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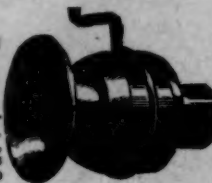
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THE AMERICAN ARCHITECT AND BUILDING NEWS.

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AUGUST 24, 1895.



SUMMARY:—

Authoritative Tests of Fireproof Materials to be undertaken.— The New Form of Contract of the Royal Institute of British Architects.—Some of its Obvious Defects.—Written vs. Numerical Terms in a Contract.—Work "shown or de- scribed" vs. Work "shown and described."—Who shall succeed a deceased English Architect?—Dr. Lilienthal's Experiments in Aerial Flight.—Reserving Seats in Euro- pean Railway Carriages.	73
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AS will be seen by a communication in another column, a committee of architects, engineers and representatives of insurance companies in New York has arranged to make an extensive series of tests of fireproofing materials, on a scale comparable with the conditions which exist in the case of fires in actual buildings. If the tests are well carried out, as they undoubtedly will be, they should add very much to our knowledge of the art of constructing buildings to resist fire, an art in which the Americans already excel. It will be remembered that a somewhat similar experiment was carried out in Berlin a year or more ago, an old house having been protected with a variety of materials, and then set on fire. The experiments, of which we gave an account at the time, were conducted with characteristic German thoroughness, and a set of metal bars, fusing at different but known temperatures, were placed in each room, to determine the actual degree of heat to which the fireproofing material in that room had been exposed. A very similar experiment was made later, at Vienna, if we recollect rightly, where an iron column, standing in the middle of a room built for the purpose, with brick walls, was cased over with four-inch brickwork, and a set of fusible bars put inside the casing, next the columns, and, after placing about the room blocks of various kinds of stone, the remaining space was filled with wood, which was set on fire. The heat, which was measured in the open room, as well as inside the column casing, by fusible bars, was so intense as to disintegrate some of the samples of stone, but it failed to affect the iron column, the temperature inside the brick casing not even rising high enough to melt the fusible bars. In the case of the New York tests, it is intended to try the effect of water as well as fire, and there is no doubt that the ingenuity of the committee will be successfully exercised to reproduce the conditions incident to real conflagrations. It is by such trials as this that our future building is to be made really enduring, and the public is, or should be, deeply interested in having them thoroughly carried out.

WE have received a copy of the new form of contract of the Royal Institute of British Architects, which is, of course, very interesting. Unlike our official form, it was not prepared by joint representatives of architects and builders, and, in fact, the London association of builders has

already expressed its disapproval of it, and advised its members to refuse to sign it; so that it seems to be questionable how much use will ever be made of it, at least in London.

A PART from this consideration, however, the document has what appear, to American eyes, grave defects, both in form and substance. Strangely enough, the first page only, out of the seven pages bound together, is intended to be signed, the other six consisting of a "Schedule of Conditions," which are referred to in the signed page as something "to be read and construed as forming part of this Agreement." It is quite likely that the English are more honest than we are, and it may be for this discreditable reason that we are more prudent than they; but it is certain that American builders would hesitate to sign a contract anywhere but on the last page, and even then would object to a seven-page form out of which four pages could be taken, by cutting a thread, and replaced by four other pages, leaving their signature intact. Of course, this does not mean that it is the habit of American architects or business men to make surreptitious alterations of contracts if they get a chance; but the art of avoiding law-suits consists principally in leaving no possible opportunity for fraud or mistake.

ANOTHER piece of carelessness, as we should think it, which we find in the signed page, consists in leaving a space of only about an inch and a half in length for writing in the contract price. It would be strange enough to have the consideration for an important building appear, over the signatures of the parties, in figures only, yet there is not room enough to write out one-fourth of the words necessary to express an ordinary contract price. The "Schedule of Conditions" has no blank space whatever for inserting the contract price; so that the only way by which the intention of the parties as to the price to be paid can be ascertained, in case of controversy, is by deciphering a row of figures, which, in most cases are nearly illegible, at best, and can be fraudulently altered with the greatest ease. It is to be remembered that each party has, usually, one of the copies of the contract in his possession. If either party should find it convenient to change the figures in his copy so as to represent a few thousand pounds more or less than they originally did, nothing would be easier than to add a few hair lines or blots for that purpose; and, in case of subsequent dispute, his copy would have exactly the same standing before a court as the other party's copy. Supposing, for the sake of illustration, that the builder has changed £10,000, in his copy of the contract, to £16,000, and has sued for the extra six thousand pounds, the assertions of the owner that the figures were increased by fraud or forgery would be met with the counter-assertion that the owner had himself fraudulently scratched out the tail of the figure 6 from his copy; and the jury alone would have to decide which party to believe. Notwithstanding the well-known infallibility of judgment of the "twelve good men and true" who form the glory of British jurisprudence, we imagine that a Londoner, about to build in Ireland, or Wales, with native contractors, would think twice before exposing himself to the chance of having such a question decided by the local juries. In this country, a bank would refuse to pay a check, even to a well-known customer, which had the amount expressed only in figures; and we doubt whether a building contract drawn in such a way could be enforced. The courts have already held here that figures are a mere memorandum, and it is not impossible that they would, if the evidence showed that there was a real misunderstanding between the parties as to what the intended contract price was, declare that the document did not, by mere figures, fix the consideration so as to exclude evidence that something else was really agreed upon.

THIS probably seems like quibbling over words, but to use words so plainly and fully as to show just what is intended, without having any chance for fraud, misunderstanding or mistake, is the very soul of contract-writing; and many millions of dollars are spent every year in litigation, simply because the parties were not careful enough about the wording of their agreements. Taking up, however, the substance of the document, we do not find ourselves much consoled for the defects which appear to us in its form. The

very first clause says that the contractor is to "execute and complete the works shown upon the said drawings and described in the said specification." We have already described at length the objections to this phrase, which only requires the contractor to do the very small part of the work of building a house which can be shown on drawings and described in the specification in such a way as to satisfy a prejudiced jury that it is really and distinctly indicated—not implied, in both. The best builders here reject the similar clause in the official American contract, and, in their proposals, offer, not to do work shown in the drawings and specifications, but to build the building which forms the subject of the contract, according to the drawings and specifications; and most of our architects, in their contracts, use this expression, instead of the official form. As an example of the way in which the meaner class of builders interpret a contract of this sort, it is related that a contractor in Massachusetts, not long ago, refused to make any openings into the chimney-flues in a house he had been building, unless he were paid extra for doing so. There were, in the contract drawings, no plans, elevations and sections of the stove-pipe holes, and the description of them in the specification availed nothing with a contract which, like the official American and the Royal Institute form, did not require him to do work shown on the drawings or described in the specifications, but only such work as was shown or described in both. Architects can best appreciate the proportion of the total work involved in the construction of a house that it is possible to show and describe simultaneously by specifications and drawings, and the English members of the profession should find food for reflection in the thought that this proportion is all that the contractor is bound to do under the new form of agreement.

BUT it is in the third clause that we find the most astonishing stipulation. Here it is recited that "The term 'the Architect' in the said Conditions shall mean the said Blank, or, in the event of his death, or ceasing to be the Architect for the purpose of this contract, such other person as shall be nominated for that purpose by the Employer, not being a person to whom the Contractor shall object, for reasons considered to be sufficient by the Arbitrator mentioned in the said Conditions." Thus it appears that, in case of the death or dismissal of the architect of an important building, it is the contractor and the arbitrator who together dictate to the owners the appointment of his successor. We doubt very much whether any American owner would submit to such a limitation of his discretion in the choice of a professional adviser. It is true that, as the original architect is agreed to by both parties to the contract, it is only fair that his successor should also be acceptable to both; but the consequences of stopping proceedings on an important building, to haggle, perhaps for months, over the appointment of a new architect, might be ruinous to the owners.

DR. LILIENTHAL, whose attempts at flying, with artificial wings, have made his name known throughout the civilized world, recently invited the Berlin Society of Architects to witness some of his experiments. A large company of members, with ladies, accordingly proceeded to Lichterfelde, where Dr. Lilienthal has made, in the neighborhood of the brick-yards of the Lichterfelder Bauverein, a mound of sand, about fifty feet high, which serves him as a starting-point for his aerial excursions. The experimenter brought with him two pairs of wings. One, intended for voyaging in still weather, comprises a pair of wings, of ten metres spread, or about thirty-three feet, made of a frame of reeds, covered with cotton shirting. The body of the aeronaut is inserted through a hole in the frame, the arms extending over the wings, with cushions under the shoulders; and buckles and straps, with a pair of light wooden stirrups, give control of different points of the frame. The front portion of the wings is connected to the body by rubber bands, so that it can flap slightly, this being intended to prevent the navigator from alighting on his head. Projecting to the rear is a rudder, with both vertical and horizontal blades.

DR. LILIENTHAL began his proceedings by putting on his fair-weather wings, and, ascending to the top of the sand-hill, he jumped off. Something, however, was wrong about the apparatus, and in a moment he landed prostrate on

the ground. Fortunately, he was not injured, and, taking off the unfaithful wings, he put on a second pair, which is in construction similar to the others, but of smaller spread, being destined for windy days. With this apparatus he essayed a second flight, with success, passing over the heads of the spectators, and landing safely on his feet a little beyond the foot of the hill. The spread of these wings was insufficient, in a still day, to sustain him for a long flight, but, as the *Deutsche Bauzeitung* informs us, with suitable apparatus he is able to fly three hundred feet or more. This is quite different from the flights of a mile, at an elevation of two hundred feet above the ground, of which the daily newspapers occasionally talk; but it is just as much to Dr. Lilienthal's credit to have devised means for flying a hundred metres as a thousand. In fact, it should be understood that Dr. Lilienthal has no idea of fitting out people to fly, like birds, by means of their own muscles. His experiments are undertaken solely to learn the conditions of atmospheric buoyancy, and resistance to impact, and he has chosen an extremely efficient mode of instructing himself on these points.

A NEW idea for improving the comfort of railway travellers has been produced by the French Minister of Public Works, who seems, for an official, to have an extraordinary sympathy with the feelings of his fellow-men. As *La Construction Moderne* says, every traveller has observed the disputes about seats which frequently arise in railway-cars. If a traveller, who has by coming early to the station secured a good seat, alights at some frontier or refreshment station, he is very likely to find, when he comes back, that some one else has appropriated his place. Even if he puts a bag or some other piece of property in his place, to show that it is taken, he often finds that this has been coolly removed, to make room for the usurper. There is a certain justification for this, in the fact that many people, especially the English, as our contemporary informs us, are in the habit of piling their baggage on all the seats around them, so that, after the train has started, they may find themselves alone in their compartment; but it is the modest and scrupulous traveller who suffers most from impositions of both these sorts. In order to avoid at once the monopolizing of a number of seats by any individual, and the appropriation of places by people not entitled to them, with the scenes which occasionally result from this appropriation, the Minister of Public Works suggests that railway employes should be provided with pins, each carrying a strip of cloth; and that when a passenger is shown to a seat, the pin should be inserted in the cushioned back of the seat, to indicate that the place is occupied. This would show at once to people looking for seats in a train how many places had been taken, and where there was a vacant one that they could claim. It is evident that an unscrupulous person might take out the pin, and pretend that he found the seat unmarked, but the Minister proposes that a fine of twenty dollars should be imposed for meddling with marks of this sort, and a few arrests would probably check the practice. An arrangement of this sort would certainly add greatly to the comfort of travellers on the Continent. Whether it could be adopted here is another question. With us, after a passenger's money is safely lodged in the cash-box of the ticket-office, all regard for his comfort ceases, and the grumpy permission to hunt up a seat for himself, or, if he cannot find one, to stand, is the most that he can venture to expect. However, if he cannot have a railway servant to secure his place for him, it might perhaps be possible to enable him to secure it for himself. If, at the ticket-office, decorated pins or tags could be bought for a few cents, which might be attached to the purchaser's seat in the train, to reserve it in his absence, travellers would be enabled to enjoy a great deal of rest and change, by leaving the cars for a moment at stations, that they cannot get now, except at the risk of losing their seats. It might be made by statute a misdemeanor to remove one of these marks, and it should also be made one to attach a mark to one seat in the train, and occupy, or similarly mark, another seat. Then the abuse so frequently seen here, where a man fills up two seats in an ordinary car with his baggage, and then sprawls over two more seats in the smoking-car, thus claiming four seats for himself in a train where, frequently, other passengers, too scrupulous to take a seat which they suppose to be engaged, are standing, would be put an end to, much to the advantage of travellers, as well as of the railway companies.

ELECTRICAL SCIENCE FOR ARCHITECTS.¹—XIV.

THE NATIONAL CODE OF RULES FOR ELECTRIC WIRING.—VII.

27. FIXTURE WORK:—

a. In all cases where conductors are concealed within or attached to gas-fixtures, the latter must be insulated from the gas-pipe system of the building by means of approved joints. The insulating material used in such joints must be of a substance not affected by gas, and that will not shrink or crack by variation in temperature. Insulating joints with soft rubber in their construction will not be approved.

[Section a. Insulating joints to be approved must be entirely made of material that will resist the action of illuminating gases, and will not give way or soften under the heat of an ordinary gas-flame. They shall be so arranged that a deposit of moisture will not destroy the insulating effect, and shall have an insulating resistance of 250,000 ohms between the gas-pipe attachments, and be sufficiently strong to resist the strain they will be liable to in attachment.]

b. Supply-conductors and especially the splices to fixture wires, must be kept clear of the grounded part of gas-pipes, and where shells are used the latter must be constructed in a manner affording sufficient area to allow this requirement.

c. When fixtures are wired outside, the conductors must be so secured as not to be cut or abraded by the pressure of the fastenings or motion of the fixture.

d. All conductors for fixture-work must have a waterproof insulation that is durable and not easily abraded, and must not in any case be smaller than No. 18 B. & S., No. 20 B. W. G., No. 2 E. S. G.

e. All burrs or fins must be removed before the conductors are drawn into a fixture.

f. The tendency to condensation within the pipes should be guarded against by sealing the upper end of the fixture.

g. No combination fixture in which the conductors are concealed in a space less than one-fourth inch between the inside pipe and the outside casing will be approved.

h. Each fixture must be tested for "contacts" between conductors and fixtures, for "short circuits" and for ground-connections before the fixture is connected to its supply-conductors.

i. Ceiling-blocks of fixtures should be made of insulating material; if not, the wires in passing through the plate must be surrounded with hard-rubber tubing.

There are numerous opportunities for trouble in the wiring about gas-fixtures. The fixtures themselves are of metal, and the wires must necessarily be run in confined spaces and close to this metal; the gas-pipe system forms a conducting net-work throughout a building and has good connection with the earth; any defect that causes an arc is apt to burn through the gas-pipe, ignite the gas and immediately start a dangerous blaze.

The greatest danger of accidental connection is between wires and the fixtures, and consequently it is required that the fixture be joined to the gas-pipe system by means of an insulating joint. Figure 64 shows one form. This insulating-joint allows the gas to pass through, but insulates the fixture so that in case a wire were to become electrically connected with it, a connection somewhere else in the building, such as between the other wire of the circuit and a fixture, would not cause a flow of current through the gas-pipe system. Were this to occur, there would be a short-circuit with a heavy flow of current, and an arc would be formed at the points of contact that would quickly burn through the pipe. By insulating the fixture entirely, to cause a short-circuit it is necessary that two accidental connections on the same fixture should occur, and these two connections must be on opposite sides of the circuit—one connection for each wire or pole.

