance. This definition is not self-explanatory, for we may have a low resistance, which resistance could be made up of any number of resistance devices connected in multiple and doing useful work, the joint resistance of which may be very low.

To enlarge upon the previous definition, we may clearly define a short-circuit as a circuit of low resistance by which the current is impeded in its desired course, and from which we derive no benefit.

The second cause, a leak, may be of high or of a comparatively low resistance. In either case it must be treated as an undesirable consuming-device attended with its many dangers.

The third cause does not require any further explanation, for our daily experience with heat from any cause, and its effect upon bodies in contact with it, is the best demonstration of its danger.

Before examining the causes denoted, it may be well to bear in mind that any one of the causes may occur in any part of the circuit, which circuit involves any part of the generation, the transmission, or the translating of electric-current.

The most simple case of a short-circuit is that in which two wires of the same circuit and of opposite polarity, and between which a difference of potential exists, are brought into electrical contact. The result of such contact is to allow an amount of current to flow sufficient to melt the fuse or to open a protecting-device, or to heat the wire to its melting-point.

It may readily be seen that a short-circuit can occur in any part of a circuit, which circuit has been defined, irrespective of the difference of potential.

Experience has shown us that in the majority of cases the protecting-devices, by which is meant the fuses and circuit-breakers, will be affected and will open the circuit, but it seldom occurs until after damage to the troubled part is effected.

We see examples of the effect of a short-circuit in which the generator, the storage-battery, the switchboard, the line, the transformer, the motors, the lamp and the operating and protective devices have been destroyed beyond repair and in some cases beyond recognition.

Several large central-station fires primarily due to a short-circuit, have occurred. One case worthy of mention is that of a lighting-station in which an arc started at the bottom of the alternating switch-board, simultaneously with a short-circuit of an alternating generator. An effort was made by the attendant to disconnect the exciters and the alternator from the circuit, but the effort proved futile, owing to the great heat attending the arcing which had spread over the entire board. In an instant the other alternators were short-circuited and the station doomed to destruction.

Another case is that in which a chain hanging from a crane made contact with the exposed live parts of a trolley power-generator, causing a short-circuit. The heat attending the short-circuit was sufficient to melt the metal, which dropped to the floor, resulting in quite a disastrous fire. From the same cause we find the destruction of motors, irrespective of the source of supply or of the nature of the work to which they may be applied; of incandescent-lamps due to the crossing of the filaments, the connecting wires, or the base of the lamp; of arc-lamp on low-potential systems; of sockets, switches, cut-outs, flexible cords, wiring on gas and electric fixtures, each of which may result directly in a fire.

The second cause, that of a leak, is possibly one of the most treacherous factors we have to contend with.

A leak, resulting in the flow of a current, may be so small that it will not affect the smallest protective device on the line. Its work is slow and in almost every case destructive and does not necessarily appreciably heat the wire unless the line is excessively fused, in which case there may be an excessive flow of current.

This leak can exist at any point and is usually due to dampness; it is difficult to test for and locate, as its condition varies with atmospheric changes or other causes that may affect the moisture which may exist on any insulating material.

When due to dampness, this leak is the result of a combined electro-chemical action, which we know is attended with more or less heat.

The process of electro-chemical decomposition may be more correctly termed electrolysis. Unless interrupted, its ultimate end is to destroy the insulating properties of substances that are in contact.

A case in point is that of the charring of wood moulding, directly the result of dampness, in which there is a surface-conduction of current. This will eventually change the wood into a more combustible substance—charcoal. Being a comparatively good conductor of electricity, the current flowing may be sufficient to heat and ignite the charcoal, or it may be ignited by an arc.

This electrolytic action affects metallic substances wherever encountered. In many cases the so-called verdigris, a direct result of electrolysis, covers switchboards, switch-bases, and cut-outs, rendering this otherwise insulating-surface a conductor of electricity, further increasing the action and heating the affected parts. Sufficient

heat may and has been developed to rupture the insulating base, consisting as it may of either slate, porcelain, or marble, and permitting the actual contact of the switch-blades or fuse-lugs resulting in a short-circuit.

Electrolysis acting upon conductors will eventually reduce the cross-section of the conductor to such a small area that it is no longer safe to carry the normal current. In some cities considerable damage has resulted from underground electrolytic action, namely, the decomposition of water and gas pipe lead-armor of telephone and telegraph cables.

Probably the most favorable condition for electrolytic action in connection with interior wires is that in which two wires of opposite polarity are incased in wood moulding, each wire being properly located in its own groove and the moulding properly capped. By means of a mop or broom the moulding near the washboard is sprayed with washing-water which is more or less impregnated with alkalis. The surface of this moulding then becomes an excellent conductor of electricity, and the result is that which I have already explained.

In another instance electrolytic action set in between conductors incased in an iron conduit (unlined) and was carried to such an extent that the insulation broke down, causing a short-circuit, welding the conductors and puncturing the conduit.

Grounding will eventually produce the same condition of affairs. By grounding is meant that there is an electrical connection between a conductor and the earth, or between the conductor and some conducting-material that may be partially insulated from the earth. In either case, intended or not, there is a difference of potential between the insulated conductor and the earth, or between the partially insulated material and the earth. The accidental grounding of the other side of the circuit will produce a leak or short-circuit, inviting an undesirable condition.

In one instance, a frame house, supplied with gas, was wired and connected for the supply of electric-current. A flexible drop-cord was hung in front of a bureau between two windows. A gas-bracket was located beside one window, the pipes to supply the brackets being run under the window, but inside the framework, a joint in the pipe being made directly under the window. A fire occurred and an examination justified the following conclusions: The flexible cord had been hung over the gas-bracket; the handling of both the cord and the bracket had resulted in the removal of some of the insulation of the cord, thus making an electrical connection between the gas-pipe and the bare wire; the current was carried to the gas-pipe joint; the contact, being electrically poor, created an arc, punctured the pipe, and ignited the gas. Another example is a case of a poorly grounded conduit-system in which either positive or negative wires become grounded to the iron conduit, and in which event the conduit becomes of the same polarity as the grounded wire, and there will then be a difference of potential between the grounded pipe and the earth, or the other polarity of the system, ever ready to close the circuit, creating a cross or short circuit. The same condition is possible in metal-ceiling construction.

On very large systems, as, for example, a three-wire underground system, supplying current over a large district, it is impossible to maintain a perfect freedom from grounds, the leakage to earth being through the insulation and the tubes, the service, junction and feeder boxes. On such a system it is practically impossible to make use of a ground-detector, on account of this leak being general. Such a ground or leak practically connects every underground pipe-service to this system.

In connection with the supply of current to combination gas and electric fixtures, where it becomes necessary to attach the wires to the gas-pipes, it would be dangerous, if not disastrous, if the insulation should break down, piercing the gas-pipe and igniting the escaping gas. It may be well to note here that trolley-systems have a ground-return and maintain a difference of potential of about 550 volts between the trolley-wire and the rail.

The high-tension series arc-light system, whether underground or overhead, furnishing a constant current of 9.75 amperes, the potential of which may vary from 500 to 6,500 volts, is a source of danger, for, in the event of two grounds, the arc produced may be a powerful one and, should a break occur in the line, an intense and a long arc may be obtained at that point.

If the primary and secondary coils of a transformer come into contact electrically, the high-voltage primary current would flow to the secondary system, which is entirely unsuited to such high pressure.

There is still another hazard in connection with overhead lines, that of discarded wires. These wires, no longer in service, but retained in order to maintain the right of way, cross and lie upon roofs of buildings or hang in an unsafe condition from a structure, and in some cases, such as telephone, telegraph and call wires, are actually connected to gas and water pipes in tenanted or unoccupied buildings. The other ends of these discarded wires may be hanging promiscuously and, possibly, due to corrosion or rusting of the wire or its holdings, fall and cross wires carrying current at a high or low voltage. In consequence, the current is carried through the discarded wires to ground, whether it be gas or water pipes, metal roofs, cornices, or awnings, and may be sufficient to melt the wire or cause an arc at some comparatively high-resistance point, creating a most favorable condition for serious trouble.

The third cause is that in which an inflammable material is permitted to come into contact with parts of a circuit that have become

heated. This cause may be divided into two classes: that in which insulation is the material, and that in which a material exists, but adds nothing to the benefit of the circuit. It is obvious that there is no necessity for these distinctions, for the result is ultimately the same and will be treated as such.

In the manufacture and distribution of electrical energy there is a loss by heating due to the fact that all substances have a resistance which has to be overcome and which represents a loss in energy, which is substantially all transformed into heat. The heat which is produced in a wire only depends on the number of watts expended electrically by the current in overcoming the resistance of the wire, which resistance varies with different materials, and goes to raising the temperature of the conductor and indirectly that of the surrounding bodies; and this rise continues until the rate at which heat is lost equals that at which it is generated; then the temperature becomes constant. It is obvious, therefore, that an electrical-conductor is only capable of carrying a certain current with a given elevation of temperature, and, practically, the allowable temperature is limited by consideration of injury to insulation and the danger of fire.

The temperature elevation of a wire for a given current strength depends upon its resistance, diameter, covering, and its surroundings. A copper wire carefully insulated by a thin coating of waterproof material and placed in still water is usually kept comparatively cool, owing to the rapid conduction of heat through the insulated cover into the water.

The same wire, carrying the same current, but suspended in air instead of being immersed in water, will usually attain a considerably higher temperature, as still air does not carry away heat from the surface of the wire so effectively as still water. For the same reason a wire buried in the ground will, in almost all cases, be found to be cooler than where supported in the air. A covering of, say, cotton, rubber, or other electrical non-conductor, will, up to a certain thickness, serve to cool the wire by increasing its surface.

The same heating conditions would apply to switches, switch or fuse lugs, bus-bars, commutators, and in fact to any current-carrying parts of a circuit, and it is therefore necessary that they be sufficiently heavy to carry the required current without undue heating.

Heating may be the result of insufficient contact-surface, and the tendency in all cases is to increase the temperature to a dangerous point, or to melt and ignite the insulation of an inflammable nature, such as rubber and cotton. It is necessary, therefore, that the carrying-capacity of current-carrying parts and of contacts shall be limited.

Poor connections at fuse-blocks may produce heat enough to cause the fuses to melt when there is really no trouble elsewhere on the circuit. This may occur when the fuse-blocks have too little contact-surface at the connection-points to properly carry the current, or when the contact-surface is not secure, in which case arcing occurs, pitting the surface and intensifying poor contact.

The formation of an arc may be understood by the following explanation: The two conducting terminals under ordinary circumstances are brought together before being separated to establish the arc. As soon as this separation commences, the spark which tends to form at any break in a closed circuit vaporizes a portion of the materials of the electrodes, thus establishing a bridge of conducting vapor through which the current flow is maintained. The concentration of energy in a small space produces an intense heat, which vaporizes the electrodes more rapidly. The temperature of this arc, although difficult to determine accurately, is about 3,500 degrees Centigrade. We may obtain an approximate idea of this heat when we consider that about 500 degrees Centigrade are necessary to make solid bodies glow with light, and that the melting-point of platinum is 1,775 degrees Centigrade.

As was noted previously, the presence of two leaks on an electrical circuit, creating an electrolytic action and finally a break in the circuit, is attended with the destructive arc. It is equally true that the breaking of any circuit, whether it be by means of a properly proportioned switch, the melting of a fuse, or the breaking of a current-carrying wire, is attended with this arc. Where the numerous blowings of fuses have occurred, the porcelain surface of the fuse-block is often covered with a layer of metallic substance, which becomes a partial conductor. Upon the repetition of this blowing, an arc is formed and maintained by this metallic layer; in many cases the porcelain cover is fused and broken.

In other cases, particularly with slate switch and distributing boards, the melting and resulting arcing have been known to crack the insulating substance and the various conductors to be short-circuited. In other cases the short-circuiting of an incandescent-lamp has destroyed the sockets or controlling-devices beyond repair. The throwing out of sparks from arc-lamps and the dropping of hot carbons have been known to cause fire. Sparks from the commutator of motors, from the short-circuiting of flexible cords and of fixture-wires, from the short-circuiting of cables in conduits and in manholes, igniting accumulated gases; from short-circuits in sockets, attachment-plugs, receptacles, switches, and various other devices have been known to cause fire.

Overheating of wires, of motors, dynamos and switchboards from overload; overheating of starting-boxes; overheating of theatre-dimmers and regulating boxes from overload; overheating of improperly made joints, which may be considered the weakest part of an installation, and may include joints between wires, between wires and lugs, between lugs and bus-bars, or between switch blades and

clips; overheating of magnet coils or resistances of arc-lamps, and innumerable other similar defects have been known to create a fire.

Other sources of fire may be the contact of an incandescent-lamp with inflammable material, such as cotton, paper, wood, celluloid goods, etc.; the melting of fuses, the breaking down of insulation, sparking from electrolysis, or short-circuits in places impregnated with inflammable gases, such as benzine, naphtha, ether, hydrogen, gasoline and many others of explosive nature; also in any class of manufacture where vegetable material is distributed through the atmosphere in the form of dust, extra precautions are absolutely necessary, the least flash or arc being sufficient to cause an explosion. While the electric-light is the safest light in places of this character, the wires should be placed in iron conduits, there should be a vapor-proof globe over the lamp, and cut-out and switch should be located at a safe distance.

