THE AMERICAN ARCHITECT AND BUILDING NEWS.

VOL. VII. Copyright, 1880, JAMES R. OSGOOD & CO. NO. 232.

JUNE 5, 1880.

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

CONTENTS.

THE accident at Madison Square Garden gave a fresh impetus to a movement which began a year or more ago for the displacement of Mr. Dudley, the Superintendent of Buildings for the city of New York. His conduct in evading the commands of Mayor Cooper regarding the plans of the ill-fated Garden was perhaps the final provocation which has induced that official to apply to the Governor of the State to have Mr. Dudley removed, reciting a variety of charges which have been accumulating against him. About some of these, which relate to personal misconduct, we know and can say nothing, but it seems to us that others show perhaps an unreasonably vindictive spirit on the part of his pursuers. For instance, he is arraigned for appointing persons as deputy inspectors who were not certified to be competent after examination by a committee of the American Institute of Architects, but the Institute laments in its report the lack of proper candidates at its examinations, and he may have had to keep his list of inspectors full as best he could; and his discretion under the law is so large in setting aside the provisions of the statute upon occasion that it seems harsh to make the exercise of it a ground of accusation against him, unless corrupt motives can be shown. That he erred sometimes in judgment is shown by the Madison Square Garden occurrence, but we would earnestly deprecate any attempt to shield the real culprit in that sad case behind an unpopular official, whose responsibility was as much secondary to that of the designer of the building as the fault of an inattentive policeman is less than that of the burglar who takes advantage of his carelessness to commit crime.

THE change in the administration of the New York law, by which the control and supervision of building operations will in future be committed to the Fire Department, so far from being a blessing, as some of the papers consider it, we look upon as a serious misfortune, a retrograde step which is sure to result in grave calamity. No doubt it is important to have buildings more secure against fire than they now generally are, but that is not all. The New York statute as now administered requires a mode of construction which if far from fireproof, is at least safer than that customary in the smaller towns, and by better coöperation of the two independent departments might be still more improved, while the less obvious but equally important details of construction which occupy a large part of the attention of the Building Department, must inevitably be more or less neglected in an office where the idea of fire as the element to be guarded against predominates over all others. The failure of the floors in a flour warehouse the other day illustrates a class of accidents which are becoming daily more frequent, and which only rigid inspection, quite different from that which a Fire Department would give, can prevent, and against which there is no insurance.

A DANGER which has often been pointed out in this journal has received a practical illustration in New York. At half-past two o'clock one night last week fire originated somewhere in the basement of the four-story apartment-house on the corner of Eighth Avenue and Fortieth Street. The flames and sparks were immediately drawn up through the elevator-shaft by the strong current which invariably exists in such places, and burned in the roof until this was destroyed and the fire became visible from the street, the inmates remaining unconscious of their danger until the alarm was given from outside, waking them barely in time to escape with their lives. We know of several splendidly-fitted buildings of this kind, six or seven stories high, where all the elevators run in the open wells of wooden staircases. How their occupants could get out in case of the bursting of a gas-pipe or a barrel of kerosene in the basement, we are unable to imagine. In some cases there is provided a "fire-escape," consisting of a vertical iron ladder, with rungs two or three feet apart, attached to the outside wall. It would tax the strength of most men to descend by it, under the best of circumstances, while for women or children it is practically useless.

THE perils of apartment-houses are small compared with those which operatives in the upper stories of city warehouses often have to encounter. In a report upon the late destructive fire in the Beebe Building, in Winthrop Square, Boston, the experts, after condemning the inflammable construction of the building, call attention to the fact that the only access from below to the upper stories, in which two hundred and fifty persons were daily employed in the manufacture of clothing, was by means of one wooden staircase, two and one-half feet wide, and ask if there is no mode of compelling manufacturers to provide their operatives with adequate means of escape in case of fire. There has long been a law in Massachusetts providing for just such contingencies, but it has been feebly enforced, if at all: now, however, a new statute has been passed, to the same effect, and we are informed that "this one is to be enforced." We hope that our information is true, but confess to having grave misgivings that the same causes which led to the relaxation of the former rules will apply with equal effect to the new one. This particular fire happened to occur a few minutes before beginning work in the morning, so that no one felt obliged to think of the poor girls who had escaped a horrible death by a hair's breadth as otherwise than unusually fortunate. Another time, when the flames shall break out a little later in the day, the sight of the mortal terror and despair of a hundred human beings may nerve public opinion to demand an expenditure for protecting the lives of the helpless employés in our magnificent buildings, of at least a thousandth part the sums lavished to attract the careless passer-by.

THE memorial which we published two weeks ago, drawn up by architects of the Province of Ontario for presentation to the Commissioner of Public Works in relation to the terms of the competition for new public buildings at Toronto, was signed by about sixty of the profession, and submitted to the Commissioner last week by a deputation consisting of Messrs. Langley, Strickland, Smith, Connolly, and Lalor. The deputation was courteously received, and its arguments listened to with attention, the Commissioner finally replying that though the terms as published had been adopted after consultation with experts he would postpone the date for receiving drawings to October 15. This is better than might have been expected. It is well understood that after terms of such a kind are published, any one who goes to work in good faith in accordance with them creates a sort of contract between the Government and himself, and a subsequent modification of them without timely notice to him, might, if it were to operate to his disadvantage, give him a valid claim for damages. There are so many chances that a second notice may escape the attention of those who have received the first, and that ground may be given for complaint, that it is only prudent to be extremely cautious in modifying terms once published. We believe, however, that Mr. Fraser has taken every precaution to protect both himself and intending competitors from any injury that might arise from the extension of time. The proper time to influence those who intend to invite competing designs is before the publication of the invitation, and the best mode of exerting that influence in a way to make it applicable to all cases is for respectable architects to agree not to invade their neighbors' territory in quest of important commissions, which legitimately belong to the

local practitioners, unless upon conditions which shall secure adequate compensation and consideration to all who compete. Those who desire the privilege of selecting among many designers will soon come to understand and accept the terms on which alone they can obtain it.