Figure 65 illustrates the effect of having no insulating joints. If, for instance, the wire C coming from the A wire of the circuit were to have connection with the fixture at E, and the wire D coming

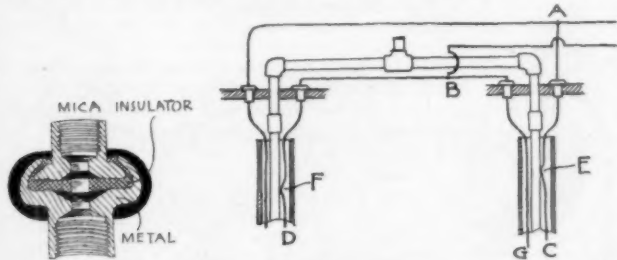


Fig. 64. Section of Insulating-Joint.

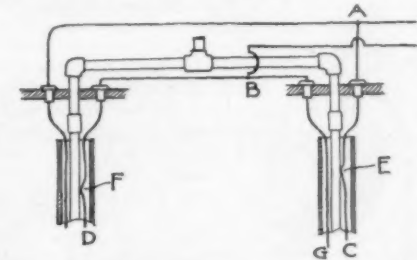


Fig. 65. Showing Circuits on Fixtures not provided with Insulating-Joints.

from the B wire of the circuit were to have connection with any one of the numerous fixtures of the building as at F, then a heavy current would immediately flow from A through C, thence to the fixture and gas-pipe at E, through the gas-pipe system and other fixture to F,

¹Continued from No. 1023, page 49.

through the fixture wire D to B, the other side of the circuit. If there were insulating-joints in these gas-fixtures, as in Figure 66, two connections like those supposed could not cause a short-circuit, because there would be no path from F to E through the gas-pipe, as the current could not pass the insulation in the joints. To cause trouble it would be necessary to have not only the connection at E, for instance, but another connection with the same fixture somewhere along the wire G. The insulating-joints by cutting off each fixture by itself reduce greatly the probability of trouble.

Rule 27 (a) and the accompanying note specify in detail the standard that must be reached by an insulating-joint and incidentally suggest the many ways in which a joint may be dangerously defective. The underwriters furnish lists of the insulating-joints that have been tested and approved.

There is an opportunity for careless work at the tops of fixtures where the supply conductors (Fig. 66) come through the ceiling to be attached to the fixture wires. These supply-

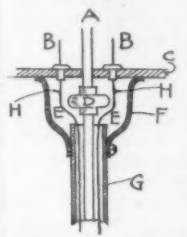


Fig. 66. A. Gas-pipe; B. Supply-conductors; C. Ceiling; D. Insulating-Joint; E. Fixture Wires; F. Shell; G. Outer Casing of Fixture; H. Splices.

wires are brought down close to the gas-pipe to which the fixture is attached and should, as Rule 27 (a) requires, be kept carefully away from the part of the gas-pipe system that is connected with the ground. Shells (Fig. 66) are ordinarily used, and as these cover up the work there is less inducement for the workmen to do the work carefully, even when the shell is large enough to take the wires and splices without crowding.

Burrs and fins are the sharp edges left when the sheet-metal composing the fixtures is cut. These, if left, will injure the insulating covering of the wire when it is drawn over them.

The upper ends of fixtures are usually sealed by wrapping tape [See remarks under Rule 12 (a)] about them until they are virtually airtight.

The gas-pipe running down through the fixtures is surrounded by a larger tube or casing, and between these the electric wires are run. If this space be too small for the wires to be drawn through easily, the insulation is apt to become abraded.

The testing required in Rule 27 (h) can of course be satisfactorily done only by those familiar with the work.

Fixtures are often fastened against a block that is attached to the ceiling. If this ceiling-block be not itself of a material suitable for bushings, there should be used a regular insulating bushing, such as would be used through the ceiling itself.

28. ARC-LIGHTS ON LOW-POTENTIAL CIRCUITS:—

a. Must be supplied by branch conductors not smaller than No. 12 B. & S. gauge.

b. Must be connected with main conductors only through double-pole cut-outs.

c. Must only be furnished with such resistances or regulators as are enclosed in non-combustible material, such resistances being treated as stoves.

Incandescent-lamps must not be used for resistance devices.

d. Must be supplied with globes and protected as in the case of arc-lights on high-potential circuits.

Arc-lights are often run from the same circuit that supplies incandescent-lamps, by connecting two in series between the two wires of the circuit (Fig. 20). Each lamp takes from 50 to 55 volts and the two can therefore be operated by 110 volts of the low-potential circuit. It has been remarked that with a regular series-circuit the dynamo is so regulated that it maintains a constant current. The circuit operating incandescent-lamps being at a constant pressure, it is necessary to have with the arc-lamps resistances that will be cut in or cut out automatically as the resistance of the arc-lamps decreases or rises with the feeding and burning of the carbons. From remarks under Rule 12 (b) it will be understood why fuses cannot be used with a constant-current circuit, but they should be used with a constant-pressure circuit, and each circuit of arc-lamps on an incandescent circuit should have double-pole cut-outs with fuses, just as incandescent-lamps or motors would.

The resistances used with arc lamps heat as any resistance does when a current is forced through it, and when the lamps get badly out of order the resistances sometimes become greatly overheated. As the rules state, it is necessary to install these resistances only in such places and in such ways as would be proper if they were small stoves.

Incandescent-lamps have a definite amount of resistance in their filaments and they are made to stand considerable current for their size, so that they make convenient resistance devices. They are poor for this purpose, however, for if any of the lamps burn out, it may upset the balance and cause excessive current as in multiple-series or series-multiple systems of lighting. [See remarks under Rule 14 (c).]

29. ELECTRIC GAS-LIGHTING:—

Where electric gas-lighting is to be used on the same fixture with the electric-light—

a. No part of the gas-piping or fixture shall be in electrical connection with the gas-lighting circuit.

b. The wires used with the fixtures must have a non-inflammable insulation, or, where concealed between the pipe and shell of the fixture, the insulation must be such as required for fixture wiring for the electric light.

c. The whole installation must test free from "grounds."

d. The two installations must test perfectly free from connection with each other.

The lighting of gas by electricity requires only battery power of low electrical pressure, and neither the insulation on the wire nor the method of construction need be nearly so good for satisfactory operation as must be the electric-light wiring. Often the gas-pipes are made to serve as one wire of the gas-lighting circuit. Connection between the gas-lighting system and the electric-light system exposes the inferior insulation to the comparatively high pressure of the light system and such cross connections can cause serious damage. Accordingly where the two systems are used together on the same fixture, it is required that the standard of the gas-lighting wiring be raised virtually to that required for the lighting wiring.

30. SOCKETS:—

a. No portion of the lamp socket exposed to contact with outside objects must be allowed to come into electrical contact with either of the conductors.

b. In rooms where inflammable gases may exist, or where the atmosphere is damp, the incandescent-lamp and socket should be inclosed in a vapor-tight globe.

The socket (Figs. 67 and 68) is the brass receptacle into which the lamp itself is fastened. One terminal of the lamp filament is attached to the brass band about the lamp base and the other terminal of the filament is attached to the smaller brass piece coming out of the centre of the lamp base. The wires are brought into the socket and attached to terminals that are so arranged that when the lamp is fastened in the socket each end of the filament is in electrical connection with one of the two wires of the circuit.



Fig. 67. Keyless Socket.



Fig. 68. Key Socket.

The space within the socket is small and while there is room for the conductors to enter and to be attached to the socket terminals, carelessness in making the connections is apt to leave projecting one or more fine wires making up the conductor, so that it is free to come into contact with the socket.

There is considerable likelihood of short-circuits in sockets, and while the fuses allow an excessive current to last only momentarily, if there were inflammable gas present even the very short flash would be sufficient to ignite the gas. Where the atmosphere is damp, short-circuits in the sockets are apt to be numerous and while there is a probability that the fuses will take care of these, it is poor practice to depend upon safety-devices when the trouble may be prevented. Vapor-tight globes (Fig. 69) cover both the lamp and the socket and are an effectual protection. It is well to use them when fine dust accumulates about the socket and the attached conductors.

31. FLEXIBLE CORD:—

a. Must be made of conductors, each surrounded with a moisture-proof and a non-inflammable layer, and further insulated from each other by a mechanical separator of carbonized material. Each of these conductors must be composed of several strands.

b. Must not sustain more than one light not exceeding 50 candle-power.

c. Must not be used except for pendants, wiring of fixtures and portable lamps or motors.

d. Must not be used in show windows.

e. Must be protected by insulating bushings where the cord enters the socket. The ends of the cord must be taped to prevent fraying of the covering.

f. Must be so suspended that the entire weight of the socket and lamp will be borne by knots under the bushing in the socket, and above the point where the cord comes through the ceiling-block or rosette, in order that the strain may be taken from the joints and binding screws.

g. Must be equipped with keyless sockets as far as practicable, and be controlled by wall switches.

Flexible cord is the name given to the species of twin wire that is formed by twisting two stranded conductors covered with insulation about each other so that they make one cord or piece. It is much used for pendant lamps and for portable lamps and motors, but its convenience tempts one to use it in many places for which it is not at all suitable. Since the conductors forming the two sides of the circuit are twisted close together, it takes very little abrasion or injury to the insulating covering to make a connection between these two conductors and thus form a short-circuit. In addition to the usual dangers of short-circuits, the silk or cotton braid covering the wires is apt to take fire from the flash.

The rules require that each conductor of flexible cord be made up of several strands, because if a solid conductor be moved about as if it were perfectly flexible, it will sooner or later break off and cause trouble. Each conductor is to be surrounded by a non-inflammable layer to preserve the insulation in case of overheating, and there is

also to be a moisture-proof layer of insulation so that accidental moistening will not cause a short-circuit. The wires being also separated by a carbonizable material, if bad leakage do occur this carbonizable separator will become a good conductor, will help the passage of a heavy current, and so quickly cause the melting of a fuse and the stoppage of further current. The two insulating layers are required so that liability of leakage between the wires may be reduced to a minimum, but when leakage does occur it is thought better to have it cause a short-circuit immediately and blow the fuse.

Flexible cord is not intended to sustain weights and the rules limit the weight that may be suspended, to one incandescent-lamp not exceeding in size a 50 candle-power lamp.

Flexible cord is not allowed in show-windows even for pendants. There is always liability of its short-circuiting and thus causing at least a momentary blaze and perhaps a scattering of particles of molten metal. With the inflammable material usually present in show-windows, these short-circuits that might amount to little elsewhere, may here quickly start a fire.

Where the cord enters the socket there is gradual wear of the insulation by abrasion unless the hole be bushed with an insulating bushing (Fig. 70). When the insulation is scraped from the ends of the conductors so that they may be connected to the terminals in the socket, the outside braid is apt to become frayed. These light ends are inflammable and would quickly catch fire from a small arc in the socket. It is accordingly required that the ends of the conductors be wound with tape to bind down the loose covering.



Fig. 69. Vapor-tight Globe to cover Lamp and Socket.



Fig. 70. Insulating Bushing for Socket.

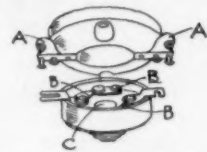


Fig. 71. Ceiling-block or Rosette: A. Connections for Supply Conductors; B. Fuses; C. Hole for Flexible-cord, against the sides of which the Knot bears; D. Binding-screw for Cord.

If a cord pull directly from the binding screws holding it in the socket or in the ceiling-block or rosette (Fig. 71), the strands are apt to pull out from under the screws and either leave too few strands to carry the current safely, or leave loose ones to fly against the other wire of the circuit and cause an arc. The holes in the socket bushing and in the rosette are little more than enough to allow the cord to slide through them and by tying a knot in the cord after it has passed through these holes, the knot comes against the walls of the holes and relieves the binding screws of any strain.

Every socket that has a key for turning the light on and off, has virtually a switch within it that draws a slight arc when it operates, and that is liable to get out of order. It is well to get rid of these small switches as much as possible and so reduce the chances of trouble. With keyless sockets (Fig. 67) the connections are permanently made and several lights are turned on and off by one switch on the wall or in a switch closet. This switch is larger than the socket switches and as there is not so limited a space in which the parts must be assembled, they are less likely to get out of order.

Decorative "series" lamps would never be operated on a pure series circuit, but would be operated on a multiple-series system, strings of lamps being connected in between the wires of a constant-pressure circuit (Fig. 45). Rule 14 (c) prohibits any system of series-multiple or multiple-series lighting for incandescent-lamps, but the rule applies only to circuits of 300 volts or over. The reasons for this rule will apply with more or less force to all series-multiple and multiple-series lighting, and the danger is considerably increased with decorative lamps because they are usually surrounded by inflammable material.

RUSSELL ROBB.

(To be continued.)



THE WORLD'S FAIR RUINS AT JACKSON PARK.—THE ART BUILDING.—THE GERMAN PAVILION.—THE MIDWAY CANAL.—CHICAGO UNIVERSITY BUILDINGS.—OFFICE-WORK STILL DULL.—THE ARCHITECT OF THE NEW POST-OFFICE STILL UNSELECTED.—HOLMES'S CASTLE.

IF, after some fifty or a hundred years of life in the New Jerusalem, one could be permitted to return to the scenes of former life, and should find that in spite of most cherished memories of bright and happy surroundings all had changed and that most of the beloved objects had vanished, which in memory had appeared beautiful by the side of even heaven itself, one would experience a little of

the sensation felt in revisiting the site of the World's Fair at Jackson Park. The man who could go there and shed tears must feel comparatively happy, in finding an expression for that awful sense of loneliness, depression and sorrow, that comes over one as he wanders over the site of the once beautiful creation. There is here and there just enough of some feature left to make you feel you have only to turn your eyes and all the rest will come. What does actually come is an involuntary sense of disappointment, such as a child must have when he bites on a china cherry, expecting that it is the natural delicacy.

One feature which strongly impresses itself on the visitor is the gigantic amount of work which there actually was in the World's Fair undertaking.

It is now nearly two years since the Exposition closed, and yet, with the exception of a comparatively small part in the northern end and the entire part of the Midway Plaisance, the utmost chaos still prevails. Evidently what was under ground was nearly as much as that seen above. The buildings are practically down, the huge central pavilion of the Government structure is now being worked upon, the Liberal Arts stands a heap of twisted and distorted iron-work owing to its fiery exit, and the girders of Machinery Hall are now hanging, many of them, midway between the earth and the springing arches which in part rise above them. If any one imagines that the buildings were simply and neatly removed, and the park stands comparatively as it was two years ago, he would find himself surprised on visiting the place. Not a road remains in good condition. They have all been torn up and in many places obliterated in removing water and sewer mains, electric-light wires, etc. What were once beautiful patches of greensward are now shapeless masses of lime, dust, hair and plaster, in which bits of tin and patches of pig-weed contend for a second place. Many of the bridges even have been taken down, for though perhaps strong enough in themselves, their abutments were only staff and boards, and are fast crumbling away. Much of the curbing bordering the ponds and lagoons, being of similar character, is fast approaching a like fate and many a massive pillar has its half lying prone on the ground, displaying to strangers its unsubstantial vitals. Gazing southward from near the site of the Government Building, a desolate stretch greets the eye. Steam dredging-machines fill with their gray smoke the air, which is already full of dust and dirt raised by hundreds of laborers and teams bringing in and taking away soil and rubbish. Through the smoke-laden atmosphere, the figure of the Republic rises dim among the ruins, now in white, all except the globe which she holds in her upstretched hand. Dim and spectre-like, two of the huge steers once in front of the Agriculture Building, toss their heads above the mass around them, while two cowering creatures, like beasts of prey around some ancient ruin, crouch among the fast-growing underbrush, where was once the bridge leading west from the Liberal Arts. Palmyra of the desert in her desolation could not have been more desolate, and the difficulties of restoring a ruined city become apparent.