Candy-factories, sugar-refineries, flour-mills, breweries, saw-mills and others of like hazardous nature may be considered in this category; also textile mills, where there is an accumulation of the particles of stock that is carded out, which particles, owing to their extreme lightness, fill the air in the room and, settling, completely cover everything with an inflammable material usually known as "fly," which is a fine dust of vegetable matter. In this condition the dust may be ignited by the blowing of a fuse or similar accident.

It has been contended that electric-light stations burn more rapidly than buildings of the same construction, but used for other purposes, and it has been supposed by some that this is due to the saturation of the walls, floors and its entire structure with electricity. The atmosphere in central stations supplying light or power is impregnated with ozone, the result of electrostatic discharge from belts and sparking brushes, and intensified by the more favorable conditions of heat and dryness necessary to the proper operation of a station. That ozone adds to the heat and rapidity of a fire once started is evident and is a subject for further investigation.

It is quite apparent that the same state may be created in manufacturing establishments where favorable conditions exist.

Static electricity has been justly considered as a cause of fire. Combustible gases and vegetable dust may become ignited by the spark resulting from the static discharge from belts.

Electrical excitement manifested by sparks and shocks is so common in manufacturing institutions as to cause no comment. In explosions that have occurred in breweries, dyeing establishments, oil-cloth works, printing-offices, chemical-works, distilleries, flour-mills, and manufactories of similar character, the cause has been traced to electric sparking or the friction from static electricity.

It will be noted from the remarks made in this paper that electricity is treated as a source of heat and as such is classed as a fire-hazard, and it is fair to say that it presents to us a most dangerous and powerful factor in that respect if permitted to be neglected.

That the situation is not worse is due primarily to the fire-underwriters, who early realized the importance of restricting indiscriminate methods of construction, in order that the greatest possible immunity from fires may be secured.

With these facts in mind the National Electric Code was compiled and published by the American Institute of Architects, American Institute of Electric Engineers, American Society of Mechanical Engineers, American Street Railway Association, Factory Mutual Fire Insurance Companies, National Association of Fire Engineers, National Board of Fire Underwriters, National Electric Light Association, and the Underwriters' National Electric Association, a compilation most worthy of the honorable and learned bodies referred to. It provides for almost all emergencies, yet circumstances may and do arise where, from a possible misinterpretation of the unusual conditions present, the code does not seem to apply.

In applying the code it is very evident that care must be taken in the proper discrimination of the hazard and to apply that electrical system which will be least apt to enhance the hazard.

A system which would be comparatively safe to introduce in a department-store would fail and break down in breweries, dye-houses, bath-houses and places of similar character, due to dampness; and in chemical-works, starch and sugar works, textile-mills, paper-mills, gunpowder-works, fur-tanneries, coal-mines and flour-mills, due to danger of ignition or explosion of the dust by electrical sparking.

Extra precautions should be taken in regard to the use of rubber-covered wire in warm rooms, such as engine and boiler rooms, hot rooms in bath-houses, and in drying-rooms. The same precaution should be taken in regard to the use of any wire, other than rubber-covered, in damp places. Thus, it will be seen that, as conditions vary, one quality of insulation would be advisable in one location and would be absolutely unsatisfactory in another location.

Generators, motors, switchboards, resistance-boxes and equalizers would be unsafely placed if located in damp rooms. Transformers would be dangerously placed if inside buildings where the oil or smoke from the burning-out of the coils or the boiling over of the oil could do harm.

It may be correctly judged that, in the installing of electric-wires supplying incandescent or arc lamps, motors, heaters, or other apparatus, extreme care must be taken to avoid, wherever possible, gas-pipes, water-pipes, the space under the bath-rooms and water-tanks, and general metallic construction, including metal awnings, metal ceilings, iron beams, cornices, awning-frames and signs.

The introducing of various auxiliary devices for varying the candle-power of lamps, lamps in series with bell and telephone systems, and connected to lighting-systems, and other similar makeshifts, are in the

wrong direction, increasing the fire-hazards, not necessarily because of faulty constructions, but because their constant manipulation is in the hands of those less informed or absolutely ignorant of the danger involved. The dangers of poor joints have been discussed, and I can but suggest a remedy, and that is, the only precaution against poor joints lies in the prevention of them.

The secret of long-distance transmission lies in the successful employment of very high voltages, and, regardless of the character of the current employed, the difficulties of insulation confront us. It is important that the line as a whole must be insulated against direct earth connection or short-circuit in underground service, and grounds or short-circuits if the line is an aerial one.

The quality of insulators is another important consideration, owing to surface-leakage or puncture. Surface-leakage is more to be feared, as it can never be depended upon, being a function of moisture from rain, wet snow, or fog and drifting dust, which is difficult, if not impossible, to provide against, and which varies with the location.

High-potential circuits are also objectionable in any location where telephone, telegraph, signal-systems, and similar circuits are in proximity to them.

Extra attention must be given to an insulation supplied by secondary alternating-currents, in order to reduce the hazard and provide for any defects that may result from the breaking down of insulation of primary wires.

Overhead wires should be protected by lightning-arresters, the proper distribution of which depends on local conditions.

The more frequent and intense the storms may be in any location, the more lightning-arresters should be used. It is important that thoroughly good earth connections shall be obtained and that the wire shall not be subjected to mechanical injury.

In order that lightning-arresters shall be most effective, the wires leading to the earth should be as straight as possible, avoiding kinks or sharp bends. The best prevention of trouble from dead overhead wires, and the danger from their crossing with telephone, telegraph, or call-systems, electric-light and power wires, would be their removal.

Trolley-systems should be protected by guard-wires the entire length of the trolley-circuit.

The construction of temporary work for display decorations or general lighting, regardless of the length of time it may be used, should be the same as for permanent work. Invariably this kind of construction is rushed in a haphazard way, and, combined with the usual attending flimsy and inflammable decorations, presents a condition not desirable, many times quite dangerous.

The great problem is how to secure safety, and this may be answered: By the proper methods of construction, using only high-grade material.

Evidences of the lack of knowledge on electrical subjects are quite apparent: nails and screws driven into electric-light moulding, wires in contact with foreign metallic objects, fuses uncovered so that molten metal may fly about among inflammable material, and conductors so overloaded as to be perceptibly hot.

The fire-hazard should be always carefully considered in an electrical installation. A system of electric-wiring may be ideal from an engineering point-of-view, and yet as a fire-hazard would be most dangerous.

While the operation of electrical-apparatus is burdened with many dangers under some conditions, the reverse may be said when the equipment is installed by skilled wiremen guided by experienced engineers and the National Electric Code carefully applied; and it is essential, when alterations or repairs are necessary, that, as a continual safeguard, due notifications be given to the local Board of Fire Underwriters. Under these conditions electricity is as safe as any source of power and the safest source of light known to mankind.

DISCUSSION.

JOSEPH D. ISRAEL: I would like to ask Mr. Devereux how the number of fires from electric-wires compared with fires from other sources.

MR. DEVEREUX: Quite favorably. I had expected to be asked that question, so I came prepared: 1896, fifty-five electric-fires; 1897, fifty; 1898, forty-six; 1899, seventy-six (thirteen due to trolley-wires on street); 1901, eighty-nine (thirty-four due to trolley-wires on street).

L. F. RONDINELLA: In what territory?

MR. DEVEREUX: Philadelphia. There are about 16,000 insured buildings that are wired.

MR. ISRAEL: In your notation of electric-wires, do you include everything, trolley, telephone and telegraph?

MR. DEVEREUX: Yes, everything. In the majority of those cases it was due to overhead wires, current jumping over lightning-arresters and other safety-devices.

CARL HERING: It seems to me that we ought to take into consideration, in connection with these statistics, that although the number of fires has remained about the same annually (approximately

fifty-five), yet the number of electric installations has increased very greatly; so that although the actual number has not diminished much, yet the relative number has diminished greatly.

MR. DEVEREUX: That is right. Of course, the type of work is increasing very much. Had we as many buildings wired, say twenty years ago, as we have now, there would have been a great many more fires. In those days we used wooden cut-outs, etc. Of course, all that class of material has disappeared. There are a great many places in which electric-light is now used where it would be impossible to use any other method of illumination.

THE PREVENTION OF LOSS BY FIRE, AN APPLIED SCIENCE.¹—II.

YEAR by year for twenty years the test went on, until all the senior risks are now protected by sprinklers and we are carrying the protection throughout the storehouses. I had to work first by persuading, next by coaxing, next by manipulating the rates of premium, next by conditioning renewals and, finally, by refusing to insure any unsprinkled factory or works. The rule to which I have been brought and which I would practise in any textile-factory, machine-shop, foundry or works under my own charge, or in any big warehouse or department-store, is, "Wherever a sprinkler can be put, put one; especially in the place where you are sure no fire can occur, because that is where you will get caught, if you do not put a sprinkler right there." We insure against water damage from the breakage or leakage of sprinklers. Our younger associates and special experts bred to the science of prevention of loss are now numerous, and will be prepared to take up the full responsibility when we elders retire or are retired. As I have had seventy-five attacks of chronic *astoritis*, that cannot be long distant.

In addition to this work of prevention, we have standardized mill-construction, storehouse-construction and workshop-construction. We have general plans of each that will serve the purpose of any member or prospective member in deciding upon the general features of his proposed building. They are given in such detail that any competent engineer may adapt the special plans of any works to these general rules, and they usually save our clients a great deal of money. I do not name architects, because, I regret to say, that, while many years ago there was no architect known to us to whom the construction of a factory could be safely left, lest, in the effort to build a work of art or to give an æsthetic appearance, he should wholly lose sight of the purpose of the building, as well as of its safety, there are even yet but very few of the architects who can subordinate their idea of the fine-art of architecture to the necessary use and purpose of the building. Professional architects are, therefore, seldom charged with the whole construction of factory or workshop, although sometimes consulted on the elevation and exterior decorations. I regret this division of function between the architect and the engineer, because, while there is a great deal of scope for true art and for æsthetic effect in the construction of the factory or workshop, they are now, as a rule, very dreary and often very unsightly buildings. In these late days, the profession of architect has become almost impossible without combining the function of the engineer. I have great hopes from the union in the future in improving the architectural effect of our great industrial buildings.

One of the most unpleasant parts, in fact, the only unpleasant part, of my profession for the last twenty years has been in witnessing the awful blunders and malpractices in the construction of city buildings and of works which were not under our supervision, such as hospitals, asylums, ostensibly brick and stone churches (which are mostly shams screening a very combustible wood structure within), schoolhouses and city buildings alike. Twelve years since there was hardly a building in Boston which, had it been removed to the middle of a ten-acre lot free of neighborhood hazard of the construction and protection as I found them, would have been insurable at any price in a factory mutual company. There are now a few which, if separated from neighborhood hazard, might be so insurable, but not very many even yet. Some of the fireproof skyscrapers would be wholly inadmissible.

We do not regard the horizontal hazard as of any great moment. We regard the vertical hazard as much more important. We have often one acre, sometimes two to four acres on a floor. No fire has ever passed in a destructive way from one room to another in the working departments of a slow-burning factory through a plank and board mill floor. Such fires as have passed have either gone by way of belt-holes, stairways or elevator-shafts. On the other hand, give regard to even so-called fireproof buildings. What do we witness? Open stairways, open elevators, ducts of all kinds from cellar to attic, as if the motives of the architect had been to give the most complete provision for the fire to pass upwards without check; yet more, in the ordinary construction not called fireproof, hollow walls, hollow spaces, bad roofs, dark cellars and basements, every provision for fire to pass free of danger from water. . . .

Suppose the \$150,000,000 ash-heap could be reduced to \$15,000,000; would there not be a profit of \$135,000,000? In this as in all other industrial arts the profit of one generation consists in the saving of what the previous generation wasted. How shall we save this disgraceful loss by fire? The work of the mutual underwriters in their

¹ A paper by Mr. Edward Atkinson read at the Convention of the International Association of Fire Engineers, New York, September, 1902. Continued from No. 1418, page 71.

restricted field is ended. So far as slow-burning construction of timber, plank and brick is concerned, our work is substantially done; but, as timber is becoming scarcer and dearer, it has become necessary for us to study the problem of what is called fireproof construction on self-supporting steel framework. As this problem involves questions of which the very A B C are yet unknown, . . . we will put up buildings for an insurance experiment-station, for which we have a grant of land from one of our railway-companies. In this experiment-station we will make all the tests called for, and we shall be enabled to block out a complete course of instruction in insurance-engineering, I hope, within a year. The plant and the experience derived in its use will then be transferred to the Massachusetts Institute of Technology. . . . Prof. Chas. N. Norton will be the executive head. . . . My conception of this course of construction is, that it will be necessary for every architect and every student of civil or mechanical, electric or chemical engineering to take it as a condition of obtaining a full degree. Also, that special courses of one or two years shall be provided for men occupied in the conduct of insurance-companies, and, yet more important, for candidates for positions as chief or district fire-engineers. And this leads me to my final conception of what your position and authority as fire-engineers should be. It may be made one of the most important branches in the application of science to the prevention of loss by fire. It will raise the profession to one of the most useful and most profitable to the community, which will, of course, entitle its members to remuneration by the measure of its service. . . . You are now obliged to cope with fires at the hazard of life and limb which you have long anticipated. You must incur dangers which you know are remediable, which are due in about even measure to the ignorance, stupidity, carelessness, or criminal negligence of owners, architects, builders and occupants alike. Yet your lips are sealed, if your rules are like those of Boston. You can make no report, you can exert no authority and, if you meddle, you might be told to "mind your d—d business." Isn't this true? What is the remedy? Is it not to elevate the profession and to give fire-commissioners and fire-engineers coordinate authority with building-departments and inspectors and superintendents of buildings by so extending the inspections which you now make for your own safety, and giving you authority to correct evils so as to remedy defects and dangers for the public safety? . . . More than twenty years since I made the acquaintance of the district fire-engineer in the district where my office is. He pointed out to me buildings of extreme peril, in the protection of which he might risk his life, where the hazard was subject to simple remedy, but about which he himself could do nothing. His functions were limited to putting out fires; he could do nothing to prevent them from becoming dangerous. I made an arrangement with the editor of the *Boston Herald* to put bad cases on trial by newspaper. In some cases we succeeded. In one case we failed and I was threatened with a suit for damages by the architect for injury to his reputation. He didn't sue when his counsel heard my case; but seven years later this very danger that I pointed out ensued, and from that building spread the second largest conflagration to which Boston has ever been subjected. . . .