Very many architects know something of the *Série de Paris*, or schedule of rates for all kinds of building work in that city and suburbs — masonry, carpentry, joinery, painting, roofing, metal-work, and all the other minutiæ of construction, something after the likeness of the English builders' price-books, but having an official sanction and origin. As in England, the quantities of each kind of work in any proposed building are measured from the drawings, either by the architect or by a surveyor, or *vérificateur*, and the amounts being multiplied by the prices of the *Série* give the approximate cost, not only of the building, but of any extras or deductions which may suggest themselves. In making tenders, the contractors simply offer to make such discount, or *rabais*, from the official scale as they think they can afford, and the contract is awarded at six, eight, or nine per cent discount from the *Série*, as the case may be. No architect who has not worked with schedules of quantities and prices can conceive how much time, vexation, and anxiety is saved by their use, and how greatly the measuring of the quantities helps the designer to understand and think out all the parts of his conception. With us at present, not only do the contractors who tender do so with the vaguest notions of what is required of them, but the architect himself is apt to leave important items to future consideration unless some particularly sharp contractor calls his attention to them. In consequence, the bids vary enormously. It is not impossible to find houses, exact counterparts of each other, and built at the same time, of which one cost twice as much as the other; and a variation of a hundred per cent between the highest and the lowest estimates for a building is the rule, rather than the exception, where a number of tenders are made. At present the Paris schedule is undergoing revision. We hope the discussions upon it will penetrate to this side of the ocean, and excite a desire to attempt some similar systematizing of our needlessly difficult business.

Legal items have been quite common in the English architectural journals of late. Two cases where architects were obliged to bring suits to recover payment for their work are reported in the *Builder* last received, and in both of them the architect gained his suit. One of the defendants excused himself for not paying for his plans by saying that the cost exceeded the limit which he had fixed, but the evidence showed that the architect, after examining the ground, had advised his client to build a better house than he proposed, and the latter had approved the suggestion, so that the plans were very naturally drawn with a view to a greater expenditure than was at first intended. In the other case, plans and specifications had been made for alterations to a certain tavern. The cost of the alteration was six hundred dollars, and the architect, who also superintended the work, made the modest charge of thirty dollars, or five per cent. This would seem to be just about the value of the preliminary measurements alone, but the judge thought otherwise. The draughtsman who made the plans testified that with certain interruptions, this work alone, a small part of the whole labor requisite, took him seven days; but his Honor's opinion was that it might have been done in about five hours. Taking into consideration, however, the trouble that the architect had been put to in superintending the work, he ordered judgment for eighteen dollars and costs. Draughtsmen are cheap in England; probably twelve dollars would have covered the draughtsman's wages for the seven days; leaving six for the architect's responsibility, personal interviews with all the parties, time in measuring and superintending, office and family expenses during the time he was occupied on this commission, interest on the cost of his education, the value of his skill, and the greater part of the expense of getting his poor little pittance. Were it not for the judges, it seems as if English professional men might have a chance of getting justice.

Two interesting French cases are reported in the *Moniteur des Architectes*. In the first, two properties were divided by a low party-wall, serving only as a fence. The defendant extended the wall upward, on his side of the centre line, in order to form an enclosure for some new structure. There was no question of the strength of the addition, but its weight being brought wholly on one edge of the old wall below caused this to settle and crack. His neighbor sued to compel him to pull down both the old wall thus injured and the addition, and rebuild so as to bring the weight on the centre of the foundation, as it should be, and the court ordered that this should be done, and that the defendant should pay the whole expense, besides the costs of the suit. Probably the next time he builds upon a party-wall he will employ some one to tell him how to do it properly. In the other case, two houses stood side by side in Paris, divided by a wall which stood wholly on the land of one of the proprietors, the house of the other being simply built up against it. The owner of the wall brought suit to compel his neighbor to buy half of it, thus making it a party-wall. The counsel for the defence argued that if the proprietor of the wall and the land on which it stood chose to pull it down, thus leaving the end of the defendant's house open, the latter would have no right to prevent him, and in that case either party could afterwards build on the party line and recover half the cost from the other, but so long as the defendant was willing to take the risk of the plaintiff's removing the wall, he was free to enjoy its protection and could not be compelled to buy or pay for any part of it, and the court sustained this view and gave a decree accordingly.