Entering the park at the northern end, the former Art Palace, now the Fields Columbian Museum, looms up with its grand proportions. Time has not dealt gently with it in the two years that have passed since ninety-three, and in looking at its discolored walls and generally shabby appearance, you are at once glad that the other buildings went as they did, so that no untidy-ruin will mar their glorious remembrance. At the north of the Museum where all the State buildings clustered, all is clear and glaring—a long sweep of macadamized roads and grass. The ghostly form of Mackay's spectatorium has vanished, and the neat pavilion which Iowa incorporated into her building and was to leave intact when the building was removed stands fresh and jaunty on the beach. The Museum has been kept unchanged in most particulars in the interior as well as exterior, and "a feeling of sadness steals o'er one, which is almost akin to pain" on entering its once so well known halls.

Opposite the entrance, the German model of the Berlin Parliament House stands white and fresh before you, while a case of the reproductions of the old Celtic jewelry and sacred relics recalls the glories of one corner of the Manufactures Building. Much of interest is to be seen in the place, and doubtless much which as the years go on will be weeded out. Every few steps some familiar object brings to your mind that ever-to-be-remembered creation of ninety-three, and even a guardian in the fresh bright uniform of the Columbian Guard produces a sensation, and you murmur, "It was a dream. Oh, let me dream again."

The models of much of the World's Fair statuary are grouped in the central pavilion and are evidently most carefully guarded, as no one is allowed to wander among them, but must view them from the outside of the protecting cord. This collection will be one of a good deal of historical interest, and from an artistic standpoint of course has much worth. Near the Sixtieth-Street entrance to the park there are several little shops where casts of many of the architectural details of the Fair buildings, as well as many of the smaller figures are sold.

Passing down eastward from the Museum we reach the Lake Shore drive, which is now in good condition. Several things bring to the eye of memory the dream of two summers ago, indeed, so much so that we involuntarily search for the open pavilion of France, for the fascinating creation from Ceylon's spicy isle and the Victoria House. The "war ship," rather the worse not for war but wear of two stormy winters, still stands moored to the dock, and the German

Building in all its quaint picturesqueness rises among the willows. Now that all the rest of the distracting attractions are removed, this German Building is well worth a visit and a more than cursory glance, as a very good example of the special style of decoration which it represents. It is to be hoped it will be kept in repair, and indeed, that these repairs will be made before it is too late, for it even now shows sadly the effect of rain and weather. If such a thing is permissible in the park a more charming building than this could not be obtained for a refectory where the inner man could be refreshed of a summer evening in sight of the blue lake and to the sound of a German band. "Old Vienna" might come to life again here. All south of the German Building is hopeless, disheartening chaos, with the Convent of La Rabida rising on an island, all the bridges being down at the extreme south; but turning westward it is possible by wading through sand and staff to look across to the Wooded Island to where the Hooden Palace stands. Viewed from a distance, for the bridges are down which lead to the island, this seems to be in very good condition and to be bearing up well against the inroads of time. So completely is it shut off from the rest of the turmoil of the park, that it might well be the enchanted palace of some Japanese sleeping beauty. Mr. Olmsted, who has charge of the grounds, will no doubt bring beauty out of the chaos. Already his skill is shown in the admirable way in which he has treated the elevated tracks of the Illinois Central, Michigan Central and several other roads that run directly at the west of the park. A ridge has been formed against them and trees planted on it, which, although as yet very small, almost completely hide the railroad structure. To the east of this ridge begins the first series of basins, now simply sowed down with grass, which will at some future time be transformed into the canal which is to run through that stretch of park which constituted the Midway Plaisance. This strip is already in orderly shape, macadamized roads, closely-shaven lawns and hundreds of small elm trees constituting its only beauty. It will, however, as years go on and the trees reach some size, be a very beautiful boulevard, with its houses on either side, its canal in the centre and spreading trees above it all. Mr. Olmsted is evidently planning for the future, and his work with the minimum of help from Dame Nature promises to be as fine as that done by him at the Columbian Exposition.

Just north of what was once the Plaisance, as many remember, stand the buildings of the Chicago University. Mr. Rockefeller has just given another paltry million to this institution, making a still more elaborate outlay possible. The more recent buildings are the Walker Museum and the Physical Laboratory, both buildings, as are all the others in the group, in the English Gothic style. They are of buff Bedford stone with red-tile roofs, and though not absolutely of the purest type have the style generally well carried out, and are very pleasing. The most attractive structure, so far, is the Physical Laboratory, a long building with its central portion rising into a square battlemented tower, the lower stories of which contain the well-designed central entrance. One other good-sized building is now in process of construction and the group is fast assuming an individual character. Placed in less hopelessly ugly surroundings it might be much more effective than it is at present; for anything more dreary than the demoralized prairie on which it is situated would be hard to imagine. Most decidedly the landscape-gardener who works in this vicinity at the south of Chicago, must feel himself quite unhampered by any calls Nature may make upon him, as she has thrown out no hints of any beautiful possibilities. To the east of this section the Lake proves an attraction, and sand dunes and gnarled scrub-oaks were once a somewhat pleasing feature in this section, but the dunes and the oaks have about disappeared before the march of civilization, and a hopeless prairie rich only in tin-cans and pig-weed is what now remains.

Dulness in architectural circles seems to be the order of the day out here. All kinds of gossip is abroad relative to this and that complication in the different offices. These reports are rather difficult to sift down to their stratum of truth, and though the sheriff may not have been in possession of many or any of the offices, the actual truth of the matter is that in luxurious quarters, such as perhaps were warranted by work in prosperous times, many of the architects during this period of depression find themselves much hampered by an expensive corps of draughtsmen and large expensive office and draughting-rooms that they are unable to rid themselves of now that the times do not warrant such office expenditure. Though extremely dull now, architects are prophesying better times for the fall, as new building schemes are being talked of, and it would seem as if the height of the quiet season had been reached this summer. Another rumor current two weeks ago and which has since been substantiated is that of the withdrawal from the firm of Adler & Sullivan of Mr. Adler. The Crane Elevator Company, it seems, felt it would be to its advantage to have a man of such well-known reputation as Mr. Adler's for its special consulting architect and general manager of the sale department and, consequently, offered him a salary so large that it became a difficult task for him to refuse.

Another matter of somewhat personal interest and which we regret to note is the death of Mr. Karls, an architect of many years' practice, chiefly among the Germans of our city. Mr. Karls had for some time been much depressed and a few days ago shot himself in his office.

Perhaps dulness in summer work has forced into the race for a chance at the new post-office work many more architects than at first seemed inclined to join in it. A month ago there seemed but small

desire on the part of many to make any effort for the work, but now about thirty names have been sent in to Secretary Carlisle. At one time it was reported that Mr. Cobb was the man destined for the big undertaking and the community felt safe in hoping that he would make the building a creditable monument to himself, and consequently a structure that Chicago would not be ashamed of. Mr. Clinton J. Warren is just now reported as the man most likely to obtain the position. Mr. Warren is well acquainted with Chicago, above ground and below, and should he have charge of the building there will be no danger of a repetition of the last Federal failure in our city in a building continually settling, cracking and falling.

The work of excavation for the temporary post-office has actually been begun on the Lake Front and as the whole structure must be up and ready for occupancy in ten weeks, a large force of men is put onto the work. The building will be nearly five hundred feet long and over two hundred feet wide, the central one hundred and sixty feet being two stories, while the rest consists of a one-story construction. It will be used for four years and must necessarily be somewhat substantial in character. It will have a brick foundation, an iron framework, but farther than this will be of wood.

A curious architectural freak which was last month been brought to light is the house owned by H. H. Holmes, the supposed murderer and swindler, about whom the papers have been so full of late. An innocent and commonplace enough looking house from the exterior, it has in the interior proved to be a veritable Bluebeard's castle—

"Doors open into darkness unawares,
Mysterious passages and flights of stairs."

but here stops the likeness to the house of the venerable New Hampshire governor. The home of Holmes appeared to be on the second story of a building in part above a drug-store and various other small shops. It consists of a flat of twenty-two rooms, not counting six halls. Nearly every room has two exits, some more, and those with only one are unpleasantly suggestive, having no windows and being plentifully supplied with trap-doors. The place is such as might even daze a native Bostonian, educated in the intricate ways of the cow-paths of his native city and warranted not to turn up on Scollay Square more than a dozen times on the same morning unless he wanted to. If the house was planned to confuse intended victims and make their escape in a hasty retreat impossible, it has fulfilled its mission, while a man thoroughly acquainted with the place would be better able to avoid pursuit and capture here than in almost any other place. In this flat of twenty-two rooms there are five closets, two opening out of the same room, while one is built practically in the centre of one large room, making of it an ideal hide-and-seek place, especially as there are nine doors leading out of this room opening into various halls and large or small rooms, two of the doors leading into an apartment where two of the trap-doors are situated. This choice chamber is itself without windows.



MONTREAL, seven hundred miles inland from the Atlantic, is the principal port of the Dominion, the head of the ocean traffic, passenger and merchandise, and the base of the inland carrying trade. Situated on the St. Lawrence River, whose current is very rapid and whose course to the ocean is impeded by several rapids and islands, immense sums have been expended in the course of years and as the requirements of trade demanded in order to keep Montreal the port. The canals constructed to circumvent the rapids are works of no small importance, and the deepening of the steamer channel from time to time in the St. Lawrence itself has been a work of very great expense. Montreal, consequently, has extensive quays and wharfs, but great as is their present area they have for long been found insufficient, and structurally are in no way in keeping with the importance of the trade carried out upon them. Months ago improvements were projected and Government engineers were employed to report on the projects. It is only recently that the Minister of Public Works has given permission to the Montreal Harbor Commissioners to make public the report of these engineers. The report deals first with the demands of the Harbor Board, which asks that the Government afford it such assistance as will enable it to receive in addition to the one million dollars, which they are already authorized to raise, a further sum of three million dollars—the money to be applied as follows:

Two million dollars for the execution of the plan known as No. 6,

which has already received the formal sanction of the Government; one million dollars to build an inland basin, in the eastern part of the city; one million dollars to complete the basin at Windmill Point and other parts of the harbor not included in plan No. 6. The report continues: "The Harbor Commissioners in urging the expenditure of four millions point out that no public funds have hitherto been appropriated for the port of Montreal as for other ports, although the business transacted at Montreal consists very largely in the landing of goods either shipped to or exported from the West." Another million dollars will be contributed by the City towards the works. The Commissioners go on to say that they are of opinion that the Government should undertake the works as a matter of Dominion importance, and they suggest that a thorough survey of the river and shore should be made so that the best and cheapest plan may be prepared as a preliminary to this work of improvement. In a supplementary report, the Commissioners suggest a modification of the scheme to reduce the cost to two million dollars.

On the death of Sir John Thompson, late premier of the Dominion, who died at Windsor Castle a short time after an interview with the Queen, it was decided by the Dominion Government to have two paintings prepared, to commemorate as historical events two passages in the funeral ceremonies, which, owing to his death in England and his burial in Canada, extended over several weeks. One subject is to be the placing of a wreath by Her Majesty on the coffin, at the Castle—the other the transhipment of the coffin from the man-of-war to the tender in the harbor of Halifax, Nova Scotia. Mr. F. M. Bell-Smith was commissioned to paint both pictures and has just returned from England, where he has been accorded sittings by the Queen and all the persons present on the occasion at Windsor. The portraits will be about half life-size and the picture when completed will be hung in the Parliament House at Ottawa. Mr. Bell-Smith is a well-known Canadian artist.

The great drainage-canal of Chicago as it progresses towards completion is causing an immense amount of uneasiness in the minds of Canadians. It has been authoritatively stated that when complete, the canal will take away from the St. Lawrence 600,000 cubic feet of water per minute, and this seriously threatens the shipping interests of the St. Lawrence. It has yet to be ascertained by investigation whether there is any real foundation for the alarm, but the subject has been brought prominently before the inhabitants of the lands bordering upon the whole course of the great Canadian water-way, from the tidal-waters of the Gulf to the head of Lake Superior, by the unusual low-level of the waters and their continued sinking. The waters of Lake Ontario are at the present moment nearly three feet lower than at this time last year, and five feet lower than in August, 1892, and the water is still going down at the rate of an inch a day. Such a state of things is alarming, no doubt, and causes very much inconvenience to shipping, not to mention the water-supply of many places, and if to such an occurrence a further drain of 600,000 cubic feet per minute is added, we are afraid we shall have to import our drinking-water from the United States, and use up our vessels for kindling wood. The Chief Engineer of the Montreal Harbor Board has been sent to inspect the Chicago Canal and to report upon damage, if any, that is likely to be sustained by us, when the canal is opened. His report, naturally, is awaited with considerable interest.

A dry season in Canada is usually followed by an autumn of severe thunder-storms, and already reports appear of the damage done by lightning in various places. The manner in which lightning dealt with a house at North Bay, Ontario, in a storm on the night of August 6th, is interesting and instructive, as the course of the electric fluid can be clearly traced through its work of demolition. The lightning struck the chimney first, demolishing it and scattering brickwork through the roof into a bedroom below. Every breakable article in the room was smashed by the shock, and some clothing caught fire. The fluid descended to the room below, touching the gilt moulding to which the picture-frames were suspended. This moulding was burned along its whole length and the picture-frames destroyed; a plate-glass mirror in a sideboard was also broken to atoms before the lightning escaped from the room, which it finally did by bursting out the front wall, making a hole about 6 feet square. The whole of the front wall of the house was shaken out of the perpendicular, so much so that the joists resting in it were on the verge of falling. The rest of the house was tracked and shaken, and the whole place will have to be rebuilt. Another house near was struck at the same time but without any very serious results. At the village of St. Anne de Bellevue, near Montreal, a flash of lightning struck the telephone in the Clarendon Hotel. A tiny blue flame was seen to emerge from the telephone and jump across to a metallic frame hanging on the wall; the flame travelled along the four sides of the picture-frame, tearing off strips of metal in pieces, diagonally of about two inches long. Having completed the tour of the frame, the flame jumped back to the telephone and was conveyed to the earth by the ground-wire. Beyond the destruction of the telephone and picture-frame, no damage was done to the house.

The officials of the Patent office at Ottawa recently witnessed some experiments on a new "gas" which the patentee calls "aceylene" and by which he expects to eclipse all other lighting processes. Mr. Wilson, the inventor or discoverer, whichever it is proper to call him, generates the gas by pouring water on a substance he calls "carbide," of which lime is the principal component. The light

emitted is excessively brilliant and as "carbine" can be manufactured for about twenty dollars a ton, it is calculated that the price of this gas for domestic purposes would be fifty cents a thousand feet.