I am informed that you have been considering the conflagration-hazard, and how to cope with it. We are subjected to a serious conflagration-hazard in Lowell, Lawrence, Manchester and other great factory cities. Miles of large mills are on the canals close together in mill-yards, sometimes in rows of three, thirty, forty, fifty, sixty, sometimes 100 feet apart; sometimes four, five and six stories high, and filled with cotton spread in thin sheets almost explosive. Yet, this proximity has been an element of safety, not of danger. Our losses in all risks, including these cities, have averaged fifteen cents per year on each hundred dollars for fifty years. The losses in these great factory cities where the conflagration-hazard exists have been less than ten cents. The reason is plain: Their pumps and pipes are all connected. They all have two separate and ample courses of water-supply. They have standpipes and hydrants upon the roofs at all dangerous points. When a fire occurs, a greater volume of water can be poured upon or into each single building than could be concentrated by any existing city fire-department from movable fire-engines, or from hose carried up upon ladders.

Boston, New York, Philadelphia, in fact, all the great cities could be protected from conflagration in the same way. For instance, what could be more simple than the full protection of the congested business districts of New York and Philadelphia? Are there not rivers of water within easy reach on both sides? Are there not great volumes of water a little below the surface that can be easily reached? Can you not imagine a fire-service with pumps, pipes and hydrants such as we have in all our great mill-yards and factory cities? Could not powerful pumping-engines be placed at the water-side; large reservoirs and stationary steam fire-pumps in the square or at other convenient points serving standpipes and roof-hydrants at all vantage-points ready for instant service without the delay and danger of raising ladders and carrying up long lines of hose? Could not such a separate fire-service be established at a tithe of the enormous costs now called for in providing city water from Ramapo or elsewhere? Many years ago I made a computation of the cost of protecting a hundred acres of the dry-goods district of Boston in a way that would make a great conflagration practically impossible. It could then have been done at a cost not exceeding \$7,000 per acre. It could be done more effectually and at less cost to-day. I do not speak without the proof of experience. The great conflagration in Paterson came down before a gale of wind upon a group of silk-mills

upon which we had millions of dollars at risk. The city departments could give them no aid, but the mill departments were ready. They ran out long lines of hose to meet the fire, and they stopped it. A part of their pumps were put into use; others were kept in reserve lest there should be a break. For seven hours their pumps were in constant operation, yet such was the excellent quality of their underwriter hose that not one section burst. The conflagration was checked, the mills were saved; and our loss was nominal. This is but one of several examples of great and dangerous fires stopped by apparatus put in under our supervision. In our whole fifty years of experience there have been but five instances where a fire has passed from one mutual risk to another separated risk with any considerable loss in the second mill. These cases could not recur again.

One other point, and I have done. In the early days before we had made a science of the prevention of loss there were several bad fires in which many operatives lost their lives. Since we began our present methods I think there has not been a single loss of life of any operative which could be attributed to a fire in any of our insured works. . . .

I am prepared to answer any questions upon slow-burning construction, or in factories of that type. In order to be able to answer all questions that may hereafter be put to me on what is called fireproof building, fireproof wood, fireproof paint and other types of what are believed to be incombustible materials, we have established our experiment-station in insurance-engineering and we shall soon be ready for you or any one else to put questions to us or to submit any material to be tested.



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

HOUSE OF EZRA R. THAYER, ESQ., NO. 77 BAY STATE ROAD, BOSTON, MASS. MESSRS. PETERS & RICE, ARCHITECTS, BOSTON, MASS.

"THE MARION" APARTMENTS, WASHINGTON ST., NEWTON, MASS. MESSRS. GAY & PROCTOR, ARCHITECTS, BOSTON, MASS.

DESIGN FOR A CITY HOUSE. MR. E. G. W. DIETRICH, ARCHITECT, NEW YORK, N. Y.

Additional Illustrations in the International Edition.

LES SAINTES MARIES.

See article on the "Fortress Churches" elsewhere in this issue.

THE STEENROTSE HOUSE, MIDDELBURG, HOLLAND.

THE POMPEIIAN ROOM: CONGRESS APARTMENT BUILDING, CHICAGO, ILL. MESSRS. HOLABIRD & ROCHE, ARCHITECTS.

THE POMPEIIAN ROOM AND FOUNTAIN: CONGRESS APARTMENT BUILDING, CHICAGO, ILL. MESSRS. HOLABIRD & ROCHE, ARCHITECTS.

THE ENGLISH DINING-ROOM: CONGRESS APARTMENT BUILDING, CHICAGO, ILL. MESSRS. HOLABIRD & ROCHE, ARCHITECTS.

THE FRENCH DINING-ROOM: CONGRESS APARTMENT BUILDING, CHICAGO, ILL. MESSRS. HOLABIRD & ROCHE, ARCHITECTS.



ELECTRIC MAGNETS. — One of the greatest spheres of usefulness of the electric lifting-magnet, now in use in steel-works in Cleveland and Chicago, according to the *Electrical Review*, is its application to moving and handling bulky material of such size and shape as to render difficult its transportation by any other method. Thus, in rolling-mills a combination of magnets will easily handle a steel plate 42 feet long, 8 feet wide, and $\frac{1}{2}$ inch thick, and will do it at a time when the plate is so hot that it could be handled only with difficulty and danger were it necessary for workmen to adjust chains with which to lift it. Each electric magnet displaces a gang of from six to twelve laborers, inasmuch as one operative can manipulate a magnet, or two or three if they are employed in the same operation. The mode of operation is simple. The magnets are lowered until contact is made with the plate or other piece of material to be handled, and after the current is turned on the load is hoisted and moved by means of the crane or conveyors to any part of the shop or yard. Electro-magnets, as now in use, differ considerably in design, but the most popular form is a simple horseshoe, with one limb so developed as to form an envelope for the rest of the

magnet. This type has, however, proved inadequate for certain grades of work, notably plate handling, on account of the shape of the pole-face and the excessive leakage from pole to pole. In the experiments made to devise the most efficient form of magnet many surprising disclosures were made. For instance, it was demonstrated that a round magnet which would on a straight pull easily lift five tons was incapable of picking up a long thin plate weighing only half a ton. After thorough investigation, most engineers have adopted a group of rectangular poles as the best for plate handling, which, as previously intimated, constitutes the most important use to which the lifting-magnets have yet been put. One of the most interesting qualities of the electromagnet is found in its capability, under regulation of the strength of the magnet, to pick up several objects or only one. This may be accomplished by means of a rheostat in series with the winding, but the preferable method is for the operator to drop off superfluous material by opening the switch and suddenly closing it. The current consumption of a lifting-magnet is dependent, of course, upon the winding of the coils, but, as a rule, a magnet operated on 1,000 watts will have a capacity for handling fully 3,000 pounds of sheared plates under any and all conditions and may, under exceptional circumstances, handle loads up to five tons. In many of the horseshoe type of electro-magnets, horns are provided at the sides for attaching sling-chains in case of the disablement of the magnet. As indicating the capabilities of even the less perfect magnets, it may be cited that at a recent test a magnet of the modified horseshoe design, whose large size naturally entailed a low ratio of lifting-power to weight, lifted a load in excess of twelve tons with thirteen amperes at 250 volts or 3,250 watts. The weight of this magnet is 1,235 pounds, which renders the ratio of weights in the case of the test in question about nineteen. Tests of a representative bi-polar magnet in use at the plant of the Illinois Steel Company, the magnet weighing 1,200 pounds, demonstrated its capability of lifting six tons with six and one-quarter amperes at 250 volts, or 1,562 watts. This magnet is capable of picking up several plates at a time. Tests such as those above outlined are not, however, of much value as criteria of the practical working efficiency of magnets, as may be surmised from the fact that the round magnet which at the test showed a ratio of nineteen is not, under actual working conditions, anything nearly as satisfactory as the long magnet, the ratio of which in this particular test was but ten. As affording further comparison it may be noted that the coil of the round magnet involves 2,904 turns of wire, weighing approximately 217 pounds, whereas the two coils of the long magnet embody 2,952 turns and weigh 176 pounds. At the Illinois Steel Company at the present time the favorite type of magnet is a pole-piece of 5 inches cross-section, and $3\frac{1}{2}$ inches length, with the coils surrounded to a depth of fully $\frac{1}{2}$ of an inch. The magnet-face is rectangular in form. The weight of this magnet is but 300 pounds, and in a test corresponding to that to which the bi-polar magnet previously mentioned was subjected, four tons, indicated a ratio of twenty-seven. This magnet can be operated with four amperes at 230 volts or 920 watts, but usually takes four and four-tenths amperes at 250 volts or 1,100 watts.

DIVERS LONDONS. — The area of London is of a varying character, since it depends upon the classification by the different governing bodies. The London Manual for 1903 says the name "London" was formerly applied only to the City, an area a little over one square mile, and the outside districts grew up without any homogeneity and without a common name until 1855, when they became officially known as the Metropolis. This area became in 1889 the administrative County of London, 118 square miles in extent, and as such includes the City, Greater London, or the Metropolis, under the Metropolitan and City Police, includes the whole of the counties of London and Middlesex, and part of the counties of Kent, Surrey, Essex, and Herts. It is 693 square miles in extent, and contains a population of 6,581,372. The Metropolitan water-area is 620 square miles in extent and comes nearest to Greater London in point of size. Northward it stretches as far as Hertford, twenty miles away, while in the northwest it contracts to the county boundary at Hampstead. The Metropolis, for criminal jurisdiction — the district of the Central Criminal Court — is not identical with the police-area; it contains an area of 420 square miles, and a population of 5,300,000. Post-office London has its own limits, which may be curtailed or extended by the Postmaster-General. — *St. James's Gazette*.

ROME FOUNDED BY ETRUSCANS. — It is said that the excavations which Professor Airolì is making in the Forum have conclusively proved that the city existed long before the epoch to which Romulus is assigned. It is contended that Professor Airolì's explorations have shown that Etruscans originally established themselves on the Aventine, from which they constantly descended and fought the Sabines, who inhabited the low ground at the foot of the hill. This Etruscan city was Rome. The discovery of a great number of skulls forms part of the evidence. Under Romulus, who, instead of giving his name to the city, took his name from it, the Romans gained victories over the Sabines. Peace was concluded and commemorated by building the Via Sacra which linked the districts inhabited by the Romans and the Sabines. The excavations have revealed the Via Sacra as it existed two thousand years ago. Owing to the excavations it is now flooded by the Tiber whenever the river rises, exactly as in the remote past. When Etruscan Rome occupied the Aventine a marshy lake covered the site of the Forum, and as late as the time of the Imperial Rome there was an artificial lake in the Forum in front of the Rostra. The bed of the lake has been found to be still water-tight. — *Boston Transcript*.

STATUES OF WILLIAM I. — Up-to-date 318 statues of William I of Germany have been erected in German towns at a total cost of about \$1,000,000. — *N. Y. Evening Post*.

THE HORSE-POWER OF ITALIAN WATERFALLS. — Professor Nitti, of the University of Naples, estimates that the waterfalls of Italy are capable of producing electricity equal to 5,000,000 horse-power. In the convenient distribution of this power Italy has an advantage over Hungary, Sweden, and even Switzerland. — *Exchange*.

THE TEMPLE OF HERA, ISLAND OF SAMOS, REDISCOVERED. — The ancient Temple of Juno in the Island of Samos, which Herodotus described as one of the glories of the pre-Christian world, has just been discovered by the Archaeological Society of Greece, after being quite lost for many centuries. A correspondent of the *Yorkshire Observer* states that the portions of the temple so far brought to light include the altar, the bases of the twenty-nine columns, many inscriptions and lesser objects. Work is being actively prosecuted, and it is hoped that the whole of the ruin will be laid bare for the study of the learned in architecture.

A BLACK-WALNUT BRIDGE. — The old black-walnut bridge, which spans Pine Creek, in Warren County, built so long ago that no one seems to know when it was erected, is doubtless the most valuable wooden bridge in Indiana, says a despatch to the *Indianapolis News*. It was built at least fifty years ago by the County Commissioners when black-walnut timber was common in the section. It is between 150 and 200 feet long and the timber in it is worth from \$12,000 to \$15,000. Lumbermen and bridge-companies have several times tried to get possession of the structure. The bridge-companies have offered to replace it with an iron or steel bridge, taking the walnut lumber as pay for the new bridge. The Commissioners think that on this basis the companies would have much the best of the deal, and they have declined to make the trade. — *Boston Transcript*.