The Manhattan Company, which now operates all the elevated railroads in New York, has published its semi-annual statement, containing some interesting information. The total business of the roads gives a profit of a little less than eight per cent on the total amount of capital and bonds. It is well known that the construction was paid for principally from the proceeds of the bonds, the capital being to a large extent nominal, so that this result shows a very large return on the actual outlay. The average fare received was seven and thirty-two one-hundredths cents. The charter of the companies requires them to run at five cents fare for four hours in each day, two hours in the morning and two in the evening, the rate at other times being ten cents, without any reduction for package or season tickets, so that it appears that more than half the passengers are carried at the five-cent fare. The average cost of transportation is four and two one-hundredths cents per passenger. According to the Philadelphia papers, the average cost of transportation on their horse railroads, which certainly do not appear to the stranger to be operated at a lavish expense, is four and twenty-one one-hundredths cents per passenger. Considering the superior speed on the elevated roads, and their exemption from the heavy cost of removing snow in some seasons, this comparison is very favorable to them. It is fair to remember, in estimating the pecuniary results of the business of the New York lines, that two of them have been extended, at enormous cost, far beyond the point to which they can at present be profitably operated, and that the development of the upper portion of the island will add largely to the receipts, without increasing the running expenses.

We have received a letter from a San Francisco architect, courteously calling us to account for our favorable comments on a plan for a five-hundred-dollar cottage published in the *Bulletin* of that city some weeks ago. The writer asks whether it is not lowering the dignity of an architect to publish plans and specifications in a daily paper, inviting the public to call upon the designer, and so on, as if the whole thing were to some extent an advertisement, and complains that the encouragement of such practices renders it difficult to keep up a high standard in the profession. To this we will say that we did not feel called upon to express our opinion of the taste displayed in the presentation of the matter: as we understood it, the design had been bought for publication by the proprietors of the *Bulletin;* a perfectly legitimate transaction; and the disagreeable pushing forward of its author we were quite ready to attribute to the small journalist who prepared the text of the article, such gratuitous puffing being a common habit among that class. All we had to consider was the merits of the plan, which we still think to be ingenious, well-considered, and economical, and the specification, which appears to us intelligent and full. We were the more disposed to praise what we found worthy of commendation because of the neglect with which such problems are treated, in one way by builders, whose ignorance of planning and lack of imagination generally leads them, in such constructions, to a repulsive meanness, and in another way by architects, who, when they touch such work at all, sometimes sacrifice, almost wantonly, the convenience and comfort of the occupants to some unnecessary whim.

NOTES ON ELEVATORS.—I.

FEW, probably, of those who frequent the hotels and public buildings of our great cities, and ride from story to story in the swift and easy-moving elevators, realize how short is the time since these now indispensable conveniences began to come into anything like general use. Although steam freight-hoists have been known for forty years, it is only about twenty since the first passenger-elevator- or "vertical railway," as it was called, was constructed by the late Otis Tufts for the Fifth Avenue Hotel in New York, and immediately afterward another of the same kind was put into the Continental Hotel in Philadelphia. These machines, which rendered the two hotels famous for years, were very different from any which have since been built. Those who saw them, years ago, for they have long been replaced by more modern contrivances, will recollect that the middle of the car, or "cab," was encumbered with a large vertical cylinder, covered with wooden sheathing. Inside of this cylinder revolved an enormous screw, extending from top to bottom of the shaft, and in the threads of this, which were set at a low pitch, were engaged strong projections from the inside of the cylinder in the cab, so that as the screw was revolved by the engine below, the cab, strung upon it like a nut upon a bolt, moved up or down, slowly, but with absolute safety. This cumbrous and costly apparatus kept the field to itself for some time, until public opinion had so far changed that people, accustomed to the idea of vertical propulsion, were willing to trust their lives to the strength of wire ropes, and suspended elevators being comparatively simple and cheap, their use rapidly spread, until now there are few hotels of any pretension, warehouses or office-buildings, which are unprovided with them, and many are in use in private houses; but the tenacity of wire has its limits, and with rope suspension begins the history of elevator accidents.

With the exception of the obsolete "vertical railway" variety, the essential parts of all elevator shafts and the cars or cabs which traverse them are the same, and it is well to have a clear idea of these before attempting to study the very diverse modes in which the cab is propelled.

The shaft, as commonly constructed in this country, consists simply of holes cut in the floors, one above another, and furnished with two upright timbers to serve as guides for the car. These posts are usually arranged for passenger-elevators in opposite corners of the opening, as this gives opportunity for access to the cab on all sides: for freight-hoists of largest size, it is often better to place them in the middle of the sides. The guide timbers should be perfectly straight and plumb, and of assured strength, for in case of accidents to the suspending ropes, which are always liable to happen, the whole weight of the platform is suddenly thrown upon them by the safety-catches, and any weakness of joints or crookedness in the timber which should prevent the instant and effective action of these, would ensure its destruction. For this reason the splicing which is generally necessary should be sharply looked to, and knotty or cross-grained lumber rejected. Hard pine is very commonly employed, and is perhaps the best wood for the purpose, and the posts, if for instance eight by eight inches in section and too long for single sticks, may with advantage be built up of four by eight inch pieces, breaking joint in the middle of their length, and bolted. This will give a practically solid timber from bottom to top of the shaft, independent of the floors, and is much better than the common construction of short lengths of whole timber, butted together, and kept in line only by the aid of the beams which surround the hatchways. The angles of the posts which look toward the opening are chamfered, and to them are secured iron or hard-wood guides, which are clasped by a notched projection on the bottom of the platform, and direct its motion by keeping it from swaying or twisting. The upper ends of the posts support a pair of cross-beams, which serve to carry the pulleys over which the ropes run. Occasionally, but rarely in this country, iron rolled T-beams take the place of wooden verticals. With us, even in so-called fire-proof buildings, the posts are almost always of pitch-pine, soaked with the grease which is used to lubricate the guide strips. When, in addition, as is here generally the case, the hatchway is enclosed in each story with the thinnest possible structure of varnished boards and glass, or wire-netting, a structure is formed whose dangerous effectiveness in spreading fire from one story of a building to another, the architect cannot too carefully keep in mind. Severe legal penalties should prevent such reckless constructions as are sometimes seen, where inflammable shafts of this kind occupy the well-hole of a staircase, itself of thin boards, oiled and varnished, and sometimes forming the only means of communication between the upper floors of a lofty apartment-house or office-building and the ground. There is usually a strong upward draught in such a shaft, aided often by a ventilating skylight over it, and a flame kindled among oily rags or shavings, or by hot ashes from the boiler which commonly stands near its foot, is immediately drawn into it and assisted by the rubber gas-pipe which hangs in the middle runs with such celerity through the whole height that a wooden staircase in close proximity to it is rendered useless in a few seconds.