It really seems that the answer to the question as to what is the best material for roadways in cities is as far off as ever. Millions have been spent in the last decade on various patents, each one as it was invented being thought to be the pavement of the future. The old macadam roads were torn up to make way for "block" pavements, a simple and apparently primitive system which consists of short lengths of tree trunks set around on the sub-soil without other preparation than that of levelling and grading. One season was sufficient to prove that nothing was so unsuitable. Continual repairs were needed—and after the frosts of winter, whole sections would be burst up and in the thaws of spring would take to floating. Then asphalt was tried, and for five years it certainly seemed as if the right thing had been found. There are, of course, many kinds of asphalt for roadways, but the one adopted in so many places, though costly seemed to meet the requirements of a good solid roadway. It appears now that five years is about all that can be expected of this material; unevenness appeared on the surfaces soon after completion and a second winter produced alarming cracks. There are a few streets which have been laid for eight or ten years, and I believe the patentees of one kind guaranteed their material for ten years and this seems to resist the tendencies to crack although the surface does not wear evenly. The vibrations of the electric-car tracks it seems impossible to overcome, and where a "toothing" of stone is laid between the rails and the asphalt the injury to the asphalt is more severe. A great drawback to asphalt paving is the white, gritty dust, most destructive to the materials exposed to view in the shops, and as certain patentees object to water being poured on the roads to keep down the dust, the conclusion is reached that perfection has not yet been attained. Another disadvantage is the great heat of these roadways, the refraction being very oppressive, and while they get heated up in the day when exposed to the sun they give out at night a heat that in still weather is more than trying. What are we going to do next? Shall we retrace our steps and adopt again the macadam roads, laid in the best manner, or is there some new method of treating the asphalt that will at last give satisfaction?

HEATING WITH THE OPEN FIREPLACE.

DURING the past winter, when the "cold wave" destroyed oranges and frosted trees, the inhabitants of Florida suffered severely with the cold. Those who went from the North, where houses were heated thoroughly by modern methods, found in the South, nothing to keep out the cold but the open fireplace. And in the severe weather this was of little use, for, the more fuel burned, the stronger were the cold draughts created and the colder were the floors and walls. This disastrous cold in the South renews the inquiry—In what degree of external temperature can one rely upon the open fireplace as a sole means of heating, the amount of fuel consumed being of no consideration?

In heating with the open fire, radiant heat is the only part that is realized. Of the total amount of heat developed in the grate about 10 per cent is received in the room. Some writers place the percentage at 12 per cent, while Putnam's experiments show but 6 and 8 per cent realized. With the modern construction of fireplace, with the projection of the breast and mantel into the room, about 10 per cent is secured.

This 10 per cent of the full amount of heat generated has the task of keeping the room heated to the required temperature, say 70° Fahrenheit. But with the open grate, not only is the loss of heat through walls and windows to be repaired (as is the case with radiated heat from the direct steam or hot-water system), but the amount of air drawn in by the grate must also be heated. This air enters in volume equal to the amount passing up the flue of the fireplace; and it comes directly or indirectly from out of doors. It is this draught of incoming air that limits the degree of cold in which the open fire is of value, as a degree is reached below which the amount of heat required to warm the incoming air is more than the fire can supply, and the room is chilled, rather than warmed by the blazing fire.

In finding this temperature, we will take as example an ordinary southern fireplace, 24" wide, 30" high and 12" deep, with a flue 9" x 9", situated in a room 16' x 14' x 11', the longest side being exposed. Wood is used as fuel, burning, say, $\frac{1}{2}$ of a cord a month. This amount develops about 215,400 thermal units per hour. The draught of the flue, of average height, will be 20,000 cubic feet per hour. As it takes .0192 thermal unit to heat one cubic foot of air one degree Fahrenheit, and as but 10 per cent of the full amount of heat is realized, one wood fire can heat the incoming stream about 56° Fahrenheit.

But besides heating the air, there must be compensation for the loss of heat through the exposed wall. This 176 square feet exposure will require approximately $\frac{1}{3}$ as much heat as the incoming current—or $\frac{1}{3}$ the total amount of heat. This leaves us 21,540 less 5,385 thermal units, or 16,155 thermal units for the incoming air—showing that this can be heated about 42°. That is, to have the temperature of the room 70°, the external temperature cannot be lower than 28°.

If the draught is secured from adjoining rooms, the result for the entire house will be the same, or even worse, as it means that an open fire in some other part of the building has not only its own current to heat, but also that of the fireplace in question.

Variations in size, shape and projection of fireplace will give slightly different results, as will also a change in the flue itself. The draught varies also with external temperature (being stronger when the thermometer is lower) but general results are as shown. The freezing-point is, then, about the limit at which the open wood fire gives satisfactory heat. Coal gives better results, as the draught is less in proportion to the amount of heat thrown into the room. Patent grates also give far better results with wood, as they decrease, and in some cases entirely stop, the inflow of cold air.

There may be secured a fireplace that burns wood to better advantage, the draughts being decreased by using a smaller flue, but it is found that the fireplace will often smoke when the opening is partially closed.

If more than $\frac{1}{2}$ cord of wood be burned per month, the results are practically the same, as the draught is increased nearly in proportion to the heat generated, and a far larger percentage of heat is lost up the flue because of the rapid exhaust of the hot gases.

Nor can the draughts be checked by closing crevices through which the outdoor air enters, as in that case the fire cannot burn at all. In fact, there is a gain in heat when an opening from the outside is made directly in front of the fireplaces. These results vary so much, that this sketch is intended more to suggest, than to give definite data.

WILL WALTER JACKSON.

DANGEROUS STATE OF SALISBURY TOWER.

THE following is Sir Arthur Blomfield's report on the serious condition of Salisbury spire, or (to speak more correctly) of Salisbury tower, for, as will be seen by the report, the real failure is in the masonry of the tower; the spire, in itself, we believe, is in good condition, but the collapse of the tower would involve the ruin of the spire, the thrust of which is also partly the source of the danger. The report was communicated by the Dean of Salisbury to the London *Times* and has no doubt been seen by many of our readers, but it will be well to put it on record in our columns for future reference:—

"SALISBURY CATHEDRAL, June 29.

"During the progress of certain minor repairs in the central tower it became evident that something was seriously amiss with the upper part of the two western stair turrets which required investigation.

"A scaffold was accordingly erected round the northwest turret, from which a close and careful examination has been made, with the result that its state proves to be even worse than was feared.

"A good deal of the external stonework is split and fractured and is in so loose and unsafe a condition that no assurance can be given of security from some serious disaster which might at any time occur. Certain cracks which are observable internally, especially one in the base of the spire at this angle, though they are certainly not altogether new, show indications of a slight recent movement which would inevitably become dangerously aggravated by any considerable fall of portions of the external stonework.

"It is difficult to determine with certainty the precise cause of the present state of things in these turrets, but various adverse agencies have no doubt been gradually at work for many years past.

"Of these the principal are, first, the numerous iron bands, rods and ties, which have been introduced from time to time, many of them in the most injudicious manner.

"An attempt has been made to protect some of them with lead from wet and consequent corrosion, but this has in many places altogether failed and made matters worse rather than better. The next agents are wet and frost, which have gradually done much damage; and the third is to be found in the great thrust of the spire, which is continually active.

"Nothing can be done to lessen or modify this last element of danger, but it is imperative to render the angle-turrets, which receive so much of it, as sound and strong as they can be made.

"For this purpose any attempt at small repairs or patching would not only be useless, but positively dangerous. The work that is called for by the necessities of the case is emphatically not one of restoration, but of repair, which is absolutely essential for safety, and which to be effectual must be complete and thorough.

"The greatest care, caution and skill will be necessary in dealing with the damaged portions of both these turrets.

"I should recommend the completion of the northwest turret first, to be followed immediately by the repair of the corresponding one on the south side.

"It is impossible to give any accurate estimate of the cost of the work necessary to put these turrets in a sound and satisfactory state, but it will probably amount to about £5,000.

"ARTHUR W. BLOMFIELD, A. R. A."

The subject is likely to be of so much interest to our readers, and the problem of dealing with the weak angles of a tower with such a great superincumbent weight on it is such an awkward one, that Sir Arthur Blomfield has been asked if he can give any information as to the means it is proposed to adopt to put the tower in a state of security. He has replied in the following letter:—

"Dear Sir,—Referring to your inquiries as to my report on the state of the western angle-turrets of the central tower and spire of Salisbury

Cathedral, a point has not yet been reached when a detailed description of the *modus operandi* is possible.

"The present scaffolding was only erected to provide a means of closer examination than was possible in any other way at certain points, and it is quite sufficient for that purpose; but before anything more can be done, or the precise means of dealing with a difficult and complicated undertaking can be decided, this scaffold must be supplemented and made strong enough to receive such shoring, strutting and needling as may be found necessary. This preliminary will be the first thing which will occupy my attention.

"With regard to subsequent proceedings, all I can say with certainty at present is, that my endeavor will be to avoid the use of iron altogether.

"Wherever I find it possible I hope to remove the bars and plates which have done so much mischief in the past, and in future to rely on bonders and bonding courses of stone, which, if properly used and well joggled and doweled, are in every way much more satisfactory and reliable.

"You will, of course, understand that I do not refer to the great iron ties and bands of the tower below, but to numerous small rods, bands and plates which I believe to have been introduced in the upper part of the angle-turrets in the time of Bishop Sherlock, that is, about one hundred and fifty years ago.

"Faithfully yours, ARTHUR W. BLOMFIELD."

WALL TILES IN THE AZORES.

I DID not go to Ponta Delgada for the purpose of making art studies. Naturally enough, perhaps, I had never connected the Azores with art, and I went there, indeed, in the hope — if I may be pardoned the expression — of escaping it for a time. But I could not.

The interior decoration of the churches, which is the only art manifestation likely to be seen by the general tourist, does not, at first sight, offer anything remarkable. The general effect produced is that of tawdryness — much inharmonious coloring, much gilding, paper flowers, sometimes in profusion, disposed around the altars, etc. The pictures, which, of course, are the principal things a stranger looks for, are also, as a rule, mediocre and less than mediocre. But upon closer investigation one finds, after all, a good many things to interest one. First of all, there are the tiles, sometimes to be seen on the outer walls of the churches, but very generally on the inner walls, — some few said to be of old origin, like those of the *Mai de Deus*; most of them, however, probably of the eighteenth century, but nevertheless interesting, and often not merely ornamental, but representing vast landscapes with groups of figures in them, as a rule in simple blue and white, but sometimes with ornamental borders into which yellow and violet have been introduced. The most interesting tiles of this kind which I noted are those in the main chapel of S. Francisco, at Ponta Delgada: on the northern wall the birth of the saint, on the south wall his stigmatization, both with landscape backgrounds of considerable importance. Very interesting also is an octagon chapel in the same church, entirely lined with tiles said to be of Italian origin: in the dado the entombment and the tomb of Christ, on the walls the four evangelists and four angels with the instruments of the Passion, over the door Moses and the brazen serpent. A dado of similar tiles is to be seen in the sacristy of the Matriz, curious especially for its subjects, which are representations of hunting-scenes, said to be of Portuguese origin. Unfortunately, many of these things are going to ruin, especially those in the extinct convents, and the churches belonging to them, which have been assigned to other uses. Thus the barracks of the sharpshooters quartered here are in an old convent, to which is attached a church, now disused, dedicated to St. John. The decorative tiles from this church have been used in part in the quarters of the soldiers, the others, by order of Captain Chaves, who is one of the few people who care for such things, have been stored away. I obtained a few of these tiles, decorative, blue and yellow on a white ground, Portuguese of the beginning of the eighteenth century, which the Museum of Fine Arts can have, if it wants them.

Another feature in the churches is the carving in the altar-niches, perfect forests of ornamental leafage, here and there with angels or the heads of cherubim peeping out of it. It is to be regretted that these niches are mostly painted and gilded, which produces an unpleasant want of repose. The effect is better where gilding only has been employed. But the work of this kind can best be appreciated in the "Collegio" of the Jesuits, which contains not only the most elaborately carved, but also the largest of these niches. In this case, the church not having been finished when the Jesuits were expelled, the wood is still in its native state, only mellowed by age, thus presenting a warmth and a unity of effect which is entirely wanting in the painted and gilded examples. The church and convent are at present private property, and one of the members of the family owning them told me that they had intended to have the niche finished, that is to say, gilded and painted, but that some French gentlemen who had seen it, had strongly advised against this proceeding — a piece of advice which I heartily seconded.

Many of the painted statues and statuettes, forming either the principal features of the altars, or disposed at the sides, are also quite attractive and worthy of attention. Some of these are said to be of Italian origin, while others are Portuguese. A colored bas-relief of "The Death of St. Joseph," in the church of Sta. Barbara, is especially remarkable for its delicacy and sweetness. — S. R. Koehler in the *Boston Transcript*.

THE MECHANICAL TESTING-STATION AT CHARLOTTENBURG.

EVERYBODY has heard of the "Physikalisch-Technische Reichsanstalt," generally called Reichsanstalt simply, at Charlottenburg, near Berlin, to a certain extent the realization of Professor O. Lodge's desideratum of a national laboratory. The Reichsanstalt is popular amongst the manufacturers and purchasers of technical apparatus and articles, because they can have the articles tested by competent and impartial men at moderate charges. And it is held in high esteem by men of science, because there experiments can be carried on which may require a lifetime, the coöperation of several investigators, and the continued use of costly apparatus. An official testing-station is now to be found in every larger German town, in connection with its university or technical college. Some towns can boast of more than one technical college, and of more than one testing-station. Thus, Charlottenburg and Berlin possess, in addition to the Reichsanstalt, where Professor Fr. Kohlrausch has succeeded the great Helmholtz as president, and besides other institutions of this class, the Mechanisch Technische Versuchs-Anstalt, which has for some time been directed by Professor A. Martens.

This last institution is divided into four departments, each with its chief, all of which appear to be amply supplied with the requisite machinery and apparatus. The first department is devoted to the testing of metals, ropes, belts and also wood. The test-pieces which are not generally received of exact dimensions, can be prepared in the laboratories, their various strengths ascertained; they can be punched, planed, crushed, welded, cast, alloyed, etched in acid baths, microscopically examined and photographed, and polished sections or slices tested in reflected and transmitted light. For these latter purposes a micro-photographic apparatus has been designed and constructed by Professor Martens and Mr. Carl Zeiss, of Jena. Special arrangements have been made for long-continued and repeated bendings, stretchings, etc., of discs, wires, cables. In some tests, specimens of over 50 ft. length and 30 in. width can be dealt with; polished surfaces can be made in areas of several square feet. In the second department, building-materials are examined, natural and artificial stones, glass, wood, roof felting (a kind of paper is used in Germany as such), lime, cement, mortars, plasters and drain-pipes. There are appliances for continued heating and freezing, treating in the wet, and other means of imitating the effects of ordinary wear and tear. The question of cement-testing has long been recognized as one of public interest in Germany, and for some years already this mechanical testing-station at Charlottenburg has been acknowledged as the final arbitration court by the Government. For a complete cement test two tons of the material are required; weights of less than 20 lb. are not accepted even for ordinary experiments. The third department, shortly known as the paper department, inquires into paper, cardboard, canvas, tarpaulin, threads and textile fibres in general. It is particularly requested that specimens of paper should be packed between thick covers of cardboard in order to avoid creases and the pressure of the postmark. The fourth department deals with lubricants: Professor Martens is an authority on such matters.