THE BRITISH MUSEUM UNSURED. — It is startling to think that, while almost any tradesman's shop that might be burned down is covered by insurance, the British Museum, if it were burned down to-morrow, would not cost the insurance-companies one half-penny. Neither would the Houses of Parliament. They stand for three millions sterling, but not one single sovereign of this vast sum is covered by insurance. Three thousand pounds a year is spent on a force of police and firemen to protect the Houses of Parliament by day and night, and the British Museum pays the rent of a fireman's house in Coram Street, but that is the full cost of the precautions against fire in these places. The British Museum, believing that prevention is better than cure, has no artificial light in its innermost recesses. — *St. James's Gazette*.

INGENIOUS ENGLISH "LIFT." — Mr. Luke James Alderson Feak, accountant, aged fifty-four, of Kensington Park, Bayswater, died in St. Bartholomew's Hospital from injuries sustained in a revolving lift at 46 Queen Victoria Street, E. C., three months ago. The lift consists of several compartments open in front, moving slowly upward in succession on an endless chain, then over pulleys at the top and downward again. Passengers step into any one compartment as it comes to the level of a floor and step out again at the floor they want without the lift stopping. On October 15 Mr. Feak failed to step out at the fourth floor, and was carried round the top. As the compartment was descending again a friend, Mr. James Mason, pulled him out. His legs were jammed between the floor and the side of the lift. At the inquest the jury said that such lifts were decidedly dangerous. — *London Express*.

FRANCESCO BARTOLOZZI, R. A. — An extract from the *London Times* of November 4, 1892, relates to the departure of Bartolozzi, the engraver, from England. He was over-generous in disposing of his money, and in 1802 he was glad to accept the appointment of Superintendent of the Lisbon Academy. King George III then offered Bartolozzi a pension, but it was too late, for he had left on November 3. The *Times* said: "This celebrated engraver left our metropolis yesterday morning in order to proceed to Portugal. It is much to be regretted that an artist of such eminence, and whose talents have so long done honor to this country, should have been compelled in the decline of his life to have sought an asylum in any other — yet we have nothing with which to reproach ourselves on his account; the efforts of his genius have been rewarded with the liberality which uniformly distinguishes the English nation, and if imprudence has lavished what generosity has bestowed, it is a subject of regret that splendid talents should be unaccompanied by common prudence. The fact is, Mr. Bartolozzi has suffered himself to be too much imposed upon by his own countrymen, who have taken advantage of his easiness of temper and his carelessness with regard to his affairs. Thus, although he has acquired what might have been an independent fortune, he has neglected to preserve it; and to secure tranquillity and comfort to his latter days he has accepted the offer of the Government of Portugal, and has consented to pass the remainder of his days there, upon what in this country would be deemed a very moderate pension. We understand that a national academy of arts is to be established at Lisbon, of which Mr. Bartolozzi is to have the superintendence. He is to be attended by two pupils from this country. A handsome suite of apartments are to be assigned him, and everything else provided for him at Lisbon, independent of his salary, which is little more than £200 sterling a year. He purposes before his final departure to pass a few days at Bath. We cannot avoid observing that if the state of Mr. Bartolozzi's fortune is such as to require the aid of a patronizing Government, it would be a gratification to every Englishman that he should have been indebted for that assistance solely to the country of which he has so many years been the ornament. If, however, his departure is a matter of choice, we sincerely wish he may meet with encouragement equal to what he has experienced from the British nation." Bartolozzi remained in Lisbon until his death in 1815.

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THE NEW MAJESTIC.

BOSTON'S LATEST MODERN FIREPROOF
THEATRE.

WITH the new Majestic Theatre, located on Tremont Street, just south of Boylston, Boston has another monument to its already large list of architectural triumphs. Our illustrations this week will afford some conception of the beauty and harmony of design both of exterior and interior.

The theatre was built for the theatrical firm of Stair & Wilbur, and was opened to the public on the evening of the sixteenth of last month. These gentlemen now operate a chain of nearly one hundred amusement places extending from the Atlantic to the Pacific, and Mr. Charles H. Smith is the Resident Manager of the Majestic.

Mr. John Galen Howard, of New York, who is now engaged in the design and construction of the various buildings of the California University, and who obtained considerable celebrity as designer of the electrical tower at the Buffalo Fair, is the architect of the Majestic. The decorations were planned and executed by L. Haberstroh & Son, of this city, in conjunction with Mr. Howard, and this firm has deservedly gained a great deal of praise for the thoroughly artistic manner with which the work has been done. The Messrs. Haberstroh are also known in connection with the decorations at the Boston Theatre, the Hollis Street, the Colonial,

Boston Museum, Keith's, Steinert Hall, this city, and throughout the country in theatres and public halls; and more extensively still in the work they have done in private residences.

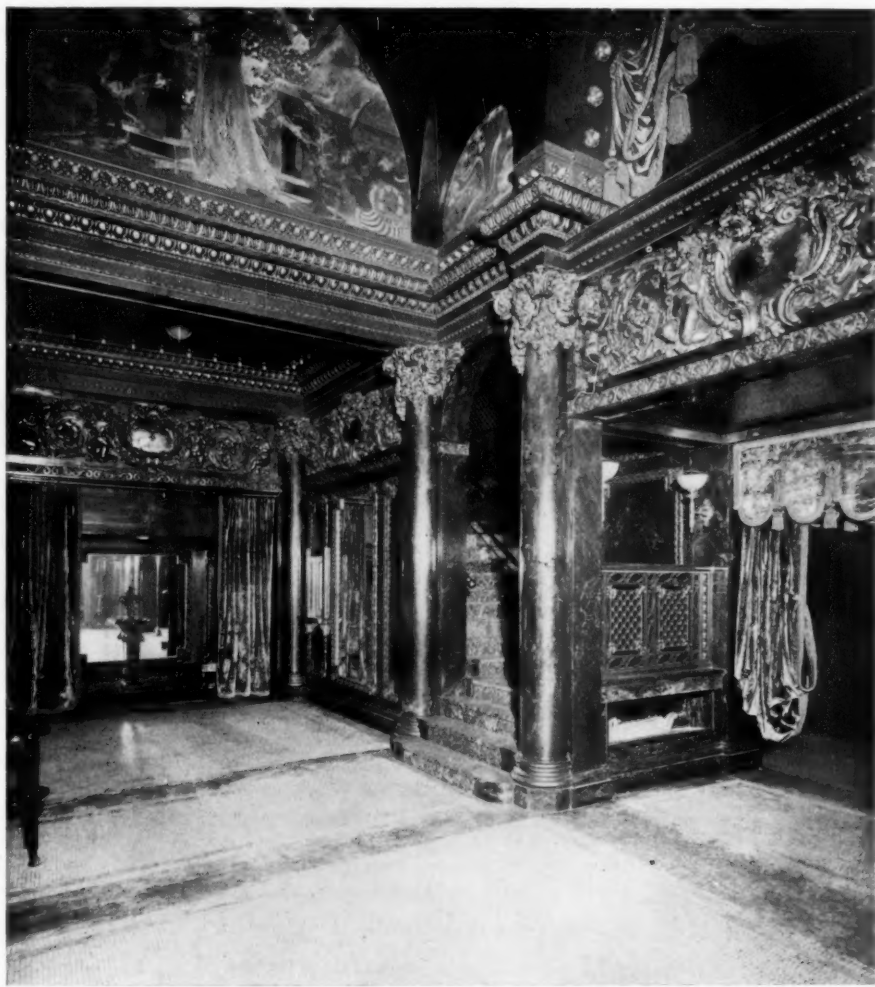
The Morrill & Whiton Construction Company, of the John Hancock Building, Boston, were the general contractors, under the immediate direction of their General Superintendent, Mr. Walter H. Haynes, and it is,

European building has been copied or adapted for this theatre. Not only is the plan of the interior original in every respect, but the vast amount of ornamental detail has been carefully designed and modelled under the personal supervision of the architect.

The monumental dignity of the façade excellently expresses the interior by the choice and disposition of the architectural motifs. The strong rusticated basement is

marked by three large arches giving access to the theatre, above which the large Ionic order extending through two stories expresses the auditorium.

Extending the entire width of the building is the foyer, with walls of highly-polished scagliola of a rich red color, strongly marked with veins of black and yellow. Engaged columns of the same material, with gilded capitals formed by the heads of satyrs whose horns make Ionic volutes and whose faces are half hidden by festoons of flowers, support a richly ornamented entablature, above which springs the barrel-vaulted ceiling solidly gilded. The variegated colors in this ceiling resemble the gold mosaics of a vault. At either end of this foyer are the handsome



The Entrance-Lobby: Majestic Theatre, Boston, Mass.

perhaps, only necessary to remark that this company has in this instance performed another of its thoroughly workmanlike contracts.

While the general style of the architecture may be called Louis XIV in character, it is greatly to Mr. Howard's credit that no

lunettes painted by Mr. W. L. Dodge. All the openings in this foyer are heavily draped in silk velour of peacock-blue richly embroidered in gold.

The auditorium opens directly from the foyer. "Majestic" is the only word appropriate for the effect of this interior. A

sensation of vastness is afforded by the enormous height of the ceiling and by the long lines formed by the constructive arches supporting the ceiling. The intention of the architect was to make this ceiling represent a vaulted arbor of lattice covered by luxurious vines thickly laden with fruit. The effect of this happy idea is greatly enhanced by its color-treatment, which gives glimpses of turquoise-blue behind the golden leaves and of purple behind the clusters of golden fruit. Innumerable soft lights are inserted in the strong arches forming the sounding-board, and in the next three succeeding bays are the proscenium-boxes. The elaboration of the auditorium reaches its height in the handsome frieze at the level of the first balcony, where, supporting the gallery above, are the beautiful caryatides modelled by Martini.

All the hangings in the auditorium are of crimson plush, and in the boxes are hung valances embroidered in gold and blue, and the entire walls of boxes are hung with an imported French brocatelle of a handsome design.

The ladies' room, adjoining the auditorium, has the walls hung in a yellow silk damask. The powdered-gold furniture for this room is in the style of Louis XIV and is covered with a rich brocade.

The smoking-room, decorated in the style of Henry II, has a frieze of painted helmets, armor, flags, etc., above a dado of leather.

ORNAMENTAL PLASTER-WORK.

To the Sleep, Elliot & King Company, of Boston, contractors for the ornamental plaster-work, much credit is due for their part in producing the beautiful interior effects. The work here is, however, only in keeping with that which this Company has done elsewhere—notably at Keith's Boston and Providence theatres, the Public Libraries in Lynn, Fall River and Holyoke, Mass., and in Providence, R. I.; at the Hollis Street and Colonial theatres, and Hotel Carlton, Boston, and Stearns Chambers, Brookline. Their work may also be seen in many of our better class of residences, in churches and in public buildings throughout the country.

The Sleep, Elliot & King Company plaster ornamentation may be seen in as many, if not more, theatres in this country than that of any other firm. They have had a long train-

ing in theatre decoration. This training has taught them how to obtain any desired result in modelling for different heights and positions so as to attain architectural harmony. In this they have been peculiarly successful and the Majestic Theatre is but another of their artistic successes.

This Company, we understand, has undertaken to meet the requirements of architects and owners by having all its work personally superintended by one of its members—each an artist and practical man in his business. The ceiling of the foyer of the Colonial Theatre, this city, executed in the Louis XV style, is an instance of art in plaster, being abso-

chants' Building, Technology Chambers, Municipal Building, Columbia Road, Boston; Penobscot County Court-house, Bangor, Me.; Essex County Court-house, Lawrence, Mass.

These most recent of the Columbian Company's contracts illustrate fairly the class of work done through their Boston office. The Majestic is a strong addition to the list.

SCAGLIOLA-WORK.

The scagliola-work, also a noticeable feature, especially in the lobbies of the theatre, was done by the Artificial Marble Company, of New York, with offices at 1133 Broadway.

Similar work by this same Company for the New York Athletic Club, Sherry's Hotel and Bowery Savings Bank, New York City, at Harvard University, Cambridge, Mass., and in many other public and private buildings in the East, all attest the ability of these gentlemen to maintain a high place in their particular line.

BRASS-WORK.

A description of the special features connected with the construction of the Majestic Theatre would be incomplete without mention of the work done by Messrs. W. P. Marble & Company, of this city, who furnished the brass-work throughout the building.

Commencing with the railing fronting the box-office in the lobby to the orchestra, balcony and proscenium-box railings, the work and material is of exceptional excellence.

The brass pedestals supporting the velour-covered railing in the boxes, balcony and orchestra are from an original design by the architect, and the accompanying illustration will give an idea of their attractiveness. Of these there are sixty-two 12 inches in height and forty-eight of 18 inches—110 in all. They are composed of the finest brass mixture prepared especially for this order, with the finest of dipping; and no porous marks are visible. The high lights are finished in bright polish, the depressions in mat surface, and the best grade of lacquer used in the finish. Under the electric-lights the general effect of these pedestals is that of pure gold, the mat surface showing the color of ormolu gold. The accuracy of fitting is shown by the absence of any depression in the velour covering



The Proscenium-Boxes of the Majestic Theatre, Boston.

lutely true to the artistic feeling of this style throughout. And the Hollis Street Theatre, also, is an instance of the possibilities in plaster-work under skilled supervision.

Our illustrations this week give a fair idea of the work performed by this house.

MARBLE-WORK.