Such building is considered criminal abroad, and passenger-elevators are there very differently arranged in this respect. On the Continent, open hatchways are forbidden within the walls of buildings, and such elevator-wells as are placed there are always enclosed from bottom to top by stout brick or stone masonry, with doors at each story. Iron guides are secured to the walling of the shaft, which thus contains nothing inflammable except the cab, and this is itself frequently made of sheet-iron. It is, however, very common to arrange the shaft altogether outside the building, in the court-yard of the large hotels, erecting a light but well-braced open frame of wrought-iron beams and rods, with doors at each story through the outside wall. A little roof protects the pulleys and ropes at the top, and the cab is made tight against the weather. Such an arrangement is hardly practicable in our climate, but it is quite possible, and should be made compulsory, to enclose all such shafts with fire-proof walls.

The apparatus which moves in the shaft consists essentially of a strong platform, suspended by two or more iron rods from the ends of a yoke or beam, which is attached to the rope. In freight-elevators, which carry heavy loads and are subjected to rough handling, the platforms should be of white oak, and bound with iron, besides being strongly braced with iron beneath. For elevators of this kind there is also generally a double yoke, one heavy diagonal beam of iron or wood serving to support two corners, while a lighter one, attached to the first, holds the other two. In certain large hoists the diagonal span would be so great that it is best to carry the beam directly across, so that its suspending rods hold the middle of two sides of the platform, and the corners are secured by iron braces, but this construction interferes with the free use of the platform at the various floors, and is not often adopted in modern machines.

The construction of passenger-cabs is the same, with the addition of a light enclosure of wood-work with panels of glass or wire-netting set up around the edge of the platform, and generally also with skylights and ventilators in the ceiling. Sliding doors occupy one, two, or even three sides of the enclosure, and upholstered seats are fitted in wherever they will be out of the way of the doors. Some of these cabs are gorgeously inlaid and decorated; mirrors are inserted in the small amount of surface available for that purpose, and rich chandeliers hang in the middle. They are to be seen of all sizes, from the tiny box in use in private houses to the spacious rooms, with doors wide enough to allow four men carrying a bed to pass through, which are used for transporting patients to the upper stories of hospitals. It is usual to provide an electric bell, with an annunciator in the car and buttons in each story, to call the elevator from one to another, and the wires for these, as well as the flexible tube for conveying gas to the chandelier, coil and uncoil on top of the structure as it ascends and descends in the shaft. The starting, stopping, and reversing of the motion of the car is effected by means of a "shipper" or shifting rope, consisting generally of a half or three-eighths inch endless wire cord, stretched over pulleys at the top and bottom of the shaft, and so arranged that one side passes through the car. As this moves up and down over it, it is an easy matter to seize the line and by a pull in either direction reverse, stop, slacken or quicken the movement at pleasure. To facilitate the grasping of the cord, iron handles are often slipped over it, and adjusted by set-screws so that one will be found in a convenient position as the car nears each story. Some builders use a still neater arrangement, by which the rope is entirely out of sight, the only visible apparatus for controlling the motion of the elevator consisting in a wheel some twelve or fourteen inches in diameter, at one side of the car, with a thick round rim suitable for holding in the hand. Around a pulley attached to the shaft of this, a loop of the shipper is taken so that it revolves as the platform moves up or down, and a turn of this in either direction acts upon the shipper in the same way as a direct pull.

To prevent any possible negligence on the part of the attendant from allowing the platform to be drawn up against the top of the shaft, a sleeve is fixed upon the shipper rope near its upper end, larger than the opening in the ceiling of the car, so that when this is lifted to that point a further rise pulls on the shipper by means of the cab itself, and stops the engine. In the same way a similar sleeve at the lower end prevents the platform from descending below a given point.

It is usual in passenger-elevators to fit latches both to the cab doors and the corresponding doors of the enclosure, opening only from the inside, one of the doors to the shaft being fitted also with a lock which can be opened from the outside. In this way access to the shaft or car is made impossible for any person except the attendant in charge. In some cases, especially in apartment-houses, it is considered better to run the risk of accident than incur the expense of a regular attendant, and the doors are made to open from the outside. In order to be able to control from the different floors the movement of the car in the shaft, the outer side of the endless shipper rope is made to pass within reach, and of course a pull at any part of this will reverse, start, or stop the engine in the same way that it is controlled from the cab. The French have a simple arrangement of handles at the different stories, which act upon corresponding projections in the shifting rope, so that the platform may be called in either direction and stopped exactly at a given story, by pulling out or pushing in the appropriate handles either in the car or outside.