All these testing-stations are under the superintendence of a Government board. Pamphlets are issued stating the way in which specimens should be selected, handled, packed, etc. They also give a summary of the various tests in use, and the charges made for these. The Charlottenburg list of tests comprises 419 numbers. Clients have to say, when submitting their specimens, what they wish to be done. If in doubt about the best way in which to obtain their aims, they are advised to communicate with the director. By request, experiments are conducted on the special lines desired; the certificate issued in such a case contains a notification to this effect. Prepayment is the general rule. For investigations which will occupy a long time a deposit is demanded, and a discount varying from 10 to 20 per cent allowed. The same facilities are offered to firms which frequently consult the testing-station. The chemical laboratory in the Invalidenstrasse, Berlin, which is connected with the Mining Academy of Berlin, makes a speciality of ink and fuel testing, besides undertaking general analyses, more particularly of inorganic substances. Since 1883 the supervision board of the Prussian testing-stations has published "*Mittheilungen*," on the work done and the experience gained. These journals contain valuable information, and the apparatus which are originated in these laboratories can be freely copied. — *Engineering*.



MECHANICS' LIENS AND MORTGAGES.

A PARTY taking a mortgage on real estate is bound at the time to know whether material has been furnished or labor performed in the erection, reparation, or removal of improvements on the premises with the time fixed by statute for the filing of liens to perfect laborers', contractors' and material-men's claims for such liens.

The lien of a mortgagee on real estate, taken while a building is in process of erection upon it, is subject to the claims of material-men and laborers for material already and thereafter furnished, and for

labor already and thereafter performed in the erection of such building, when the commencement of such furnishing of material or the commencement of the performance of such labor was prior to the record of such mortgage.

The taking of a mortgage upon the same property upon which the creditor claims a statutory lien may not displace the lien. The mortgage is regarded as a cumulative security, and the creditor may enforce either the lien or the mortgage. So also, the taking of collateral obligation of another person for the payment of the lien debt does not debar the lien-holder from claiming the security of his lien, unless the circumstances are such that an intention to waive the lien may be reasonably inferred.

We are aware that it has been held that, if the party take a mortgage upon the same property upon which the statutory lien is claimed, it is a waiver of the lien, or if it has been perfected by filing, etc., will displace it. But in the decisions in which the rule is so announced, the reason given or shown by the facts of the case for the doctrine was that other lien-holders had become such by relying upon the record as showing the relations of the other parties, and to permit the mechanic or material-man who had taken the mortgage to assert the right to the statutory lien would prejudice the rights so acquired.

It is a general principle of law that a creditor may have as many securities for his debt as he can obtain without infringing upon the rights of others, and the rights of others cannot be affected by the fact that a party claims also a vendor's lien for material or machinery supplied for use of a building, as well as a mechanic's lien for the same debt.

[Chapman vs. Brewer (Supreme Ct. Neb.), 62 N. W. Rep. 320.]

MECHANICS' LIEN IN NEW YORK.

UNDER the laws of New York, 1885, Chapt. 342, Sect. 5, providing that mechanics' liens shall be preferred to any conveyance, judgment, or other claim which was not docketed or recorded at the time of filing the notice of lien, a lien filed after the death of the owner for work done before his death does not attach to the interest of the owner's devisees.

The Court said: No provision is found in the statute giving the claimant the right to acquire a lien after the death of the owner. Mechanics' liens are created by statute, and while the law should receive a liberal construction, so as to secure the beneficial purpose had in view by the Legislature, yet, as it creates a remedy unknown to the common law, it may not be extended to cases not fairly within the general scope and purview of the statute.

[Turbridge vs. Wright (Ct. of Appeals), 39 N. E. Rep. 640.]

MECHANICS' LIENS.

WHERE it appeared, in an action to foreclose a lien on property owned by husband and wife, that the title was in the name of the husband only, and that knowledge of the fact that he had a wife was not brought home to the lien-holder, it was not error to render judgment to the latter, although the notice omitted the name of the wife.

[Wash. Rock-Plaster Co. vs. Johnson (Supreme Ct. Wash.), 39 Pacific Rep. 115.]

SUFFICIENCY OF NOTICE OF LIEN.

As against the owner of property upon which a building has been erected, a lien notice sufficiently alleges ownership although it erroneously states that he has an equitable title, and that the legal title is in some one else.

A description of the property, as a certain brick building, giving the dimensions, etc., located on such a street, describing the lot, in a certain city, etc., is sufficient, although it is not in the "addition" named.

[McHugh vs. Slack (Supreme Ct. Wash.), 39 Pacific Rep. 674.]

ENFORCEMENT OF MECHANIC'S LIEN.

WHERE the purchaser of land on which there is a mechanic's lien agrees to pay it off and save his grantor harmless as to same, the lien may be enforced against the land in the hands of the purchaser, without first exhausting the lienor's remedy against the grantor.

[Cullers vs. First National Bank (Ct. Civ. App. Tex.), 29 S. W. Rep. 72.]

KNOWLEDGE NOT CONTRACT NECESSARY TO A LIEN.

THE Common Pleas Court of New York City holds that where work is done and materials furnished for a building with the knowledge and consent of the owner, a lien may be obtained for same, although the party claiming it made no contract with the owner.

[Marshall vs. Cohen, 32 N. Y. S. Rep. 283.]

NECESSARY PARTIES TO ESTABLISH LIEN.

IN an action by a laborer employed by a sub-contractor to enforce a mechanic's lien, the contractor, if service can be had on him, is a necessary party.

[Union Pac. Ry. Co. vs. Davidson (Supreme Ct. Colo.), 39 Pacific Rep. 1085.]

PRIORITIES OF MECHANIC'S LIEN.

UPON a full compliance with the statutory requirements, the lien of one who furnishes materials for the erection of a dwelling-house upon land previously mortgaged attaches to such building in preference to the mortgage, and under proceedings to enforce such lien, the purchaser of the building at foreclosure sale may remove the same within a reasonable time thereafter.

[Laird-Norton Co. vs. Herker (Supreme Ct. So. Dak.), 62 N. W. Rep. 104.]

EQUITABLE LIEN FOR BUILDING MATERIALS.

A CONTRACT for the purchase of materials to be used in the construction of a house, and notes given for the price, reserving title in the seller until payment, who is thus deprived of a lien under the statute, and also cut off from an action at law—until the notes are due, creates an equitable lien on the house and lot which may be enforced in a court of equity.

[Rose vs. Perry (Supreme Ct. Ala.), 16 So. Rep. 915.]

MECHANICS' LIENS—UNUSED MATERIALS.

THE title of building contractors to materials left on the premises on their abandoning the contract, because of the owner's breach, is not divested by a judgment in their favor assuming to give them a lien on such materials in an action in which, though they asserted a lien, they did not claim judgment for the price of such materials, but only for damages for the loss they were put to in purchasing them. As it belongs to them it could not be subject to a lien by their judgment.

[Porter & Blair Hdw. Co. vs. Lee (Supreme Ct. Ala.), 17 S. Rep. 217.]

RIGHT TO MECHANIC'S LIEN FOR IMPROVEMENTS.

WHERE a lease provides that the lessee may, at his own expense, alter and repair the building, one who makes the alterations under a contract with the lessee does the work "with the consent of the owner," within the statute providing who may acquire a mechanic's lien. Where improvements become part of a building, the fact that they were designed especially for the tenants' business will not affect the right of the person doing the work to a mechanic's lien. A provision in a lease that the lessee may repair and alter the building, does not give him the right to build a new sidewalk, so as to entitle one who, under contract with the lessee, builds the sidewalk, to acquire a mechanic's lien on the leased land.

[Mosher vs. Lewis (Common Pleas of N. Y. City and County, General Term), 31 N. Y. Sup. Rep. 433.]

RIGHTS OF SUB-CONTRACTORS TO LIEN.

SUB-CONTRACTORS being unable to complete their contract wrote the contractors a letter authorizing them to take charge of the work and "complete the same for our account" and that "we do not waive by this our rights under the original contract, for any extra work accruing from same." The Supreme Court, 2d Department of New York, held that the contractors by proceeding with the work, only assumed to finish it for the sub-contractors, and on completion, the cost was to be deducted from the contract price, before anything would become due to the sub-contractors to which a lien would attach.

[Brainard vs. Kings County, 32 N. Y. S. Rep. 311.]

ORDER BY CONTRACTOR AND MECHANIC'S LIENS.

AFTER a contractor had given a sub-contractor an order on the owner, he abandoned the contract, and the owner completed the building under a clause authorizing him to do so in default of the contractor, and to deduct the cost of completion from any moneys due the contractor. The order had been presented prior to the filing of any liens. And the Supreme Court, 1st Department of New York, held that such order was an assignment for so much of the balance due the contractor, after deducting for cost of completion, and was entitled to a preference over liens not filed until after its presentation.

[Murray vs. Micolino, 31 N. Y. S. Rep. 1109.]

FRAUD MAY PREVENT A LIEN FOR BALANCE OF CONTRACT PRICE.

WHERE a company agreed to build a factory for a certain sum, and a number of parties severally agreed to pay the amounts they individually subscribed, and some of them did so; but it appeared that those who had not paid their supposed subscriptions, either never signed the contract at all, or signed a piece of blank paper under fraudulent representations, so that they never became parties to it, the Supreme Court of Wisconsin held that the construction company was not entitled to a lien for the unpaid balance of the contract price.

[D. & R. Bldg. & Mfg. Co. vs. Cupp, 62 N. W. Rep. 520.]

SURETY ON CONTRACTOR'S BOND—RIGHT TO LIEN.

A SURETY on a contractor's bond to secure the owner against the

enforcement of liens cannot enforce against such owner, a lien growing out of his principal's contract.

[Spears vs. Lawrence (Supreme Ct. Wash.), 38 Pac. Rep. 1049.]

MECHANIC'S LIEN—BOND OF OWNER.

A BOND given by the owner of buildings upon which a notice of lien for materials and labor has been filed, conditioned for the payment of any judgment that may be rendered against the property, (as provided by the laws of New York, and some other States) takes the place of the property, and discharges and becomes the subject of the lien; and an action is maintainable upon the bond against all parties interested, including the sureties, without first foreclosing the lien upon the property.

[Morton vs. Tucker (Ct. App. N. Y.), 40 N. E. Rep. 3.]

HOMESTEAD SUBJECT TO MECHANIC'S LIEN.

A CONSTITUTIONAL provision that a homestead shall be liable for work and material used in improvements upon it, renders it liable to one who agreed to make the improvements, and made a contract with another party to actually do the work. A lien on a homestead for labor and materials for improvements may, also, be created by express contract.

[Walters vs. Texas B. & L. Ass'n (Ct. Civ. App. Tex.), 29 S. W. Rep. 51.]

MECHANIC'S LIEN FOR BUILDING ON LEASED LAND.

WHERE a contract to lease provides that the lessee shall erect a building on the premises, the lessor agreeing to pay the costs of such building by permitting him to retain the rents, the lessee erects the building as the agent of the lessor, so as to subject the interest of the lessor in the land to a mechanic's lien for labor and material furnished in the construction of such building.

[Kremer vs. Walton (Supreme Ct. Wash.), 39 Pac. Rep. 374.]

IDENTITY OF BUILDING UNDER MECHANIC'S CLAIM FOR LIEN.

A LIEN claim for material furnished for "a one-story refrigerating machine building and boiler house" is not at variance with proof that there were two buildings on the ground, where it is shown that they were so substantially connected as to make but one building, and that there could be no mistake as to the identity of the structure.

[Peterman vs. Mil. Brewing Co. (Supreme Ct. Wash.), 39 Pac. Rep. 452.]

PROPOSED FIREPROOFING TESTS.

THE important subject of the practical value of fireproofing is about to be investigated in a scientific manner by a committee appointed for that purpose; and it is expected that the results obtained will prove a valuable addition to our present knowledge.

Until now, all tests made have been undertaken in a more or less contracted manner, and, in most cases, simply to determine some special result. It is now proposed to carry out experiments on a large scale, and, among other things, to test the effect of an intense fire on the structural iron and steel so universally employed at the present time, and the effect that the different fireproofing materials may have in protecting the same.

The committee has been jointly selected by the fire-insurance companies, the architects and the engineers, and consists of Mr. S. A. Reed, representing the Tariff Association of New York; Mr. George L. Heins, the Architectural League of New York; and Messrs. H. de B. Parsons and Thomas F. Rowland, Jr., the American Society of Mechanical Engineers.

It may be stated in advance that the report of the committee is expected to contain some very valuable information. It is, therefore, hoped that not only the manufacturers of fireproofing materials, but also the public in general will offer their assistance, as the committee's expenses are to be met entirely by voluntary contributions.

The manufacturers of fireproofing materials are, however, not allowed to subscribe, but are asked simply to defray the expenses of erecting and removing their materials to be tested.

The Carnegie Steel Company, through their agent, Mr. Whitney, have kindly offered to give the committee all the iron and steel that may be required, and the Continental Iron Works have consented to give the ground necessary for the erection of the furnaces.

The time of the members of the committee is freely given to the advancement of scientific knowledge, and their names are sufficient to insure thoroughly impartial tests.

The committee has organized, and has commenced to build the required plant. There will be a gas producer to supply the fuel-gas, so arranged to receive a spray of petroleum in case higher temperatures may be required than those obtained from the combustion of the gas alone.

Furnaces for testing full-sized columns and floors will be erected. The foundations of these furnaces will consist of side walls with an arch between them, thus making a safe place for the introduction of the gas-pipes and for the hydraulic cylinder. On the top of this

foundation will be erected a room built of the materials to be tested. The columns will be loaded by pressure from the hydraulic cylinder, and, during the tests, a safe load, such as is prescribed by the building-laws of this city, will be put upon it. The arches for the floors will be loaded by dead weight. Every precaution will be taken by the committee to make the tests uniform as regards temperature, draught, cooling by water-streams, etc., so that the results may be comparable.

The committee will take minute notes of all details and publish them, together with the results, in its final report. The committee would be pleased to communicate with any one who may be interested in this matter. Its address is The Committee on Fireproofing Tests, Room 104, 22 William St., New York.



THE ANNUAL CONVENTION OF THE AMERICAN INSTITUTE OF ARCHITECTS.

THE Committee having in charge the arrangements for the Twenty-ninth Annual Convention of the American Institute of Architects to be held in this city on October 15th, 16th and 17th next, has finally agreed upon the following programme:

HEADQUARTERS AT ST. NICHOLAS HOTEL.

Tuesday, October 15th.—Sessions in the forenoon and afternoon.

Lunch at the hotel as guests of the St. Louis Chapter.

In the evening, formal reception at Museum of Fine Arts as guests of the St. Louis Architectural Club. Address of welcome by the Mayor of the city.

Wednesday, October 16th.—Session in the forenoon.

Lunch at hotel as guests of the St. Louis Chapter.

In the afternoon, carriage-drive through the residence portion of the city and the parks, and on the return, luncheon at the Columbian Club or Steam-boat excursion on the river.

In the evening, "Smoker" at the Mercantile Club.

Thursday, October 17th.—Session in the forenoon.

Lunch at hotel as guests of the St. Louis Chapter.

In the afternoon, visit to Anheuser-Busch Brewery, or prominent buildings in course of erection, or completed.

In the evening, theatre or Exposition.

A. F. ROSENHEIM,
Secretary and Chairman.



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

THE STATE LIBRARY: EXTENSION OF THE MASSACHUSETTS STATE-HOUSE, BOSTON, MASS.

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

A COMPETITIVE DESIGN FOR THE MINNESOTA STATE-HOUSE SUBMITTED IN THE FIRST COMPETITION BY MESSRS. C. W. & A. A. STOUGHTON, ARCHITECTS, NEW YORK, N. Y.

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[Additional Illustrations in the International Edition.]

REPRESENTATIVE CHAMBER: EXTENSION OF THE MASSACHUSETTS STATE-HOUSE, BOSTON, MASS. MR. CHARLES BRIGHAM, ARCHITECT, BOSTON, MASS.