The marble-work, which was done by Mr. L. M. Glover, 220 Devonshire Street, this city, Boston representative of the Columbian Marble Quarrying Company, of Rutland, Vt., is deserving of especial mention, as it is an exceedingly creditable piece of work. Our attention has been called from time to time to other contracts filled by this Company, through Mr. Glover's agency, notably the New England Conservatory of Music Building, Mer-

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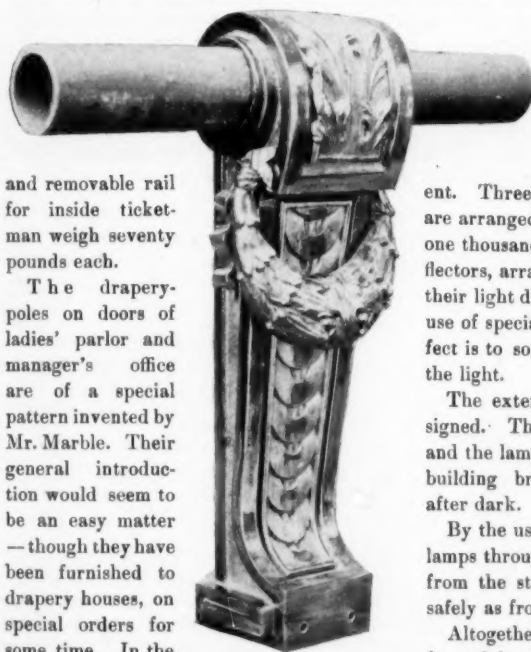
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surrounding the base of these pedestals, which, considering their weight, about thirty pounds each, is remarkable. The railing is of 2-inch piping, and the bending to meet desired curves, particularly for the boxes, required the best of workmanship. The box-office rail



Brass Standard and Rail. By
W. P. Marble Co.

and removable rail for inside ticket-man weigh seventy pounds each.

The drapery-poles on doors of ladies' parlor and manager's office are of a special pattern invented by Mr. Marble. Their general introduction would seem to be an easy matter—though they have been furnished to drapery houses, on special orders for some time. In the opening and closing of the doors the draperies are undisturbed, the folds remaining the same at all times. Though a minor detail, they are worthy of notice.

Messrs. Marble & Company have not heretofore figured conspicuously as direct bidders on such contracts, though their work is to be seen in many of our public buildings and private residences. In this building is shown their ability to meet the most exacting requirements in their line of work, and it is presumable that hereafter we shall see them more directly identified with similar contracts.

ELECTRIC LIGHTING.

The contract for installing the electric-lighting plant was placed with the Erickson Electric Equipment Company, of this city, and the work was carried forward under the personal supervision of Mr. William Erickson, General Manager.

It was this Company which installed an eleven-thousand-light plant in the Winchester Repeating Arms Company's Factory at New Haven, and also a plant in the Malley Building in the same city; in the Capitol at Augusta and State Insane Asylum at Bangor, Me.; in the Colonial Theatre, Westminster

Chambers and new Masonic Building, this city; also, the Westville Street School, Columbia Road School, Advertiser Building and Boylston Street Trust Company Building.

Two generators, one of fifty kilowatts and another of seventy-five kilowatts of the Ridge-way type have been placed in the basement of the Majestic. Although there are 3,855 sixteen-candlepower lamps connected throughout the building, they are so carefully distributed that no waste of light is apparent.

Three hundred and sixty of these lights are arranged over the ceilings; approximately one thousand are in the wings and behind reflectors, arranged in such a way as to throw their light directly upon the stage; and by the use of special globes on all ceiling-lamps the effect is to soften without appreciably dimming the light.

The exterior lighting is equally well designed. The huge electric sign on the roof and the lamps arranged upon the front of the building brilliantly illuminate the building after dark.

By the use of the Cushing switchboard the lamps throughout the house may be regulated from the stage or foyer as conveniently and safely as from the main switchboard.

Altogether the Erickson Company has performed its work in a way which, apparently, provides for every contingency and for every theatrical effect which may be desired.

STAGE-FITTINGS.

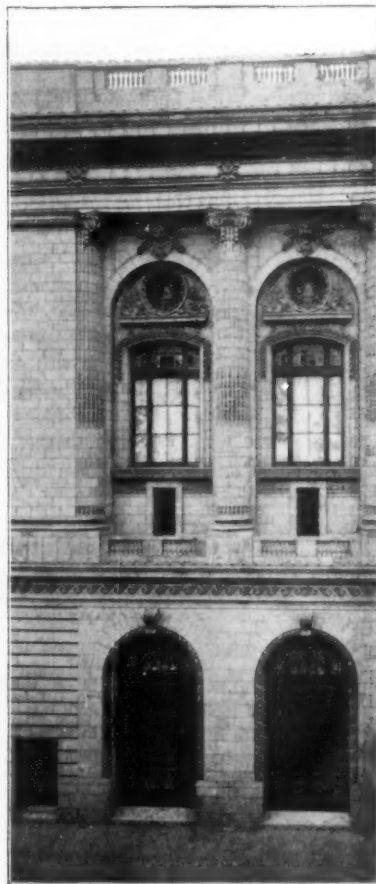
The stage-fittings are from Claude L. Hagen, of New York City, and are as complete as that gentleman's knowledge of theatrical requirements can make them. The works of Mr. Hagen are the largest in the world devoted exclusively to this line of business. His corps of assistants are thoroughly experienced specialists, and under the direction of such a competent head results here and in other instances have been accomplished which otherwise might have been impossible. Certainly nothing seems wanting to the perfect working of stage business.

Mr. Hagen is widely known as an adept in stage-mechanism. He is so frequently consulted concerning intricate mechanical devices for stage-use, plans of theatres and their equipment, stages and their proportions, and kindred matters, that he may fairly be considered a leading authority. So, when it is said that the stage-fittings of the Majestic represent Mr. Hagen's best efforts in his line, it seems superfluous to say more concerning this essential and important portion of the construction and operation of a theatre.

In conclusion: space does not permit us to mention at length the work of Messrs. Woodward & Lynch, A. B. Robbins, the Wells & Newton Company and others participating in the construction. Later we hope to have an opportunity of specially mentioning these firms in other connections.

FIREPROOFING.

The building may be said to be absolutely fireproof, at least as nearly so as engineering skill and the use of the most approved materials can make it; for the Roebling Construction Company, through its New England agent, Mr. Andrew W. Woodman, had the contract for this portion of the work, and it was completed in a way altogether satisfactory



Detail of Front: Majestic Theatre.

to owners and architect, and danger from destructive fire is reduced to a minimum.

The roof is built of cinder-concrete and steel and finished with a floated surface upon which the roofing-felt was mopped. The floors throughout the building are built of

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

cinder-concrete and steel, with haunches encasing the webs of beams, and finished on top with a granolithic surface.

Not a particle of wood has been used in construction except for seats.

The difficulties in carrying the work forward may be judged when we say that just as soon as the steel contractors had completed enough of the roof-framing to permit of another gang of workmen, the fireproofing-men started their work; and before the steel-men had made their last connection of roof-beams the concreting was well under way, and so throughout the entire work Mr. Woodman was obliged to make his arrangements with reference to other work being carried forward at the same time, and this gentleman had many difficult problems to solve before completion of the contract; but the work as completed will stand for a good example of his engineering skill.

A RAILROAD BEAUTIFUL.

THAT the "railroad beautiful," where it traverses a great city and its suburbs, should be a goal, considered and worked for by sane business-men who have invested in the "soulless corporation," would seem to be a dream of the faddist or the theorist's whimsical claim. Not that railroads are beyond the need of beautifying, nor that their black and cindery course is hopelessly ugly; but that railroads, with their strictly utilitarian purpose and common ugliness, seem naturally the antitheses of aesthetic endeavor. And yet the effort to improve aesthetically the appearance of the railroad's right of way and to beautify stations and their surroundings has made almost as rapid a progress with us in recent years as have the forward striding efforts in city and town improvement. Instead of a faddist's dream or the whimsical claim of the theorist, the purpose to beautify the railroad is a matter of common observation and knowledge, the principal systems of the country now having their landscape-architect as certainly as their roadmaster.

A pioneer in the work was the Boston and Albany Road, and the story of the beginning is of not a little interest. The Pennsylvania and Old Colony Systems, indeed, began the task of beautifying their station surroundings at about the same time, but the Old Colony

has not carried the matter very far, and the Pennsylvania has adopted a more conventional and less excellent plan, while of all the roads in the country the Boston and Albany, by the degree to which it has developed the project on the so-called Newton Circuit, a short stretch of road that makes a round of Boston's pretty western suburbs, touching at twenty-one stations before the terminal is reached again, offers the most complete and perfect object-lesson available of what the "railroad beautiful" may be. The opportunity was an unusually good one, for the stations are close together, often with barely a mile between them, the country is rolling, fertile and picturesque, and the towns have long been remarkable for their beauty and orderliness.

The road now maintains its own nursery of hardy shrubs and plants. The principal nurseries of the road, the department claims, are the station gardens themselves, where the shrubs are grown quickly and transplanted as necessity arises. There is no expense for showy summer vegetation and for a brilliant carpet-gardening of short-lived flowers, the effect of color and picturesque grouping being obtained far more economically and far better by massing shrubs and plants and making use of perennials.

Now that the Boston and Albany has been



Wellesley Hills Station.

absorbed in the greater system of the New York Central, it is to be hoped that its good and lovely example will bear fruit in far extensions of the "railroad beautiful." Such a result would have an even national importance, changing the face of the country "as seen from a car window," and carrying its influence very far.

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NOTES.

THE Frink System of Reflectors is the best for lighting pictures in galleries and private houses and is coming more and more into use. The Frink Company has recently completed the installation of their Reflectors in the American Art Galleries, New York, also in the new galleries of the Drexel Institute in Philadelphia, and have just finished putting them in the delivery-room of the Boston Library for the purpose of lighting Mr. Abbey's "Holy Grail" decorations. Such commendation is sufficient to establish the superiority of the Frink Reflectors.

THE Otis Company has been awarded the John Scott Legacy Medal and Premium by the Franklin Institute for their electric elevator for private residences, which dispenses with the services of an attendant and is operated by merely pushing buttons at the various landings and in the car. The Committee on Science and the Arts, which recommended the award, made a thorough inspection of several existing installations, and their report is highly commendatory of the ingenuity of design, the safety of operation and the substantialness of construction of this elevator.

THE ornamental plaster and cement work in the Essex County Court-house, at Lawrence, Mass., is being rapidly pushed to completion by Herbert Fowle, of this city.

It is as nearly fireproof as possible, the finish for windows, doors and panelled dado being of Keene's English cement with marble base.





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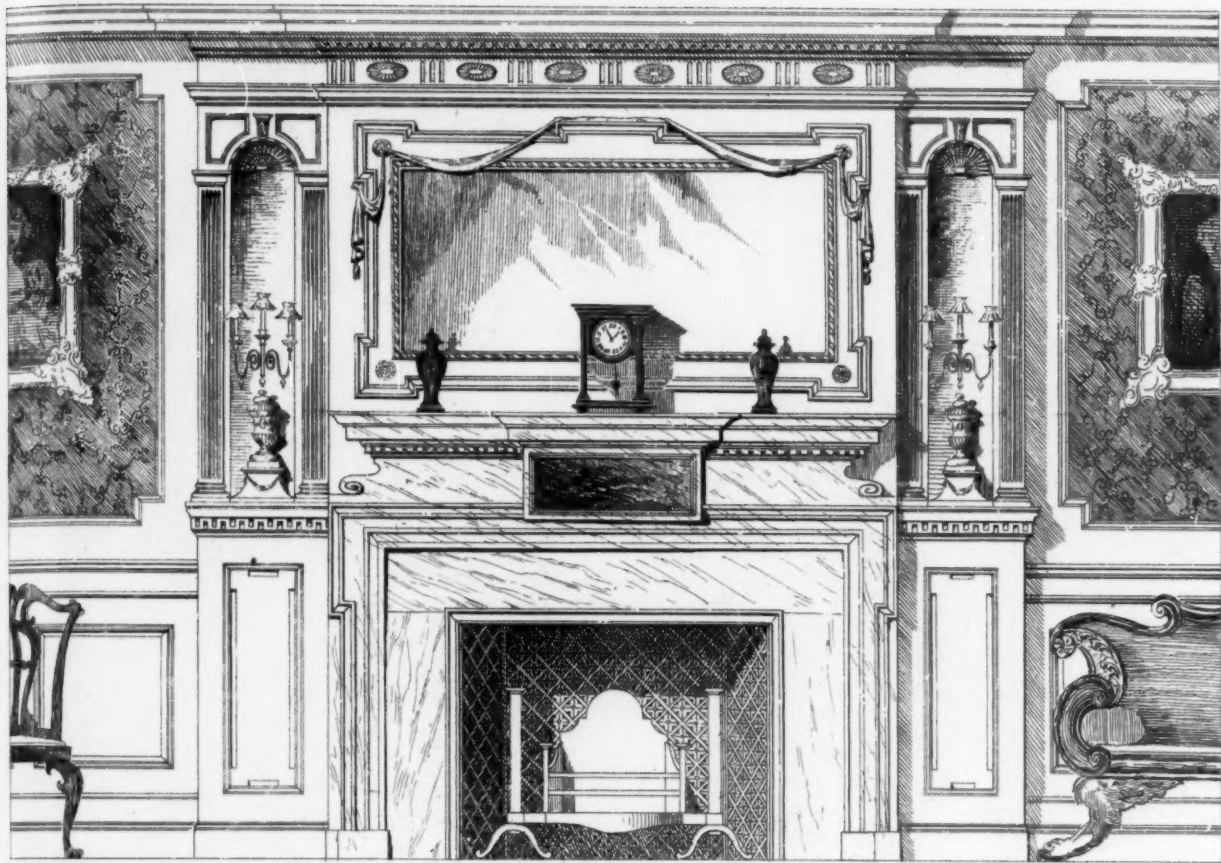