Whatever the arrangement, the shipper rope should be carefully watched, and renewed as soon as it begins to show signs of fraying or weakness, for the breaking of this cord very often occasions serious accidents by allowing the platform to be drawn up so forcibly against the top of the shaft as to break the main ropes, when, of course, it falls to the bottom unless caught by the safety appliances, which many elevators do not possess, and whose action is always uncertain. In order to avoid the continual bending around small pulleys

which is inevitably fatal in time to wire ropes, short chains are sometimes inserted at the upper and lower end of the shipper. As the movement of this is limited — a pull of eighteen inches or so in either direction being as much as is ever necessary — all the bending around the pulleys then comes upon these chains, the ropes between being always straight. For freight-elevators the whole length of the shipper is often made of chain.

So far, the visible features of all modern elevators are the same, however the car or platform is propelled. In all, the endless shipper rope is the means for controlling the movement, although it exerts its power by various modes, and the general appearance of shaft and cab are alike everywhere. But in the manner of applying power to the hoisting of the platform there is almost infinite variety, and upon the variations in the modes of propulsion depend the different forms of safety apparatus, whose action it is important to understand clearly. Most of the safety appliances are adapted only to rope-suspended apparatus, and indeed they are hardly necessary in any other kind, so that it will be well to study their various forms before describing the still more various ways in which suspended elevators are driven, but it is perhaps judicious to glance first at the small number of machines which dispense wholly with ropes, and afterwards consider the rest of the subject by itself.

Among the modern elevators which secure safety by avoiding the use of ropes or chains, the most ingenious, and in many respects the best, is one made by Messrs. William Miller & Co. of Cincinnati. In this the screw principle, on which the early "vertical railways" depended, is employed, but in a much more convenient manner. Instead of an immense threaded shaft extending the whole height of

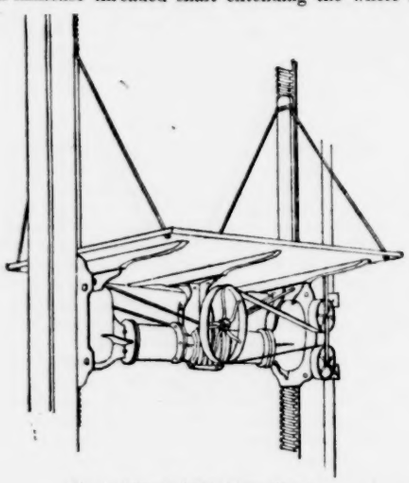


Fig. I. Miller's Safety Screw Elevator.

the building, through the middle of the platform, two notched strips of iron, moulded so as to form slices of a long hollow screw, are secured to the guide posts, the castings being fitted end to end so as to make the succession continuous to the top of the lift. Under the platform are placed two short vertical screws, whose threads engage in those of the side strips, and as these are turned around with equal velocity the platform rises and falls steadily and securely, for even the total destruction of the endless screw on one side would only tilt the platform, which could not fall until both had given way, and the breaking of the belt or shipper rope would simply leave the load stationary.

Motion is communicated to the short screws beneath the platform by means of a long endless belt, reaching from top to bottom of the shaft, from which a loop is taken out at one side and carried over a pulley under the middle of the platform. From this pulley the power is transmitted to the screws by a very simple system of bevel-wheels, and as the elevator moves up and down the loop travels with it.

As the belts for a lofty shaft are very long, ropes are sometimes used instead, and an arrangement for tightening the rope or belt from time to time is applied; but, in general, elevators of this kind work best where the load is not lifted through a great distance, and strength rather than speed is desired.

THE VENTILATING FIRE-PLACE.[1] — II.

In the chimney of the fire-place in question only two distributors were required. These appear to have no injurious effect whatever upon the draught, although flat dampers are used in them instead of the cone-shaped ones recommended and shown in the drawings.

The fresh warm air having entered the room as described, at the ceiling, descends as it cools, and gives place to that which follows, until it reaches the fireplace-opening below, through which it finally escapes. In this way, for every-day use, the draught of the fire-place is supplied entirely with fresh air previously warmed against the smoke-flue, and the amount of air changed is, on these occasions, dependent upon the size of the smoke-flue, the inlet registers being as large as desired. For special occasions, however, when the room is full, and a much greater change of air is needed, the ventilators are caused to act in a manner quite different. The cold-air supply register at the back of the fire-place is closed. The damper at the top of the fresh-air chamber (Fig. 184, top) is opened, and the warm-air supply register at the top of the room becomes a foul-air exhaust flue to assist the fire-place smoke-flue in carrying off the extra quantity of heat and foul air generated by the gas-lights and guests, to the corresponding chambers above. Thence it enters a large exhaust-flue provided for it at the top of the house and is removed. Fig. 187 shows the chimney-stack with this exhaust-flue at the top. This system may be adopted always in summer.