[Gelatine Print.]

DALY'S THEATRE, CRANBOURNE STREET, LONDON, ENG. MR. SPENCER CHADWICK, ARCHITECT.

CENTRAL BAY, NORTH SIDE OF CHOIR, ST. SAVIOR'S CHURCH, SOUTHWARK, ENG.

FOUR HOUSES AT HARROW, ENG. MR. ARNOLD MITCHELL, ARCHITECT.

COMMUNICATIONS

[The editors cannot pay attention to demands of correspondents who forget to give their names and addresses as guaranty of good faith; nor do they hold themselves responsible for opinions expressed by their correspondents.]

EARLY BOSTON BUILDING.

SWAMPSCOTT, MASS., August 19, 1895.

TO THE EDITORS OF THE AMERICAN ARCHITECT:—

Dear Sirs,—You are right in praising the Boston building-law of 1679, passed in consequence of the great fire, which, on the 8th of August in the year named, destroyed seventy business buildings and eighty dwellings about State Street and Dock Square. But the first building-law applicable to Boston was passed in 1631, when in consequence of the first fire, at the South End, the use of all wood in the construction of chimneys and the use of all thatch for roofs was prohibited, which prohibition, we are told, was "readily assented to." Moreover, there is ample evidence to show that the law was duly enforced, aside from the fact that New England Puritans were not in the habit of using language in vain. As chimneys were well constructed, householders cleaned them occasionally by firing. This was prohibited in 1651, the selectmen being given full authority in the premises. In 1654 the town ordered Joseph Jenks, the famous inventor of the mowing machine, to build the first fire-engine in America. The building-law of 1631 justifies the belief that Colonial Boston had no thatch roofs, except those built before the town was six months old; and that the First Church, on the site of the present Brazer Building in State Street, had a roof of cedar shingles. It was certainly a substantial building, accommodating the congregation, the town-meeting, the law courts and the General Court. It was given up in 1639, I think, because more room was required for separate offices, the public records and for storage. When this first meeting-house was built, in August, 1632, the people knew that Boston would live; in 1639, they knew that Boston was the commercial metropolis of America, whose merchants had a world-wide reputation for ability and honesty. Their credit was nowhere questioned. All the world knew that in Boston, a town somewhere in America, men kept their engagements, being the only community where public and private opinion, the government and the governed were united in treating every trade and every transaction between man and man as involving three parties,—the buyer, who could rely on Puritan Boston; the seller, who scorned the rule of *caveat emptor* as infamous; and the living God, whose moral and commercial law was considered sure and swift as the law of gravitation. This spirit of Puritan Boston formed an epoch in commercial history. It was known in the West Indies, in Spain, in Holland, in London. It controlled every bit of building, engineering, or architecture in Colonial Boston—the only period in our history that treated all shams and all pretences as a violation of Divine law. Boston declined in the Province period, which controlled the eighteenth century.

Very truly yours, C. W. ERNST.

EXHIBITIONS

BOSTON, MASS.—*Summer Loan Exhibition; Gobelin Tapestries; Japanese Paintings; Line Engravings, Mezzotints, and Etchings by Rembrandt; at the Museum of Fine Arts.*

NEW YORK, N. Y.—*Twenty-eighth Semi-annual Exhibition; at the Metropolitan Museum of Art.*

Summer Charities Loan Exhibition; at the American Art Association Galleries.

NOTES AND CLIPPINGS

THE VALUE OF CITY QUIETUDE.—A railway company running into London, and establishing a new station at St. John's Wood, broke up the home of Jerome K. Jerome. He employed counsel and sued the Company for depriving him of a congenial haunt for a man of genius. The case was worked up well, W. S. Gilbert, I. Zangwill, Sidney Grundy, Frankfort Moore and other literary men being produced as expert witnesses to prove that Jerome's house was removed from the hurly-burly of German bands and hand-organs, and singularly well adapted for literary labor, and that such places were not easily found in London. The jury awarded Mr. Jerome a compensation of £500 for what might be considered sentimental damages in being compelled to give up the tenancy of a house where he had absolute privacy. The Company ought to have summoned M. Daudet to testify to the "silence of London."—*Philadelphia Telegraph.*

HOUSE-BUILDING BY CO-OPERATION.—A novel coöperation system has lately been started among the carpenters and painters of San Francisco, through which the individual workmen are becoming owners of homes of their own without any cost of construction. As soon as any member of the local organization has saved enough money to buy a lot and the necessary lumber, all his fellow-workmen turn to the next Sunday and build the house for him. In one of the suburban additions of the city a little colony of these "Sunday homes" has already grown up. The houses are not pretentious, but are solidly built and comfortable.—*Chicago Chronicle.*

TELEPHONES HURTING HOTEL BUSINESS.—One of the latest discoveries in connection with the development and extension of the telephone business is the effect which it has had upon the hotel business, and, consequently, upon railroad business. It is no doubt true that much of the business that formerly required a trip to New York or Boston by Chicago business-men is now transacted by means of the long-distance telephone. The rule works both ways. An observer of Chicago hotel business ascribes much of the dulness in the rotundas to this cause, and many of the hotel managers and clerks are disposed to believe that the theory is not only plausible, but founded upon stubborn fact.—*Chicago Western Electrician.*

A WARWICKSHIRE EPITAPH.—It is a mistake to leave one's epitaph to be written by bereaved and sorrowing friends. Far safer it is to prepare something appropriate and grammatical, and append it to the last will and testament. Mental distress is inimical to good literary style, albeit conducive to unconscious and incongruous humor. In proof of this, one has but to visit a little churchyard in Warwickshire, where the remains of a highly respected country Squire lie interred. The inscription on the tombstone informs the passer-by that the deceased was "accidentally shot by his gamekeeper," and includes the ambiguous addition, "Well done, thou good and faithful servant."—*London Daily Telegraph.*

PRIZES FOR TRADE ESSAYS.—Our Paris correspondence says that the Comte de Chambrun, who has founded and liberally endowed the Social Museum, has just offered two prizes of £1,000 each, open to persons of every nationality, for two essays on profit-sharing and trades unions. The topics to be treated are: in one case, origin of profit-sharing by workmen and employes; present state of the question; results obtained; research of the best practical means of application, advantages of profit-sharing with reference to relations between employers and employed, and to the fair remuneration of capital and labor. In the other case the topics are the different services that town and country laborers can derive from association in its different forms, friendly societies, masters', workmen's and mixed unions, industrial and coöperative societies of consumption and production, and construction of coöperative loan and savings banks. Memoirs written in French must be delivered at the seat of the Société des Etudes Sociales, 5 Rue Las-cases, Paris, before Dec. 31, 1896, for the essays on profit-sharing, and before Dec. 31, 1897, for the essays on unions.—*London Daily Telegraph.*

THE DEMERITS OF THE STEEL NAIL.—Perhaps it is as well for the manufacturer of the steel nail that so few people are conversant with the worthlessness of that article where any part of it is exposed to the weather. Attention has already been called to the fact in the columns of this paper that the steel nail as a shingle nail is a complete failure. The average retail dealer cares little about this fact any more than to know it for his own satisfaction. He only reasons that if the nails do not last there will be more demand for shingles. He may sometimes want to use this knowledge to combat the assertion of some one who says that there is an acid in the shingle he is making a run on that eats the nail. I have found places where the red cedar and the redwood shingle have been condemned on this account, and other places where the hemlock shingle had been frowned on for the same cause. One reason the dealer should know this is that he sometimes has a roof of his own to shingle; and it is possible that an occasional dealer may be found who feels as though it is his duty to tell his customers what he has read in the *Northwestern Lumberman* on this subject. I have spent considerable time on this question, both before and since writing my other articles and the result of my investigations are as follows: The life of the steel nail (when used for shingling) under the most favorable circumstances is not more than six or seven years, and the length of time ranges from that down to five, four and three years in sections where large amounts of soft coal are burned, or when, through any cause, a large amount of sulphuric acid was in the air. The results from the nail being exposed to the sea air are even more disastrous, as I have been told that on the Atlantic coast the steel nail has given place to the nail of copper, the life of the former being only about 18 months. I am well aware many carpenters will tell you this is not a fact, simply because they are wedded to the wire nail, it being the easiest to drive. They will call your attention to the fact that the old iron nail would break very easily, while the steel nail bends and will not break; but they do not tell you that the steel nail will rust and corrode and scale off, until in a short time there is nothing left of it, and that the old iron nail would outlast any shingle. There will be more trouble each year about shingles blowing off as long as steel nails are used. I am often surprised that dealers will persist in using them after these facts have been laid before them, and when a test can be made so easily. Take a handful of steel nails and drop them on the ground where they will gather dampness, and in one night they will be found to have rusted, and will be more or less stuck together; and don't forget that the most of the nails used to-day, either wire or cut, are made of steel. The use of the steel nail has been one of the greatest drawbacks to the red cedar-shingle business in the east, on account of the story so often told of an acid in the wood that eats the nail. Of course, this story was made out of whole cloth, as the saying goes, but it has had more or less effect, just the same.—*Benj. F. Cobb in the Northwestern Lumberman.*

BARTRAM'S GARDEN GATE.—Among the valuable collection of old photographs owned by the Fairmount Park Commission is one of the entrance to Bartram's Gardens which has a curious and authentic history. A few years after the buildings were destroyed a vigorous search was made for photographs, but the few that had been taken were completely lost, and the plates had been broken. On one of his voyages to the Orient a Philadelphia sailor discovered a photograph in a Japanese shop which he recognized instantly as Bartram's famous garden gate. It was brought here and its authenticity established by several old inhabitants, so that the Park Commission now holds probably the only photograph of the sort extant. — *Philadelphia Record*.

THE SALVATION OF ST. SOPHIA.—On the morrow, at the first capture of the city, the janissaries rushed to the great church, which they conceived was filled with gold, silver and precious stones. They found the doors fastened, but broke them open, and at once began to pillage. The Sultan, as soon as possible, rode to St. Sophia. Dismounting on the threshold, he stooped down, and collecting some earth, let it fall on his turbaned head as an act of humiliation. Then he entered the edifice, but stopped in the doorway some moments and gazed in silence around him. He saw a Turk breaking the floor with an axe. "Wherefore dost thou do that?" inquired the conqueror. "For the faith," replied the soldier. Mohammed, in an impulse of anger, struck him, saying, "Ye have got enough by pillage and enslaving the city, the buildings are mine." — *The Church of St. Sophia, Lethaby and Swainson*.

COWLED FOX AND COCK.—At Christchurch Priory, Hants, we may see many examples of sculptural humor, illustrative of fables and monkish legends, mostly taken from the Bestiaries of the Middle Ages. The question is, were they intentionally humorous, and therefore satiric; or were they merely the expression of a naïve simplicity, such as we find sometimes in the drawings of children? And was the comedy a part of the artist's scheme, or is humor, as distinct from buffoonery, a modern sense and a creation of modern times? Take, for instance, the well-known carving at Christchurch of a cowled fox preaching from a pulpit, with a small cock at his side. May not this be symbolic of the enemy, that old fox, vesting himself in the disguise of a holy monk in order to deceive the very elect, but prevented from so doing by the warning voice of the cock? Is not this a more probable reading than the idea that a monkish sculptor would venture to satirize his fellows by depicting them as foxes in the religious habit? And may not the hog preaching to a flock of geese, symbolize the folly of the multitude in not discovering the enemy through the disguise of a cowl. — *Good Words*.

A MINE ON FIRE OVER FORTY YEARS.—The Commissioners appointed by the Local Government to inquire into the "history, causes, and effect" of the coal-mine fires of Pictou County have just finished taking evidence. The Commission is composed of Inspector Gilpin, Deputy-Inspector W. Madden, Henry Mitchell and A. Dick. The work of the Commission was directed mainly to an investigation of the condition of the Foord pit. This mine has been on fire in one place or another since the fifties, and it is burning yet. Explosion after explosion has occurred, and many lives have been lost. When fire broke out in one place the miners resorted to another, sinking a new shaft. To avoid the fire on an upper level, a shaft was sunk and coal taken out on the level immediately below the fire. Soon the fire came through, and again the miners were driven out. Nothing that the owners could do availed to drive out the fire, and the splendid mine has been practically abandoned, though a little coal is now being taken out on a level below a part that is on fire. The object of the Commission is to learn whether something cannot be done to save so valuable a property as the Foord pit. — *Halifax (Nova Scotia) Herald*.

FARADY'S DISINFECTING SYSTEM.—In 1825 Professor Faraday was consulted by the Government about the disinfection of the prison at Millbank. The space amounted to nearly 6,000,000 cubic feet, and the surface of the walls, floors, ceilings, etc., was about 1,200,000 square feet. This surface was principally stone and brick, most of which had been lime-washed. A quantity of salt reduced to powder was mixed with an equal weight of binoxide of manganese, and upon this mixture were poured two parts of sulphuric acid previously diluted with one part of water and cold. The acid and water were mixed in a wooden tub, the water being first put in, and, it being more convenient to measure than to weigh the water and acid, ten measures of water and nine of acid were used; half the acid was first used, and when the mixture had cooled the remainder was added. Into common red earthen pans, each capable of holding about a gallon, were put 31.8 lbs. of the mixed salt and manganese, and there was then added such a measure of the diluted acid as weighed 41.2 lbs.; the mixture was well stirred and then left to itself, and all apertures were well stopped. The action did not commence immediately, so there was sufficient time for the operator to go from pan to pan without inconvenience. On entering a gallery 150 feet in length, a few minutes after the mixture had been made, the general diffusion of chlorine was sufficiently evident; in half an hour it was often almost impossible to enter, and frequently on looking along the gallery the yellow tint of the atmosphere could easily be perceived. Up to the fifth day the color of the chlorine could generally be observed in the building; after the sixth day the pans were removed, though sometimes with difficulty, and the gallery thus fumigated had its windows and doors thrown open. The charge contained in each pan was estimated to yield about 5 1/2 cubic feet of chlorine gas. In fumigating a space of 2,000,000 cubic feet, about 700 lbs. of common salt and the same of binoxide of manganese were employed, and it will appear by a slight calculation that about 1,710 cubic feet of chlorine were employed to disinfect this space. In common cases Faraday believes that about one-half to one-fourth of this quantity of chlorine would be sufficient. — *The Architect*.

THE BRUX DISASTER.—A remarkable disaster has occurred in the old German town of Brûx, in northwestern Bohemia, in many respects recalling the recent disastrous earthquake which almost entirely destroyed the town of Laibach, in Carniola. On Friday, July 19, the inhabitants of Brûx were alarmed by the sudden extinguishing of street lamps, and at first it was surmised that an accident had occurred to the gasworks. The report, however, spread that a large number of the houses in the Bahnhofstrasse were in imminent danger of collapsing, which was shortly afterward confirmed and supplemented by the news that the "Anne shaft, belonging to the Brûx Coal Mining Company, in the vicinity of the town, had been completely flooded by an inrush of sand and water." In consequence of the reports the authorities took immediate steps to clear the houses in the Bahnhofstrasse of their inhabitants, and it is owing to the promptness with which these precautionary measures were adopted that the subsequent series of disasters were attended by comparatively slight loss of life. At about ten o'clock a house in the Bahnhofstrasse completely collapsed and a crevice of about three metres in width opened in the middle of the street, letting out a voluminous and unceasing stream of water. At comparatively short intervals the houses continued to fall, and in some instances the debris caught fire, igniting the edifices which still remained standing. Towards three o'clock in the morning several houses in the neighboring street likewise collapsed, but the inhabitants succeeded in escaping in their sleeping clothes. The horror of the situation was greatly increased by the total darkness which prevailed, together with a heavy downpour of rain. The descriptions of the scene which have reached Vienna are heartrending in the extreme, the panic-stricken, half-clad inhabitants crowding the streets, not knowing in what direction to fly for safety. Early yesterday morning, in view of the danger which still threatens, the authorities ordered the clearance of the houses in that part of the town which has suffered most severely. Up to the present, eighteen houses are in ruins, and it is expected that many others will have to be pulled down. The damage is estimated to exceed 1,500,000 florins. In consequence of the breaking of the main gas and water pipes the town is without light or water. The distress which prevails is very great. Yesterday, during the last sitting of the Reichsrath, the Government was called upon to take prompt measure to alleviate the distress, and in view of the magnitude of the disaster to make use of the funds at its disposal for such purposes to assist the sufferers. The money thus expended by the Government will be voted during the next session. — *Vienna Correspondence, London Times, July 21*.