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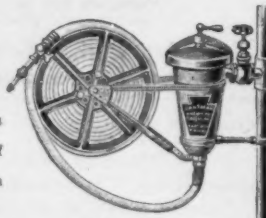
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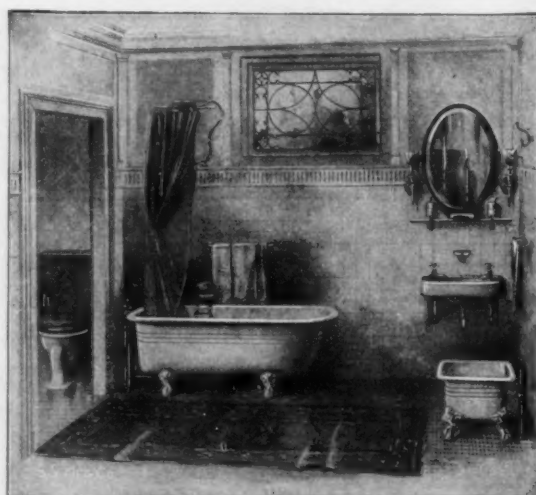
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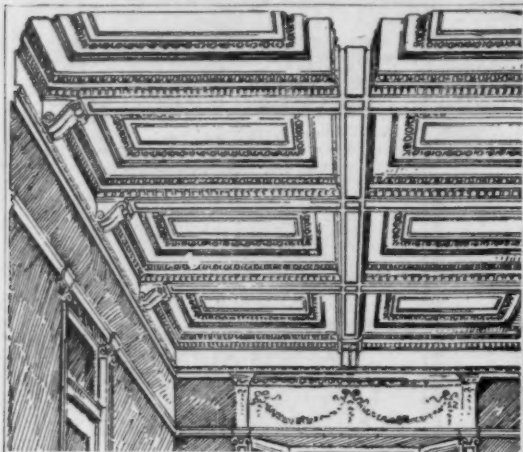
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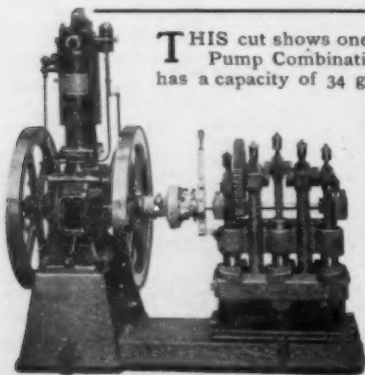
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A principal contractor is under obligation to treat upon an equal basis all estimates which he "receives" prior to putting in his own bid. Estimates must be considered as "received" when they come into a principal contractor's possession, either by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

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

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

ARTICLE II.

Award of Sub-Contracts.

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

ARTICLE III.

Penalty for not Awarding Contract to Lowest Sub-Bidder.

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

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

ARTICLE V.

Payments to Sub-Contractors.

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

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

ARTICLE VII.

Obligation of Sub-Contractor to Principal Contractor.

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

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

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

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

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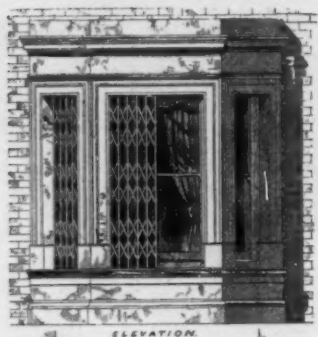
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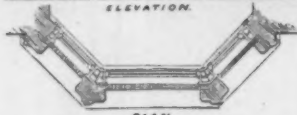
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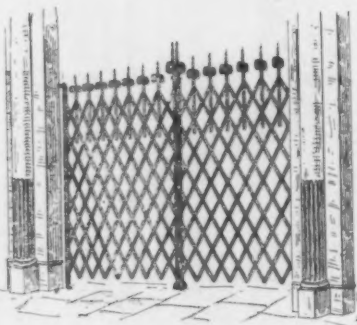
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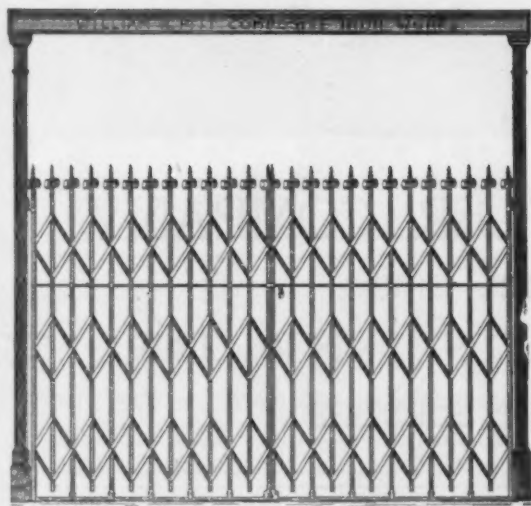
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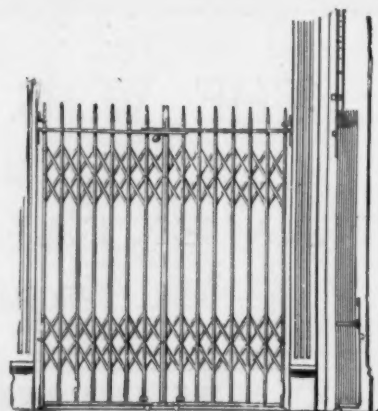


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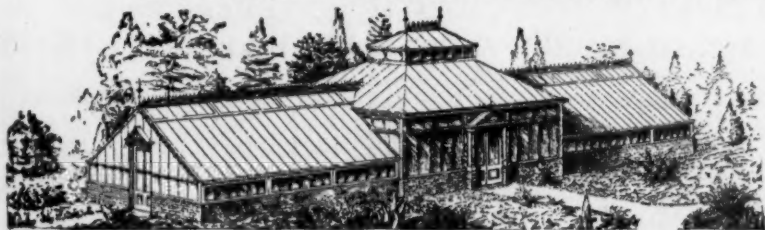
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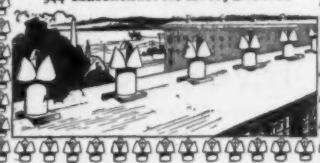
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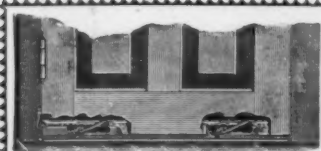
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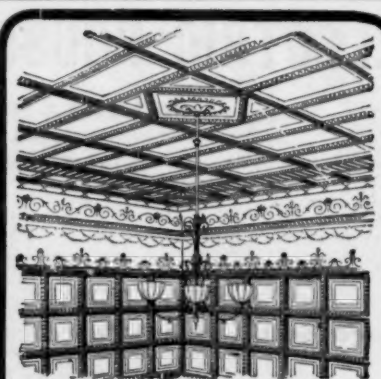
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The Bill prays for a preliminary writ of injunction, to be continued during the pendency of the suit, and upon the final determination thereof to be made perpetual, and also demands an accounting and damages.

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

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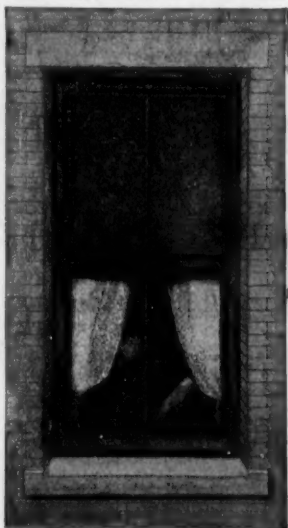
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New Advertisements.

CLAUDE L. HAGEN (New York, N. Y.), Stage Architect and Carpenter. Page xi.
THE ARTIFICIAL MARBLE CO. (New York, N. Y.), Interior Decorative Marble. Page iii.
W. P. MARBLE CO. (Boston, Mass.), Brass Finishers. Page x.
BOSTON & ALBANY R. R. (Boston, Mass.), Railroad. Page iii.
CHICAGO & ALTON RAILWAY (Chicago, Ill.), Railroad. Page xi.

See last or next issue for the following advertisements:—

Bartlett Lumber Co.
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Grant Pulley & Hardware Co.
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ARCHITECTS' REMOVALS, Etc.

THE American Art Association will shortly remove from the Quai Conti, Paris, and reopen its rooms at No. 74 Rue Notre Dame des Champs. 1419

CHARLES M. ROBINSON and Geo. Winkler have formed a joint partnership under the name of Robinson & Winkler, architects, with offices at 1526 to 1530 Park Building, Pittsburgh, Pa. 1420

MESSRS. WARD & TURNER, architects, 110 Tremont St., Boston, announce that on the fifth of March they will remove to new quarters on the eighth floor of the Essex Building, 683 Atlantic Ave., Boston. 1420

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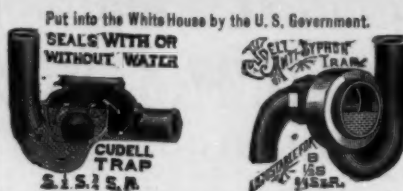
BUILDING INTELLIGENCE.

(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 voluminous information, especially from the smaller and outlying towns.]

ADVANCE RUMORS.

Atlanta, Ga.—Plans have been drawn by G. W. Foote, Inman Building, for a fifteen-story steel fire-



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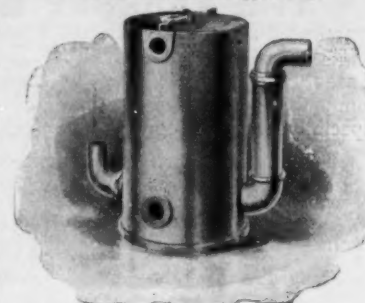
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BUILDING INTELLIGENCE.

(Advance Rumors Continued.)

proof building for a Stock Co. to be erected on Broad and Alabama Sts.; cost, \$300,000.

Bloomington, N. Y.—Under the will of Mrs. Ellen Josephine Banker, the Bloomington Asylum receives \$25,000 to erect a pavilion in memory of her husband, who was a Governor of the Society of the New York Hospital.

Brooklyn, N. Y.—Work will begin soon on a new factory for Morris Tastasky, 47 Summer Ave., and T. Kleiberg, 956 Myrtle Ave., at a cost of \$20,000. Plans by Architect Theodore Engelhardt, 905 Broadway, New York City, call for a five-story brick building, 50' x 67'.

Another theatre will be built in Fulton St., above Flatbush Ave. The property No. 451 Fulton St. and 40 to 50 Ashland Pl. has been sold for \$125,000, and the buildings on the site will be torn down in the next month and work on the new theatre begun as soon as the site is cleared.

It is reported that the Board of Estimate has appropriated \$1,000,000 for the court-house to be erected on Jerusalem St.; \$50,000 for the Gates Ave. Court-house; \$90,000 for the public bath in the Eastern District, and \$50,000 for improvements to the Borough Hall.

Burlington, Vt.—The public building here, it is authorized, shall be sold and a new building to cost \$200,000 erected.

Cambridge, Mass.—William C. Lane, Librarian of

BUILDING INTELLIGENCE.

(Advance Rumors Continued.)

Harvard University, in his annual report, speaks of the increasing congestion of the present library and the necessity for more spacious quarters. He reviews the work of the special committee appointed by the corporation to consider and report upon the needs of the university in reference to a new library building, and which reported an estimate of about \$750,000 as the cost of such a building as is required.

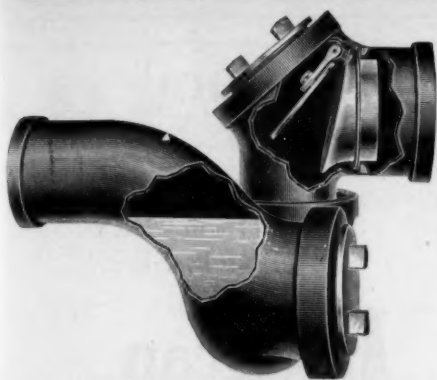
Carthage, Ill.—Robert Hotchkiss, of Peoria, has prepared plans for the Hancock Co. Court-house. Estimated cost, \$100,000.

Chicago, Ill.—The plant of the Goss Printing Press Mfg. Co., Ashland Ave. and 15th St., is to be enlarged. Huehl & Schmid, 163 Randolph St., have prepared plans for the addition, which will be three stories, 243' x 80', of stone and brick, costing \$50,000.

Specifications have been written for the \$30,000 club-house to be erected at the corner of Western Ave. and Division St. Plans by Architect M. Spitzer, 315 Dearborn St. It will be a four-story structure, 49' x 125', of brick and stone, to contain stores and offices, public halls, auditorium, club-rooms, etc.

Plans have been nearly completed and estimates are about to be taken for an addition to the Cooper School at 19th St. and Ashland Ave. W. B. Mundie, architect for the Board of Education, has made designs for an eight-room building of brick and stone to cost about \$50,000.

Cleveland, O.—Andrew Carnegie has decided to

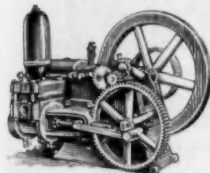


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BOSTON, MASS.

Branch Office, Providence, R. I.

BUILDING INTELLIGENCE.

(Advance Rumors Continued.)

give \$100,000 to Western Reserve University, of this city, to establish a school for the training of librarians.

Clinton, Ia. — Patton & Miller, Chicago, are preparing plans for a Carnegie Library to be erected here at a cost of \$45,000.