Where the rooms above are, as is customary, used for cloak-rooms or dressing-rooms during an entertainment, the open fire-places in them may be made to assist in the ventilation of the occupied room below as follows: The registers in the chimney-breasts at the tops of these rooms are left open. That part of the foul air which does not escape through the damper at the top of the air-chamber containing the distributor, enters the room through these registers, and is carried off through the open fire-places, just as does the fresh air in the room below. At the close of the entertainment these rooms may be thoroughly aired by opening the windows. Such use of the upper rooms is, of course, not to be recommended; but where for the sake of economy the exhaust-flue at the top of the house is omitted, recourse may be had to this method. The removal of the foul air being thus provided for, the fresh air is supplied on festal occasions as follows: Open fires on these occasions in the occupied rooms are not often used. Their heat would be too unevenly distributed, and would prove insupportable to those nearest them. Moreover but a comparatively small amount of artificial heat is required. Each guest is an open fire-place to the rest, generating about as much heat as an ordinary candle. Each gas-burner forms another open fire, and radiates its heat in every direction. All that is necessary is to take the chill off of the large volume of fresh air introduced, so that, with ample ventilation, no unpleasant draughts are felt. For this purpose a small furnace, with a very large fresh-air box, is placed in the basement. It stands in this case under the parlor, and the fresh air is taken directly from the open vestibule through large cut brass registers, similar to that already described for the open fire-place. Thin cut brass is used in preference to the ordinary enamelled iron, because it does not show the dust as this does. A volume of air as large as is required and slightly warmed is thus distributed over the ground floor occupied by the guests. The doors of the entertainment rooms are usually left open so that if desired the supply of fresh air comes from the entire house (excepting those rooms which receive and serve as passages for the foul air and are therefore closed off), instead of from a single register, though the latter should be large enough to do the work for each room alone. Should then the weather be moderate, the windows in the upper stories may be opened wide or, if it be cold, partially opened, and the general temperature of the house lowered as the heat below increases, or regulated at pleasure. No window in the entertainment-rooms need ever be raised as is now customary generally at supper-time, much to the annoyance and distress of many of the guests.

What now is the motive power, which, when the fire-place is not in use, produces in the exhaust-flues a draught of the required velocity — powerful, reliable, steady and yet easily controlled?

At one end of the house this motive power is furnished by the furnace smoke-flue when a furnace is used, or by a gas-jet in the air-chamber when it is not; at the other end, by the range smoke-flue, which, if desirable, may be aided by a gas-jet in the fresh-air chamber.

In Figs. 184 and 187, the sheet-iron furnace-flue will be seen at the right of the distributor. The iron is one millimeter thick and extends up to the ceiling of the third story. The flue at this point becomes an ordinary eight-inch by twelve-inch (20 by 30 cm.) brick flue. The parlor fire-place flue and distributors are also constructed of heavy sheet-iron pipe 1 mm. thick and 25 cm. (10 inches) in diameter, but the iron ascends only to the ceiling of the third story, where, like the furnace-flue, it enters a brick flue (in this case 30 cm. square).

No iron flue should ever run to the top of a chimney, for two reasons; first, because of the condensation of the water of combustion, which requires an absorbent material, like brickwork, to take it up before it falls back into the pipe to rust it and make a disagreeable dripping sound; and, second, because of the unnecessary expense of so doing.

This iron furnace-flue, coming in close contact with the fire-place flue, heats it to such an extent that a powerful ventilating draught is maintained in the latter at all times. The furnace-flue also heats the air in the fresh-air chamber, and produces another powerful ventilating draught through the upper register. The velocity at this point may also be increased almost without limit by a lighted gas-jet placed just under the damper opening from the top of the air-chamber into the space above (Fig. 184, top, gas-jet represented by asterisk). This gas is lighted and extinguished in the writer's house by electrical apparatus, — the safest, most economical and most convenient method; but where electricity is not used, the gas may be lighted with a match or gas-torch, through the brass register at the top of the room.

These two openings then — the register above and the fire-place smoke-flue below — are capable, combined, of carrying off the foul air of the parlor at the rate of sixty or seventy cubic meters a

[1] This paper, by the writer of the Open Fire-Place articles, will be incorporated with them in their separate form.

minute, without inconvenience to a single guest. By enlarging the registers, and flues, any desired increase of ventilation might have been provided for at but slightly increased cost. Experiments made in the same air-chamber and under similar conditions on two distributors of the same size, one made of terra-cotta and one of iron, showed the yield of heat per hour to be considerably greater for the iron than for the terra-cotta. Nevertheless, the latter raised the air to as high a temperature as was desirable, and, in consideration of its greater durability, may in some cases be preferred to the latter. It is particularly to be recommended in the lower story, when other distributors are used in the same smoke-flue in the stories above. If terra-cotta be used on the first story, iron should be used on the second, and, if the first cost were not too great, copper would be the best material for the third, as being the best heat-conductor, and therefore best able to draw from the smoke the remainder of its heat. Copper also is better able to stand moisture than iron, but is sooner destroyed by great heat. All things considered, stout sheet-iron is much the best material for our purpose, since our object is generally to extract from the smoke the maximum amount of heat at the least cost and in the smallest space. The cost of manufacture in terra-cotta is greater than in iron when the number required is small, but less when it is large.

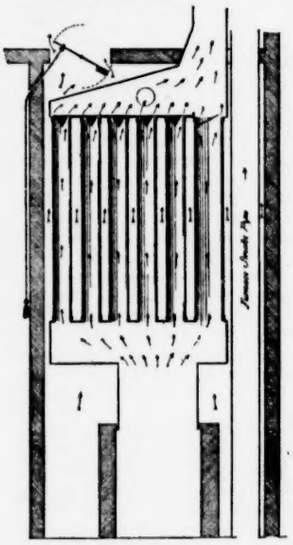


Fig. 188.