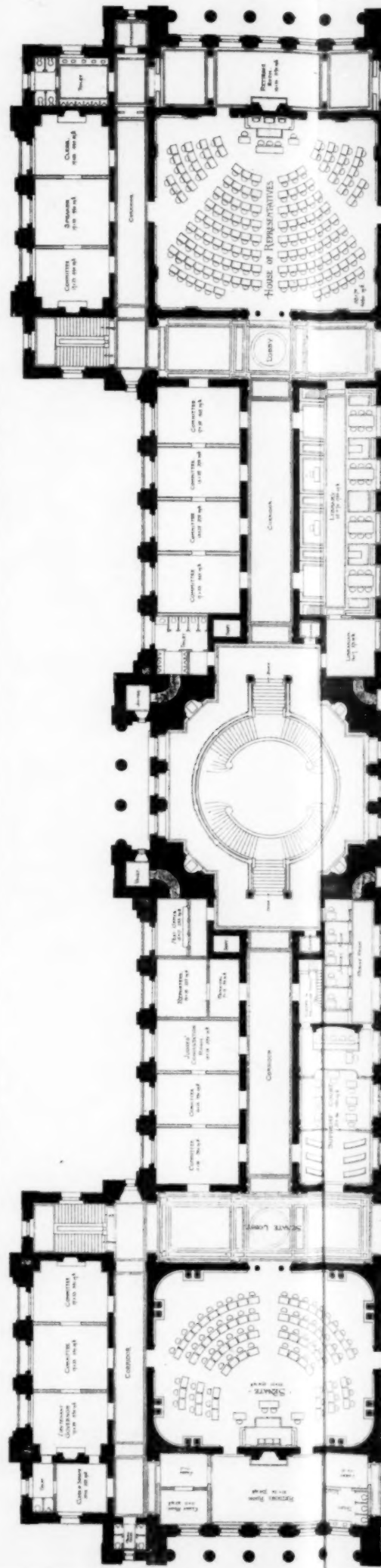
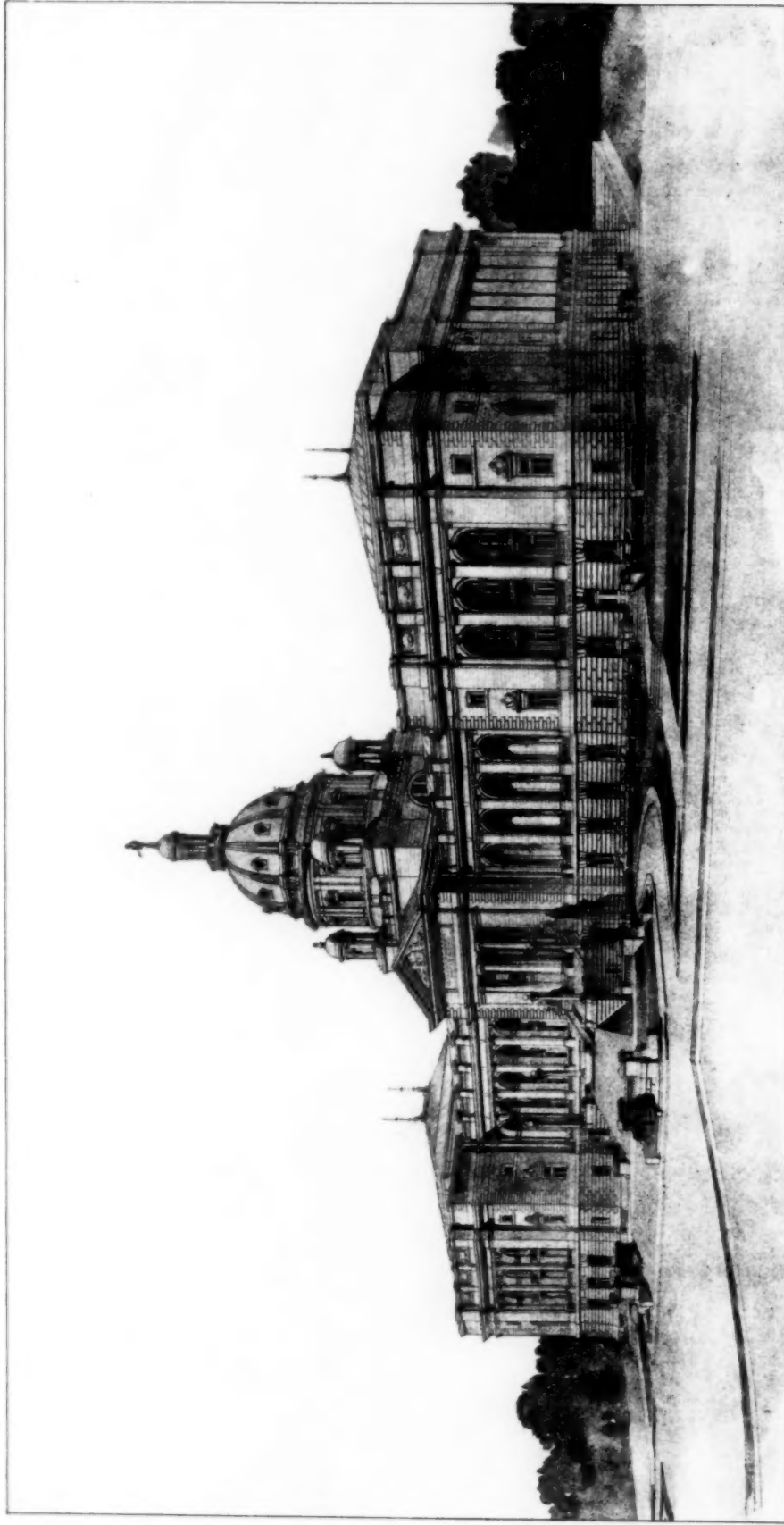
THE RAPE OF A CHURCH.—Many strange incidents are connected with the history of the restoration of churches, but none can match one which has just occurred in Brussels. Some time ago we advocated the immediate carrying out of essential repairs in the thirteenth-century church of the Sablon, in Brussels—a building which is more interesting than the cathedral church of St. Gudule. It was decided to undertake the necessary works, and they were placed under the direction of M. Van Ysendyck, an architect whose great book has demonstrated his acquaintance with Flemish architecture and the subsidiary arts. His name was a guaranty of a conservative restoration. Unfortunately there are too many examples of an opposite sort of treatment in Belgium as in France, and as a consequence restoration is too commonly supposed to mean the destruction of ancient work. Some practical joker or jokers, or it may be an enemy, resolved to take advantage of the delusion. Men were employed, apparently builders' laborers, and ordered to demolish the south porch of the church. It was not until a great deal of the masonry that could be reached without scaffolding was destroyed that the vandalism was suspended. It will appear strange that such a crime could be committed in one of the principal thoroughfares of Brussels without interference. The curé is an archaeologist, and he believes there is not a more interesting building in Europe than his church. The architect dwells at no great distance. There is a public square opposite the building, and one of the palaces which is guarded by sentries is close at hand. So is the Palais de Justice. All these apparent impediments would not count for much against audacity, especially when it was known that destruction is supposed to be an inevitable accompaniment of the restoration of churches. Then again there are many authorities connected with a foreign church, and contrary orders are not uncommon. It was by chance M. Van Ysendyck heard of the attack on the porch. He lost no time in acquainting the police. But it was too late either to prevent irreparable injury or to capture the vandals. What was done was thoroughly done. The piers were subjected to so much brutal force, the fragments are useless for restoration. As the porch was propped to prevent the collapse of the arching, there is not likely to be any accident; but a venerable example of Gothic art has lost its original character. M. Van Ysendyck deserves the sympathy of architects, for we are afraid it is only an expert who could devise and direct the operations, and they were not attempted out of friendship for the architect. Whoever was the criminal, he was too crafty for the easy-going police. — *The Architect*.

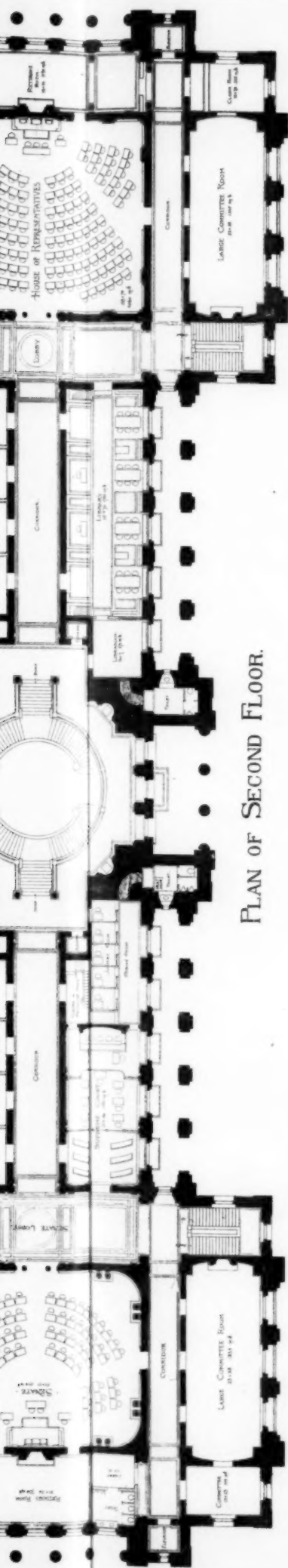
YANKEE VANDALISM.—A writer in the *Boston Transcript*, giving interesting notes of a summer in England, confesses to shame in acknowledging his American birth because very recently the most noted portions of the old historic Warwick Castle have been closed to visitors because of the vandalism of American visitors. He says "they would bring knives and cut their initials in every available spot, and back at the masonry for souvenirs, until all the world must be excluded from this highest and oldest part of the castle for fear of its ultimate surrender to the American jack-knife, after centuries of resistance to armed Britishers." Well, this relic-hunting trait is one common to Americans everywhere—but why it is so is not easy to tell. Almost the only criticism of visitors to the late Christian Endeavor convention, by the press of Boston, was in the form of a mild suggestion to them "to leave the Washington elm, as it would look better standing in Cambridge than to be pulled down and scattered in little pieces all over the country."

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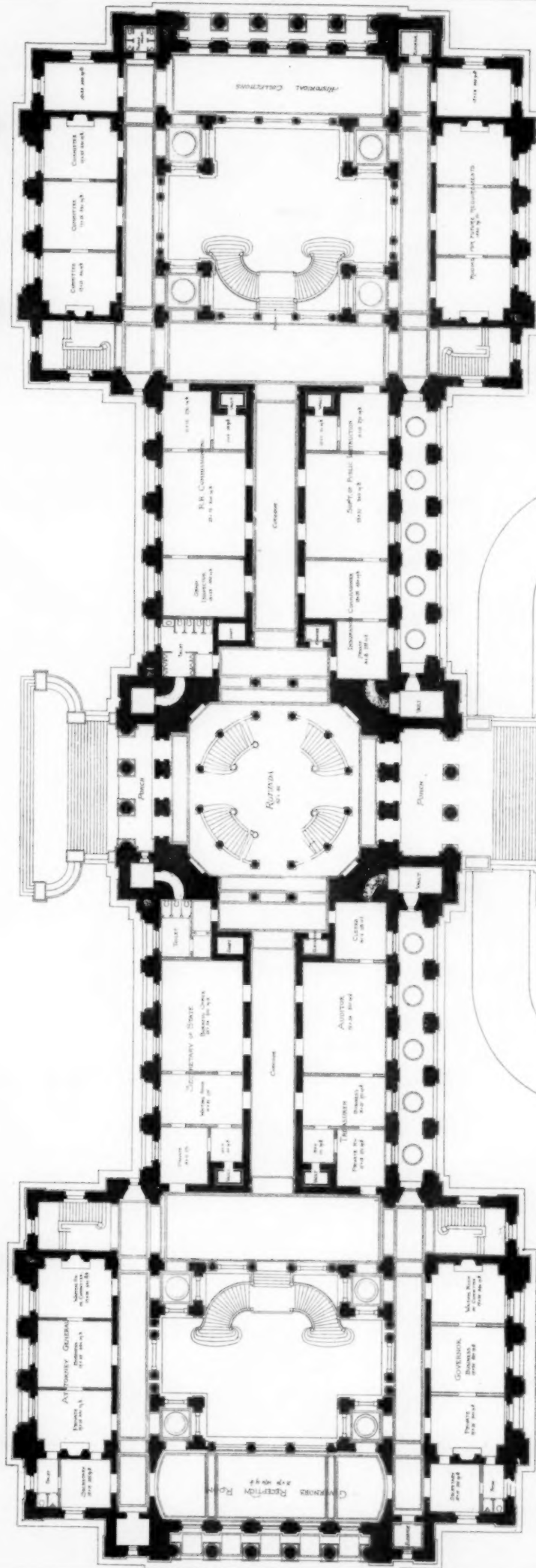
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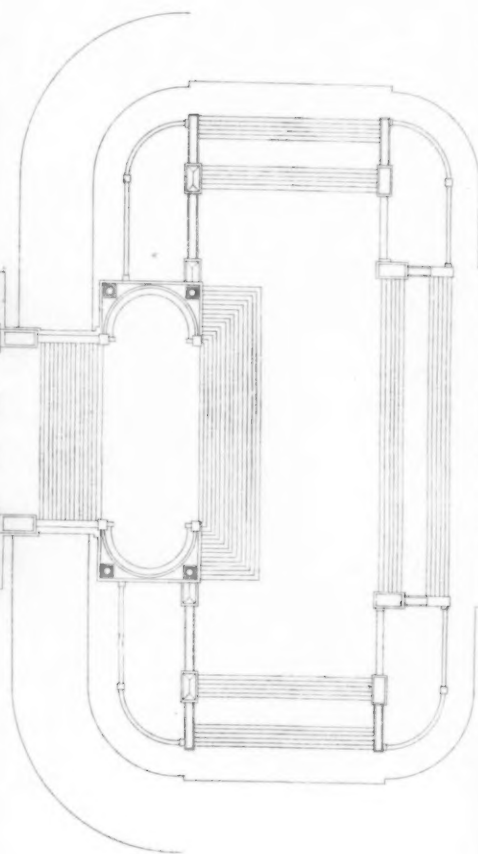