Corsicana, Tex. — The plans of J. E. Flanders, of Dallas, have been accepted for the three-story court-house to be erected here, to cost \$125,000.

Crestline, O. — The Crestline Mfg. Co. has been organized here with a capital of \$50,000, to manufacture iron and brass pumps, plumbing specialties, and gray iron castings. It will erect a machine-shop, 60' x 175', an iron foundry, 100' x 100'; also a warehouse, 36' x 89'. The statement is made that the plans are already in the hands of the architect.

Grand Rapids, Mich. — Arthur Fabish and Felix Dumas, of Chicago, Ill., and Col. Wood are reported interested in the erection of a \$100,000 theatre here.

Homestead, Pa. — The Homestead Trust Co. will erect a \$100,000 bank building here.

Jersey City, N. J. — The W. B. Watson Amusement Co. has decided to erect a theatre here, to cost \$100,000.

Kansas City, Mo. — Orthwein & Thompson will erect amusement buildings at Hardesty and Independence Aves., to cost \$74,000.

Laconia, N. H. — The Pepperell Co., Biddeford, Me., is planning to expend \$150,000 in improvements on the Laconia division. The work will be started early this spring and will be rushed to completion.

La Crosse, Wis. — Handy & Cory, architects, of Chicago, will prepare plans for the proposed \$100,000 hotel.

Lawrenceville, Pa. — Plans have been completed by W. A. Thomas, Carnegie Building, Pittsburgh, for a four-story commission house to be erected at Penn Ave. and 18th St., at a cost of \$60,000.

Leavenworth, Kan. — Plans for a new headquarters building will be forwarded to Washington for approval in the near future. It is expected that the money to erect this and other buildings will be set aside in March. The new building will be the finest post or army headquarters structure of its kind in the country, aside from the war department building in Washington.

Louisville, Ky. — A site for the erection of a new \$25,000 library building has been purchased by the city and architects have been asked to submit plans.

The Sneed Architectural Iron Works will erect new shops at 10th and Hill Sts. to cost \$50,000.

Lynn, Mass. — Report states that two large shoe factories are to be built, one on Broad St. to be 48' x 150', and eight stories high; one on Washington St., 50' x 115', and eight stories high, also an addition to steel works on Fairchild St. to be 120' x 500', of brick and iron; an eight-room school-house on Boston St., Tower Hill, and a fire-engine house for Ward 5.

BUILDING INTELLIGENCE.

(Advance Rumors Continued.)

Macon, Ga. — It is stated that Henry Horne is at the head of a movement to erect a ten-story steel-frame office-building. Cost, \$125,000.

McKee's Rocks, Pa. — Seymour Davis & Paul A. Davis, 3d, Philadelphia, have completed plans for the Y. M. C. A. Building to be erected here. The plans show a three-story brick building, 60' x 80'.

Meriden, Conn. — Plans have been drawn by W. B. Page, 5 Court St., Boston, for a building to be erected here by Swift & Co., the Chicago packers. The building will be two-story brick, 50' x 118', costing \$25,000.

Milwaukee, Wis. — The Plankinton Estate has about completed arrangements to erect two additional stories to the Boston store building at Grand Ave. and 4th St. Cost, \$50,000.

Minneapolis, Minn. — Plans have been drawn for eight-room additions to the Hawthorne, Bryant, Franklin and Monroe school-buildings, at an aggregate cost of \$128,000. The additions will be modern in every respect.

Montgomery, Ala. — The Senate is stated to have reported favorably on the proposed appropriation of \$150,000 for extending and improving the Capitol grounds and buildings.

Morgantown, W. Va. — The contract has been awarded Stuart Westenhaver, of Martinsburg, for the erection of the edifice for the Methodist Episcopal Church, at a cost of \$70,000.

Needham, Mass. — The Hopewell Manufacturing Co., of Highlandville, has purchased of Thomas Barrett 20,000 feet of land on Hillside Ave., Highlandville, adjoining its present location. The company will remove one of its buildings to the new lot and will erect a steel structure on its present lot.

New Castle, Ind. — The trustees of the First Methodist Episcopal Church of this city are arranging plans for the construction of a \$25,000 edifice.

New Rochelle, N. Y. — It is reported that Adrian Iselin, the banker, whose family has spent \$750,000 building Catholic churches and schools here, has awarded a contract for the building of a \$30,000 church and parish-house for the Italians of this place. The new church will be known as St. Joseph's and will be built on a lot in West New Rochelle, 200' x 200', also given by Mr. Iselin. It is expected that it will be completed by August 1.

New York, N. Y. — It is stated that the Barnard School for Boys, 119 W. 125th St., will make extensive alterations to the dwelling at the corner of St. Nicholas Ave. and 146th St., which they have leased for five years for occupancy.

Extensive alterations will be made by Oesterleicher Bros., 451 Sixth Ave., to the four-story brick building on a plot, 49' 4" x 100', at the no. thwest corner of 29th St. and 6th Ave. for their own occupancy.

The Horowitz Realty Co., 67 Seventh St., will erect 2 six-story tenements, 50' x 77' 10" each, cost \$100,000, at 208 to 214 Seventh St. G. F. Peiham, 503 Fifth Ave., is the architect.

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BUILDING INTELLIGENCE.

(Advance Rumors Continued.)

Omaha, Neb. — A new school-building to cost \$50,000 is proposed, to replace the Vinton and Forest Schools.

The South Omaha Stockyards Co. will erect an addition to the main structure of the Exchange Building, to cost about \$50,000.

Ottawa, Ont. — The contract for the erection of the hospital of the Sisters of Mercy on Cambridge St. has been awarded to Jos. Bourque, of Hull; cost, \$70,000.

Philadelphia, Pa. — A large dwelling operation is planned by Pemberton & Co., of the Girard Building. Sixty houses in the 40th Ward will be erected. The buildings will be two and three stories high and will have slag roof, hardwood finish and furnace heat.

Edwin F. Durang has been commissioned to prepare plans for alterations and additions to St. Agnes' Hospital, at Broad and McKean Sts. The new work will include the erection of a stone addition, 60' x 100', to conform architecturally to the main building of the institution.

Work is about to be started on a large addition to the plant of the Newton Machine Tool Works at 24th and Vine Sts. Addition will consist of a three-story brick building, 75' x 200'. It will cost about \$50,000.

Architect Frank C. Miller is taking sub-bids on an operation of 31 dwellings to be erected on Greene St., between Wyoming and Apsley Sts. They will all be of Pompeian brick, three stories in height. The total cost of the operation will be about \$125,000.

It is reported that when the leases of the present tenants expire the building at the northeast corner of 5th and Chestnut Sts., purchased by the Stephen Girard estate, will be torn down and replaced by a large office-building.

Work has started on the erection of 50 dwellings in the vicinity of the municipal hospital at 22d St. and Lehigh Ave. by G. W. & J. M. Zane. The best materials will be used in construction and interiors will be fitted up with the latest dwelling appliances. It is Mr. Zane's intention to erect 1,000 houses, to cost over \$400,000.

Work is about to be started on an addition to the plant of the Newton Machine Tool Works at 24th and Vine Sts. It will be a three-story building, 200' x 75', of brick, costing \$50,000. John R. Wiggins & Co., 721 Reed Building, have the contract.

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BUILDING INTELLIGENCE.

(Advance Rumors Continued.)

Port Deposit, Md.—Newman & Harris, of Philadelphia, are working upon plans and specifications for a stadium to be erected here for the Jacob Tome Institute. It will be constructed of brick and concrete and is to have a seating capacity for 800 persons.

Portland, Me.—The Guild Manufacturing Co., to manufacture machines, tools and heating and plumbing articles, has been organized in the office of Charles J. Nichols in this city, with a capitalization of \$100,000.

The matter of a new Cumberland County Courthouse is being considered.

Pottsville, Pa.—George C. Dietrich, Philadelphia, has posted plans for a new Methodist Episcopal Church. It will be of stone, in the Gothic style of architecture, 78' x 156', and will cost about \$200,000.

Providence, R. I.—This city will doubtless have a new Chamber of Commerce building in the near future, costing in the neighborhood of \$300,000.

Pullman, Ill.—The Bd. of Educ. has decided to erect a 12-room brick school at 106th and Fulton Sts., to cost \$80,000.

Quebec, Can.—It is reported that Little & Walker, chemical experts and engineers, 19 Exchange Pl., Boston, contemplate building here a manufacturing plant of three buildings. It will be of brick and steel, to cost about \$1,250,000. Hall & Kimball, 101 Tremont St., Boston, have drawn plans.

Ridgway, Pa.—Plans for the \$40,000 stone and steel church building for the Methodist Episcopal congregation are being prepared by Architect W. O. Weaver, Harrisburg.

Rochester, N. H.—This city has voted to build a new fire-station at an expense of \$17,000.

San Jose, Cal.—The Masons of this city have had plans prepared for a \$60,000 temple to be erected on N. 2d St.

Saratoga, N. Y.—Mrs. Spencer Trask is planning to build a summer home for working girls on the banks of Lake George. It is expected to be ready for vacation time next summer.

Springfield, Ill.—The plans of Geo. H. Helmle, 430 S. 5th St., have been accepted by the Bd. of Educ. for the school to be erected at S. 21 and Laurel Sts., at a cost of \$40,000.

Springfield, Mass.—William A. Whitcomb has purchased the Asa Harrington property on the corner of N. Main and Granite Sts. The price paid was \$12,500. It is expected that Mr. Whitcomb will



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BUILDING INTELLIGENCE.

(Advance Rumors Continued.)

erect a substantial business block. The property has a 97-foot front on Main St. and runs back 200 feet. It now contains two houses, one of two tenements and the other of three.

St. Louis, Mo.—The Mercantile Trust Co. have effected the sale of the southwest corner of Broadway and Spruce St., a two-story brick building with stores on the ground floor and rooms above. It was sold to Paul Brown, managing director of the Continental Tobacco Co., for \$10,000. Mr. Brown buys for an investment and contemplates extensive improvements to the property.

St. Paul, Minn.—The will of the late Mrs. Cornelia Day Wilder Appleby provides that the principal of the vast estate be devoted to founding the Amherst B. Wilder charity for the poor. The will provides that a suitable building shall be erected in a central point in the city. It is reported that about \$5,000,000 will eventually be at the disposal of the trustees.

Oscar E. Miller, of Milwaukee, and W. W. Wittig, of Minneapolis, are having plans prepared for a new theatre which they propose to erect the coming season; cost, \$75,000.

Summerville, Ga.—It is stated that Samuel J. Sexton will erect a \$100,000 residence here.

Terre Haute, Ind.—Designs are being prepared by S. S. Beman, 135 Adams St., Chicago, for a new two-story structure for the U. S. Trust Co. Cost, \$40,000.

Topeka, Kan.—The Commercial Club is reported to be considering the erection of a building at 7th and Jackson Sts., to cost \$65,000.

Utica, N. Y.—The commission having in charge the construction of a \$350,000 court-house in this city has selected the plans submitted by O. W. Cutler, S. S. Ward and A. C. Turner, of Boston.

Waco, Tex.—Plans are being drawn by Patten & Miller, Chicago, for a Carnegie Library, costing \$30,000, to be erected here.

Washington, D. C.—The building to be erected here by the Dominican Fathers for the new novitiate and scholasticate will be very large. It will probably be completed in the fall of 1904.

The corner-stone of the new War College, which is about to be erected on the grounds of the "Barracks Reservation," was laid by President Roosevelt on February 21st. The War College will consist of a number of buildings, the largest, which will contain the class-rooms, to be 100 by 300 feet in size and two stories and basement in height. Congress has appropriated \$1,260,000 for the improvement of the grounds and the erection of the buildings, but it is anticipated that a considerable sum in excess of this amount will eventually be expended on the post. In addition to the college building proper there are to be erected quarters for the officers, a club-room for officers, quartermaster's stores, barracks and numerous other buildings.

Rutan & Russell, of Pittsburgh, Pa., are preparing revised plans for the two-story brick Washington-Jefferson College Library to be erected here, at a cost of \$50,000.

BUILDING INTELLIGENCE.

(Advance Rumors Continued.)

Wellesley, Mass.—The trustees of Wellesley College have voted to build a new dormitory to accommodate 75 students.

ALTERATIONS AND ADDITIONS.

New York, N. Y.—E. One Hundred and Twenty-fifth St., Nos. 165 167 and E. One Hundred and Twenty-sixth St., Nos. 168-170, three & five-story buildings will be altered to a theatre; \$75,000; o., Washington Life Ins. Co., 141 Broadway; lessees, Sullivan & Kraus, 126 E. 14th St.; a., Hackett-Hankinson Building Construction Co., 93 Watts St. **Deg St.** Nos. 13-17, three-story addition to twelve-story bk. office-building; \$150,000; o., N. Y. Telephone Co., on premises; a., C. L. W. Eidlinz, 1123 Broadway.

APARTMENT-HOUSES.

Chicago, Ill.—Sixty-seventh St., No. 436 42, four-story bk. apart., 38' x 80'; \$25,000; o., R. E. Kehl; a., A. G. Lund, 602 W. 63d St.

Worcester, Mass.—Grafton St., four-story bk. apart. block, 50' x 60'; \$21,500; o., A. M. Israel; a., J. P. Kingston; c., Eli Bellisle.

CHURCHES.

Nashua, N. H.—Bk. & st. church, 6' x 120', slate roof, steam; \$60,000; o., Rev. E. E. Buckle; a., W. H. McInty, Boston; not let.