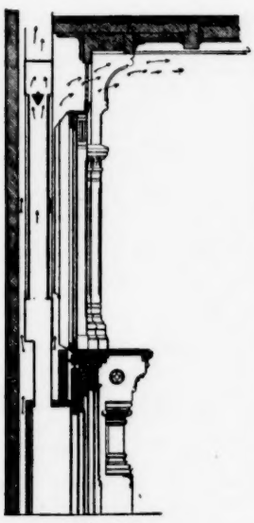


Fig. 189.

The form of the iron distributor is seen in Figs. 188 and 189. The connecting-pipes are all perpendicular. Five of these pipes are 15 cm. (six inches) in diameter, and stand 10 cm. (four inches) apart from each other; a sixth is 25 cm. in diameter. But all the upright pipes might be as large as the largest (increasing the dampers in proportion), and the heating surface would be so much greater. It is found most economical to make the upper and lower horizontal pipes rectangular in section and the connecting-pipes circular. Round pipes are cheaper than square, but the upper and lower pipes are made square to simplify the connection and facilitate the riveting. The perpendicular pipes require no clean-out holes when iron is used, because a smart rap on the pipe is sufficient to cause the caked soot to fall to the bottom. The upper horizontal pipe has a round clean-out hole in the centre of the accessible side. The hole is covered with an ordinary tight-fitting sheet-iron cover.

When these distributors are used in a smoke-flue, their size of course depends upon the amount of available space behind the chimney-breast. In general, no increase in the size of the breast beyond what is customary is necessary. In the lower stories where fire-places are most used, and where the distributor is most desirable, only a single smoke-flue is usually to be found behind the chimney-breast in addition to that of the fire-place in question, namely, the furnace-flue at one end of the house and the range-flue at the other. Nevertheless, on these stories chimney-breasts are usually boxed out to a width of two or more meters to give them an agreeable proportion, and to allow room for the mantel-piece and shelf, so that a space of one or two meters in width is generally utterly wasted. The distributor is built to just occupy this waste space; though if more room is desired, its width can usually be increased without injury to the appearance of the room. The projection of the breast into the room is not increased over what is customary. In order to permit of ready access to, or of complete removal of, the distributor at any time without injury to the surroundings or to itself, an opening is left in the front or side of the chimney-breast sufficiently large to allow of its removal and replacement in a single piece; the masonry above being supported by a brick arch, corbel, iron beam (as shown in Fig. 189), or by a heavy piece of flagging which may serve at the same time for the hearth of the fire-place above. The use of the flagging has the advantage of doing away with the need of the trimmer-arch and its header, and of leaving room for the safe passage of the ventilating pipe of the gas-chandeliers, the thickness of the flagging requiring seldom to be as great as the depth of the joists. The joists, usually morticed into the header, may be hung with irons to the outer edge of the flagging, which may be strengthened if desired, where the span is great, by an iron beam. In consideration of this advantage of allowing safe passage for gas-ventilators, and of dispensing with the brick trimmer-arch, and of the saving of tiles, face-brick, or marble, where the smoothed surface of the flagging is allowed to serve as the hearth for the fire-place above, the use of flagging does not necessarily add to the expense of the building, provided the plans are carefully and understandingly drawn before the work is begun. These openings in the masonry of the chimney-breast are then covered by hinged panels, which may be made as ornamental as circumstances and the skill of the architect will allow. The backs of the panels should, of course, be tinned, with proper air-space behind the tinning to avoid injury from heat radiation. With these precautions this arrangement of the smoke-flue renders it as much safer than the ordinary flue, as a double flue is safer than a single one, and justifies lowering the rates of insurance on houses containing them. When the side instead of the front of the chimney-breast contains the door, its decoration becomes, of course, comparatively unimportant, merely a moulding being required to cover the joints of the hinged panel. But openings of the requisite size are rarely practicable at the side, for the reason that the projection of the chimney-breast is insufficient, the flues usually retreating into the main wall.

Instead of the conical dampers shown in Fig. 188, when the draught is good, a simple sheet of iron of nearly the length and width of the horizontal pipe and containing a series of holes cut in it corresponding to the flues below, may be placed over the openings of the upright pipes to regulate the passage of the smoke. The position of the damper over the perpendicular flues regulates the amount of opening in each.

UNREST.[1] — II.