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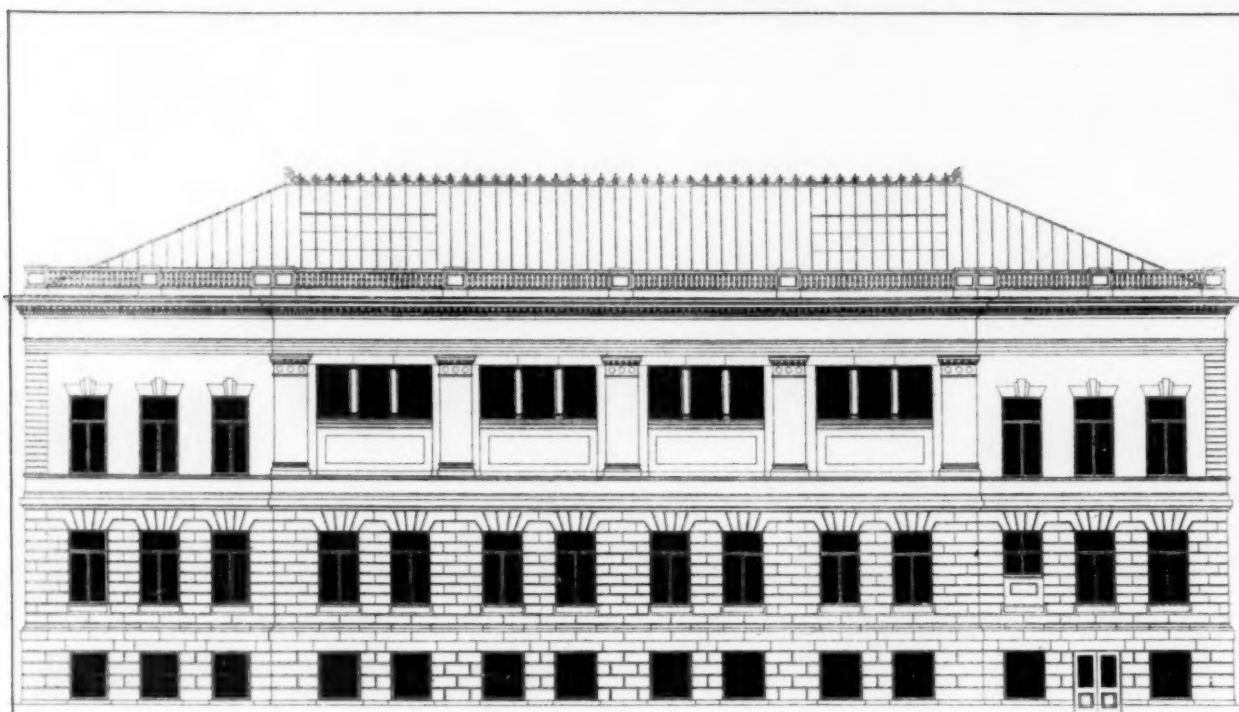
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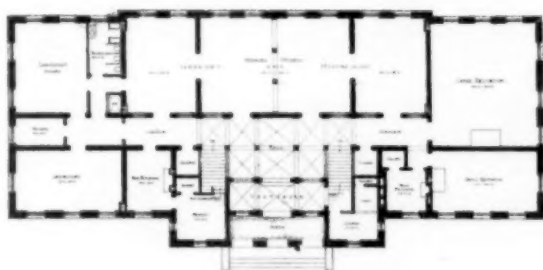
DESIGN FOR MINNESOTA STATE-HOUSE, SUBMITTED IN THE FIRST COMPETITION.

C. W. & A. A. STOUGHTON, Architects.

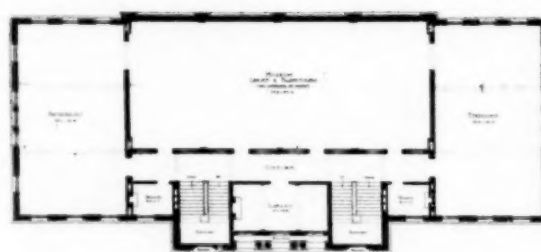
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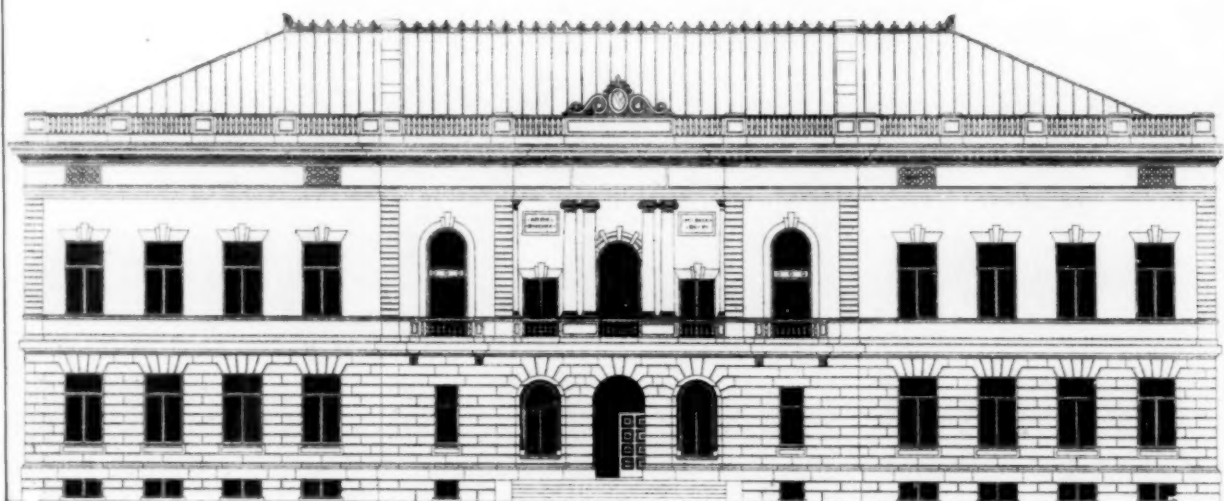
REAR ELEVATION.



FIRST STORY PLAN.



SECOND STORY PLAN.

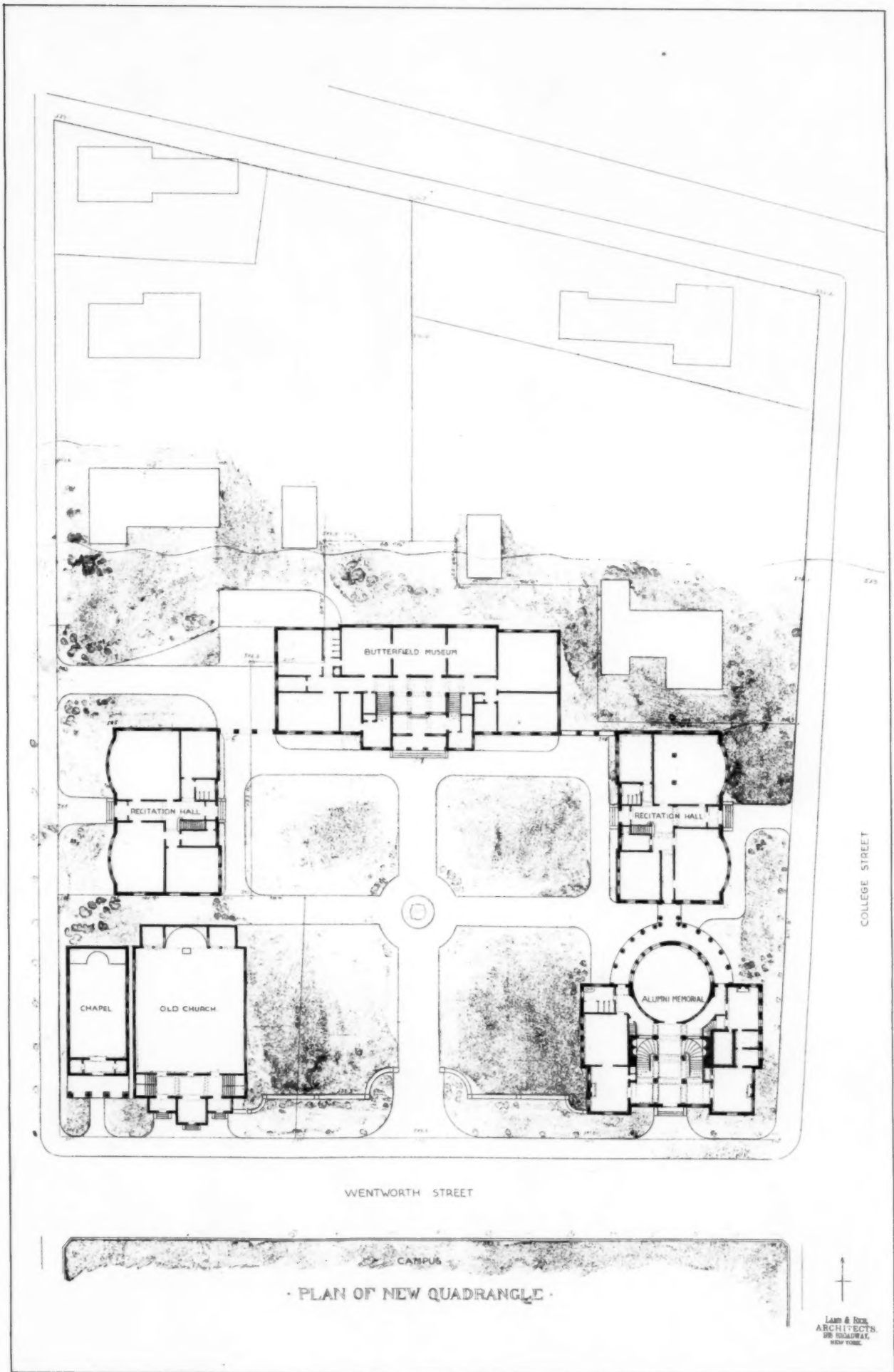


FRONT ELEVATION.

BUTTERFIELD MUSEUM: DARTMOUTH COLLEGE, HANOVER, N. H.

LAMB & RICH, Architects.

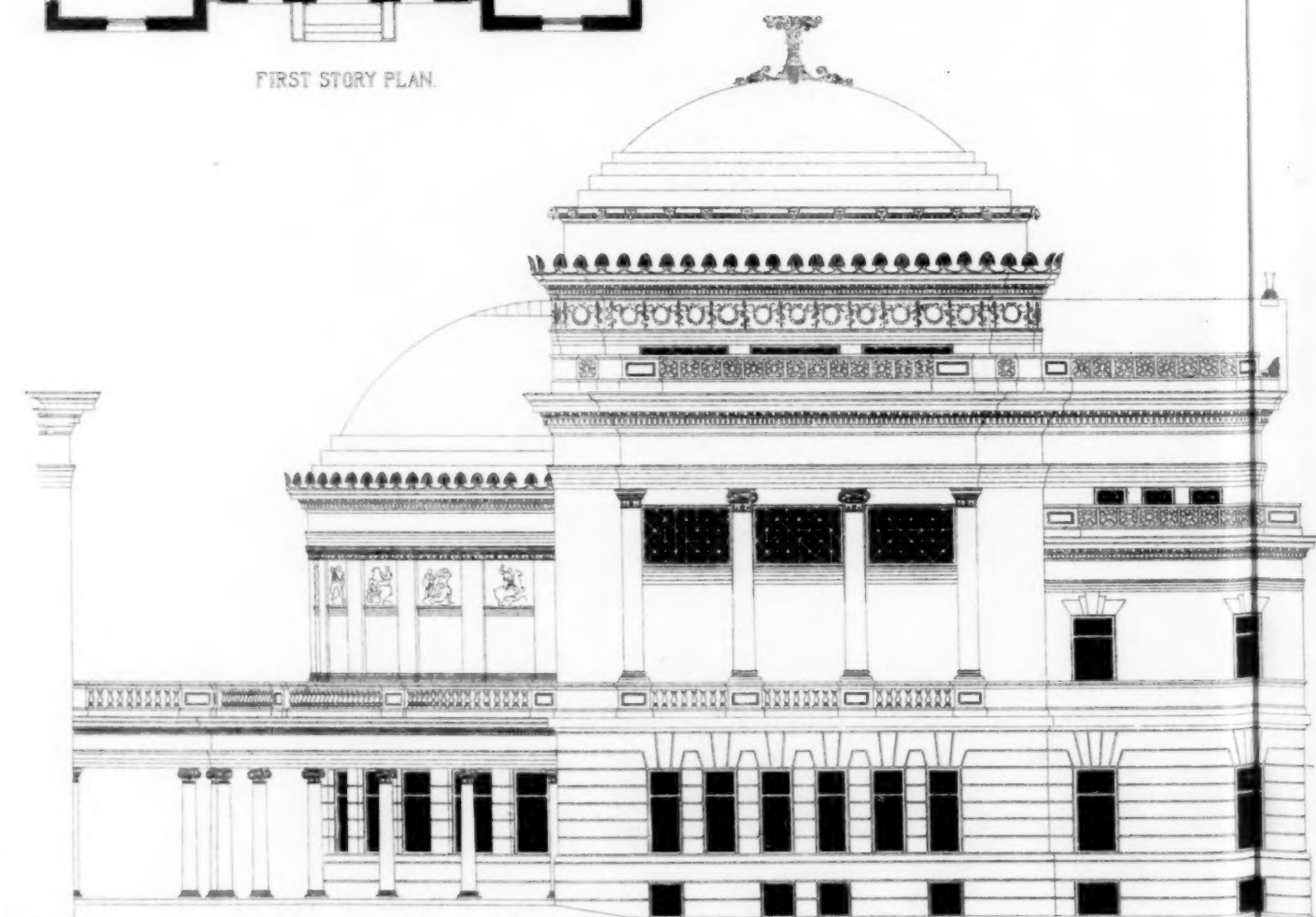
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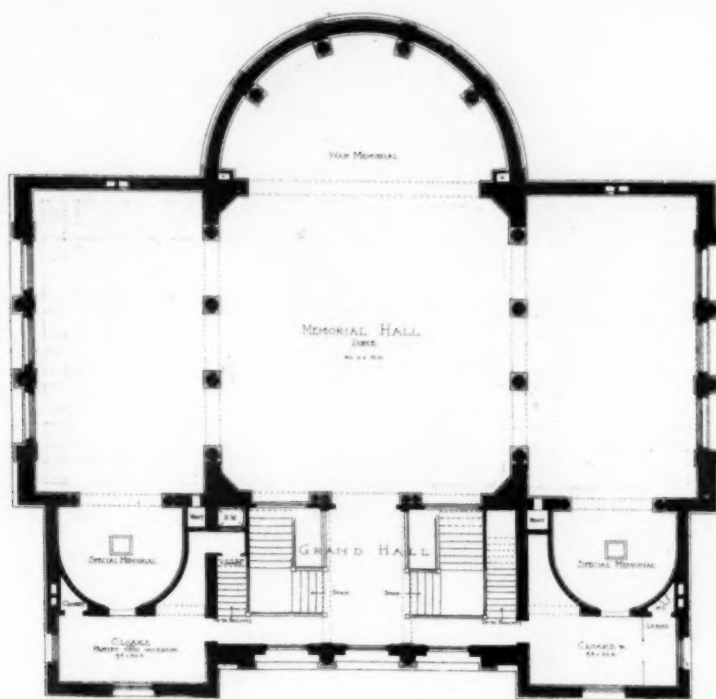
FIRST STORY PLAN.



SIDE ELEVATION
ALUMNI MEMORIAL HALL

ALUMNI HALL: DARTMOUTH COLLEGE

LAMB & RICH, Architects



SECOND STORY PLAN.



FRONT ELEVATION.