New York, N. Y.—Sixty-second St., nr. 1st Ave., one-story bk. & st. church & school, 48' x 100' 5"; \$30,000; o., The Fifth Ave. Presbyterian Church, Inc., 7 W. 55th St.; a., Robertson & Potter, 160 Fifth Ave.

HOTELS.

New York, N. Y.—W. Forty-seventh St., Nos. 153-155, 94-story bk. & st. hotel, 40' x 90' 5", plastic slate roof; \$175,000; o., Rosa Brown, 31 W. 99th St.; a., G. F. Pelham, 503 Fifth Ave.

Forty-seventh St., Nos. 128-130, 94-story bk. hotel, 37' 6" x 90' 5"; \$275,000; o., E. R. Champion; a., Schwartz & Gross.

HOUSES.

Evanston, Ill.—Three-story bk. & st. dwell., 52' x 70', hot water; \$35,000; o., C. T. Anderson; a., J. R. Stone, 140 Dearborn St.

New York, N. Y.—Park Ave. and Sixty-first St., three-story bk. dwell. with stable, 50' x 57'; \$75,000; o., L. Nixon; c., E. Flagg.

Worcester, Mass.—Main St., two-story fr. dwell., 50' x 102'; \$5,000; o., J. B. Scrimgeour; a., J. P. Kingston; c., C. L. Peters.

Stoneland Road, two-story fr. dwell., 27' x 54'; \$5,400; o., J. B. Scrimgeour; a., J. P. Kingston; c., F. C. Johnson.

Richmond Ave., two-story fr. dwell.; \$5,500; o., James L. Warren; a., H. B. Hoyle; c., C. A. Colburn.

Agate Ave., two 14-story fr. dwells., 22' x 31'; \$3,400; o. & c., E. D. Ward.

Stoneland Road, two-story fr. dwell., 28' x 50'; \$5,500; o., J. B. Scrimgeour; a., J. P. Kingston; c., Dorais & Dupuis.

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BUILDING INTELLIGENCE.

(Houses Continued.)

Stoneland Road, two-st'y fr. dwell., 26' x 36'; \$15,000; o., J. B. Scrimgeour; a., J. P. Kingston; o., B. Isenberg.
Miltburg St., three-st'y fr. dwell., 40' x 50'; \$5,500; o. & c., H. C. Fisher.
Paine St., three-st'y fr. dwell., 31' x 44'; \$4,000; o. & b., J. Miles & Son.
Grafton St., three-st'y fr. dwell., 28' x 62'; \$6,300; o., Patrick Connors; a., Edwin Carlson; day work.

TENEMENT-HOUSES.

New York, N. Y. — E. Seventh St., Nos. 295-297, six-st'y bk. tenement, 40' x 81' 6"; \$40,000; o., I. Roth; a., J. H. Amster.

THEATRES AND HALLS.

New York, N. Y. — Third Ave., nr. 127th St., three & four-st'y bk. theatre, 16' 8" x 205'; \$100,000; o., Thomas W. Miner; a., J. B. McElfatrick & Son.

WAREHOUSES.

Chicago, Ill. — W. Monroe St., Nos. 1108-16, three-st'y bk. & st. warehouse, 60' x 125'; \$30,000; o., Borden's Condensed Milk Co.; a., J. J. Flanders, 1519 Moundnoek Block.

MISCELLANEOUS.

Worcester, Mass. — Albany St., two-st'y fr. boiler-house, 72' x 120'; \$9,000; o., Stewart Boiler Works; a., Cutting, Carleton & Cutting; c., E. D. Ward.
Main St., three-st'y car-barn, 90' x 112'; \$75,000; o., Worcester Consol. St. R. Co.; a., Frost, Briggs & Chamberlin; c., Norcross Bros.

PROPOSALS.

PIPE SEWERS.

[At Georgetown, S. C.]

Sealed proposals will be received by the Commissioners of Public Works until March 18 for constructing pipe sewers and for furnishing sewer pipe. Extent of proposed works is approximately 6 miles of pipe sewers from 8 to 15 inches diameter. J. B. STEELE, chairman, Georgetown, S. C. 1419

CAST IRON PIPE.

[At Washington, D. C.]

Office of the Commissioners, D. C., Washington, D. C. Sealed proposals will be received at this office until March 14th, for furnishing thirty inch (30") cast-iron water-pipe. Specifications and blank forms of proposal may be obtained at this office. HENRY B. F. MACFARLAND, HENRY L. WEST, JOHN BIDDLE, commissioners of the District of Columbia. 1419

PIPE SEWERS.

[At Bowling Green, Ky.]

Proposals for furnishing materials and constructing circular pipe sewers will be received until March 14. ALEXANDER WILLIAMSON, clerk. 1419

PAVING AND CURBING.

[At Menominee, Mich.]

Sealed proposals will be received until March 16 for furnishing the materials and doing the work for the paving and curbing of Main St. from the north line of Ogden Ave. to the north line of Wills Ave. to the north end of the draw bridge with vitrified brick paving blocks and stone curbing. WM. SOWERVILLE, city clerk. 1419

COURT-HOUSE.

[At Elba, Ala.]

Bids are wanted March 16 for erecting a \$20,000 court-house. F. M. CUSHING, Judge of Probate. 1419

CHURCH.

[At Columbus, O.]

Bids are wanted by the Com. on Plans and Specifications until March 10 for erecting St. Peter's German Evangelical Lutheran Church. CHRISTIAN GOTSCH, sec'y. 1419

CEMENT.

[At Wheeling, W. Va.]

U. S. Engineer Office, Wheeling, W. Va. Sealed proposals for furnishing and delivering about 32,000 barrels of American Portland cement for Ohio River dams will be received here until March 23, 1903. Information furnished on application. W. E. CRAIG-HILL, Capt., Engrs. 1420

BUILDING.

[At Cincinnati, O.]

Sealed proposals will be received at the office of the Board of Trustees, Commissioners of Waterworks, until March 17 for the construction of the coal storage houses, trestle approaches, inclines and tracks

PROPOSALS.

for the eastern pumping station located on the water-works grounds near the village of California and for the western pumping station located east of Lumber St., and between Eastern Ave. and the Ohio River in the city of Cincinnati, in accordance with plans, specifications and detail drawings on file in the office of the chief engineer of the Board of Trustees, Commissioners of Waterworks. AUG. HERRMANN, president. 1419

BUILDING.

[At Charleston, S. C.]

Sealed proposals will be received at the Bureau of Yards and Docks, Navy Department, Washington, until April 4, 1903, for constructing a brick and steel building for machine, boiler and blacksmith shops, Navy Yard, Charleston, S. C. Appropriation, \$342,000. Plans and specifications can be seen at the Bureau or the navy yard named, or will be furnished by the Bureau upon deposit of \$50 to secure their return. MORDECAI T. ENDICOTT, chief of bureau. 1421

BUILDING.

[At New York, N. Y.]

Sealed proposals will be received at the Bureau of Yards and Docks, Navy Department, Washington, until March 28, 1903, for constructing an addition to building No. 41 at the Navy Yard, New York. Estimated cost, \$25,000. Plans and specifications can be seen at the Bureau, or will be furnished by the Commandant of the navy yard named upon deposit of \$15 to secure their return. MORDECAI T. ENDICOTT, chief of bureau. 1421

BRIDGE.

[At Washington, D. C.]

U. S. Engineer Office, 2001 I St., N. W., Washington, D. C. Sealed proposals for construction of a highway bridge across Potomac River at Washington, D. C., will be received here until March 27, 1903. Information furnished intending bidders on application. CHAS. J. ALLEN, Lt. Col., Engrs. 1421

POWER HOUSE.

[At Merrill, Pa.]

U. S. Engineer Office, Wheeling, W. Va. Sealed proposals for building a power house, except foundation, at Dam No. 6, Ohio River, near Merrill, Pa., will be received here until March 27, 1903. Information furnished on application. W. E. CRAIG-HILL, capt., engr. 1421

SCHOOL.

[At Seymour, Wis.]

F. R. Dittmer, district clerk, will receive bids

PROPOSALS.

until March 16 for the erection of an eight-room school-building, from plans by Chandler & Park, architects, Racine, Wis. 1419

GRANITE.

[At Ram Island, Me.]

Sealed proposals will be received at the office of the Light-house Engineer, 25 Pemberton Sq., Room 1017, Boston, Mass., until March 16, 1903, for furnishing and delivering granite for the proposed light and fog signal tower on Ram Island Ledge, entrance to Portland Harbor, Me., in accordance with specifications, copies of which, with blank proposals and other information may be had upon application to LIEUT. COL. W. S. STANTON, U. S. A., Engineer First Light-house District. 1419

REPAIRING BREAKWATER.

[At Burlington, Vt.]

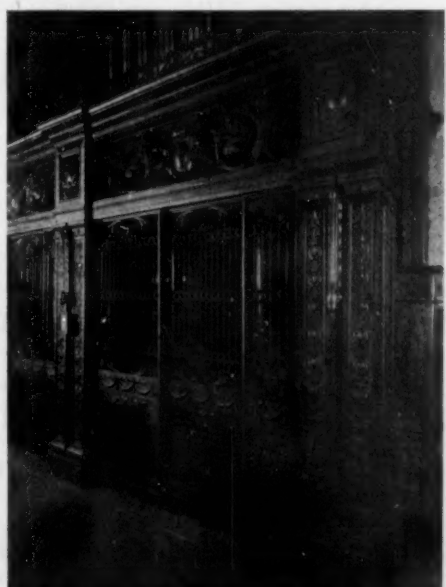
U. S. Engineer Office, Winthrop Building, Boston, Mass. Sealed proposals for repairing breakwater at Burlington, Vt., will be received until March 16, 1903, and then publicly opened. Information furnished on application. HARRY TAYLOR, Capt. Engrs. 1419

Treasury Department, Office of the Supervising Architect, Washington, D. C., February 17, 1903. Sealed proposals will be received at this office until 3 o'clock P. M. on the 24th day of March, 1903, and then opened, for the construction of the extension to the U. S. Post-office at Kalamazoo, Michigan, in accordance with the drawings and specification, copies of which may be had at this office or at the office of the Custodian at Kalamazoo, Michigan, at the discretion of the Supervising Architect. JAMES KNOX TAYLOR, Supervising Architect. 1419

HACKLEY HOSPITAL BUILDINGS.

[At Muskegon, Mich.]

Sealed proposals will be received at the office of Harry Sawyer, secretary, Muskegon, Mich., until noon, April 1, 1903, for furnishing the necessary labor and materials required to construct and complete the Hackley Hospital buildings at Muskegon, Mich. Plans may be seen at the office of Harry Sawyer, secretary, Muskegon, Mich., or at the office of A. W. Fuller and W. A. P. tcher, architects, Albany, N. Y. The work will be divided as follows: Mason, iron, carpenter, roofing, painting, glazing and elevator work will be included in one estimate. Electric work, separate estimate. Plumbing work, separate estimate. Heating work, separate estimate. Contractors will be required to deposit a certified check or surety company's bond with their bid as a guarantee that they will sign the contract in case it



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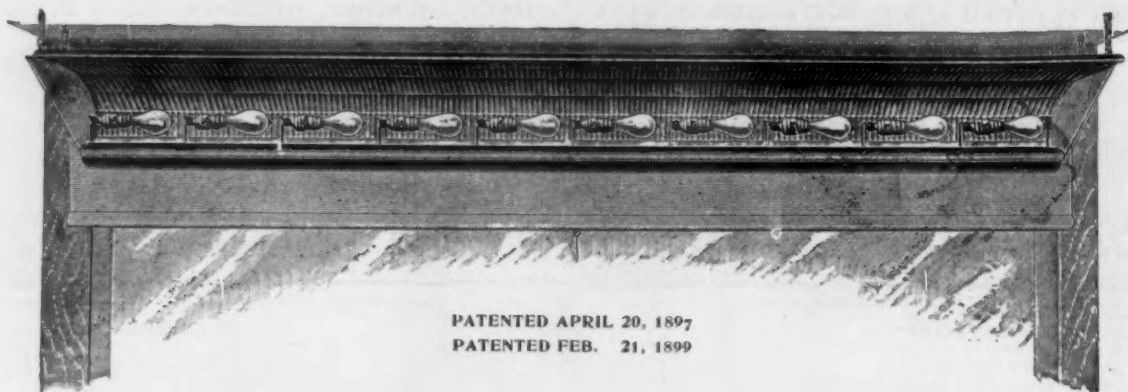
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PROPOSALS.

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1419

HOSPITAL.

[At Fort Lincoln, N. D.]
Office of Chief Q. M., St. Paul, Minn. Sealed proposals will be received at this office until March 23, 1903, for the construction of a hospital at Fort Lincoln, N. D. Plans and specifications may be seen and blank proposals with full instructions, had upon application here, or at the office of the Constructing Quartermaster, Bismarck, N. D. GEO. E. POND, C. Q. M.

1420

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. . . CODE OF ETHICS . . .

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

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

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

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

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

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

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

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

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

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

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

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

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

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

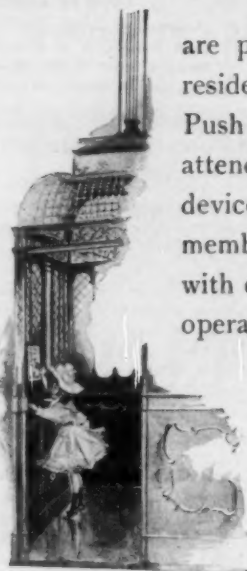
SECTION 13. No Member shall compete in amount of commission, or offer to work for less than another, in order to secure the work.

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

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

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