Now, the point I beg to submit to you this evening is, that it is to this despised and neglected "frame-making on a large scale," that we ought mainly to address ourselves, — to cultivate with assiduous care and make our peculiar study, as in that direction lies our special source of strength; that Mr. Ruskin's first idea was the right one, and that the sculpture and floral mouldings are in fact, and should be in design, subordinate to and not the masters of the architecture; that they may be, and often are, omitted altogether without detriment, and that when they become objects of absorbing interest they tend to rob our work of all its breadth, and nearly all its value. To put the main theory which I am combating to a practical test, let us apply it to those glorious Cistercian abbeys whose ruins adorn our land. The rule of their founders, as you know, forbade the introduction of ornament; and all that carving and illusive imagery which Mr. Ruskin says is the "all in all" was conspicuous by its absence, nor were those precious marbles used which he says are the only allowable substitute. Yet successive generations have borne testimony to the beauty and impressiveness of those exquisite works. It is idle to dispute about mere words — whether this be architecture, as we understand it, or "frame-making." It is the quality which we all should desire to emulate. What is it that impresses us on entering the nave of Canterbury or Durham or Chichester or Southwell Minster? Not the cushioned capitals more or less rude or ornate, nor the ruder attempts at surface ornament in the tympana of the triforium arches. Before we have time to peer into these, be they never so lovely, the power and majesty of the whole work falls upon us like a spell and awes us into reverence. Something, no doubt, is due to mere age — something to religion and historical associations. We are, nevertheless, by no means regardless of its general size and form. The "frame-making on a large scale" has done its work as nothing in the world beside could have done it, and the human mind is more amenable to its divine silences than to the eloquence of all the carving in the world. But we have now-a-days, as the early teachers had not, other teachers — multitudes of channels in which the stream of learning flows — endless appeals to our intellect and to our heart. But amongst all the resources for the elevation of the human mind, and amongst all the appeals to our imagination, there is still none so potent and so sure as that afforded by grand and noble architecture. To this grandeur and nobility I submit that mere excellence of detail contributes only in a secondary manner, and that in restricting our attention to it we run in danger of missing ends of immeasurably greater importance. May I adduce, in illustration of my general position, a "modern instance" which combines great wealth of detail with masterly grouping and general arrangement, and endeavor to assess the part played by each element in the general result? I refer, as you may guess, to the Houses of Parliament. I have always admired that building, and still think that, in spite of the hostile criticism with which it has been assailed, the new Palace at Westminster is, on the whole, the most satisfactory secular building which the Gothic revival produced. Yet one can never pass it without wishing that its great architect had left us some spaces of repose on its enriched fronts — some quiet pauses in the restless pageantry of its façades. Who, for instance, would not wish away from the clock-tower all that gilding and frippery which vulgarize its summit, reduce its apparent height,

[1] From a paper read at a meeting of the Architectural Association on April 23, by Mr. E. Ingress Bell.

and compromise its dignity by destroying its simplicity? Would not the whole structure benefit by the removal of half the cresting and brattishing, the wearisome iteration of panelled surface, and the multitude of small prettinesses which crowd every part of it from base to summit? As a consequence, we never quite know whether we like it or not. We discuss it, and argue about it, and hesitate to express a definite opinion. There is statuary, and there are floral mouldings enough in all conscience; but of these it cannot be said that we are "intensely observant." Without reviving a buried controversy, one may safely say, that if the hand of Pugin appears at all in the work it is in the details, and that, as a composition, it bears unmistakably marks of the genius of Barry. The value of the details diminishes every day, and we pass them by as a matter of course. The pretty parts of the building are, moreover, perishable parts, and already the crockets and finials are dropping away in decay; the vanes are dangling in shreds about the pinnacles, but the artistic skill evident in the general arrangement of building, as a whole, forms an element of permanent value, and as long as the river flows will appeal to the imagination with a force which the fluctuating fashions of the day cannot disturb or diminish. We do regard its general form and size, and herein lies its real power. We are charmed, in spite of the interstices, by its varied sky-line, by its "Crown of Towers," by the play of light and shade — the heightened *chiaroscuro* which the opacity of a London atmosphere imparts to a building so picturesquely varied in outline and mass, and of such considerable extent.

I may perhaps be excused for bringing to your remembrance certain broad principles of art laid down by Sir Joshua Reynolds in his excellent discourses, which are too often overlooked by architects of the present day. You are doubtless familiar with them, and will anticipate what I am going to say. Yet, at the risk of wearying you, I cannot refrain from referring especially to the advice contained in his eleventh discourse. It is dangerous, I know, to apply the dicta of one branch of art to another, yet in this case the analogy between the "finish" to which he refers, and the "details" in the sense in which I have used the word is complete, and his warnings and advice will, I submit, apply with undiminished force. "The highest finishing," he says, "is but labor in vain, unless at the same time there be preserved a breadth of light and shadow." This is from the Notes on the Art of Painting. Again, "I have observed that an excessive labor in the detail has nine times in ten been pernicious to the general effect, even when it has been the labor of great masters." And again, "It is in vain to finish ever so minutely the parts, if the *masses* are not observed, or the whole is not well put together." The same formula variously expressed runs through all his work; and the lesson which he is never weary of enforcing is that you must design or compose on broad lines to achieve satisfactory results; that you must work down from large to small, and must not be distracted from your main purpose by undue solicitude about subordinate parts.

I believe that our habit of working in pen and ink, with the point rather than with the brush, has much to answer for, and that the sooner we abandon or modify the practice the better. The details, the finish of our works, are more likely to engage our attention in the former case, while broader considerations are likely to be a concomitant of the latter method. In any case we should keep well before us the advice of Sir Joshua Reynolds, and the examples of the successful works of our ancestors. I know, of course, how easy it is to prescribe and how difficult it is to achieve. It is something, however, towards arriving at the goal if we feel sure that we are on the right road: such a road I think is to be found in the considerations I have ventured to urge upon your attention. In conclusion, I am happy in being able to quote a stray passage from the most distinguished art-critic and brilliant writer of the day. You will recognize the incomparable style, and you will, I hope, indorse the sentiment embodied. "While it is not to be supposed," he says, "that mere size will ennoble a *mean* design, yet every increase of magnitude will bestow upon it a certain degree of nobleness. So that it is well to determine at first whether the building is to be markedly beautiful or markedly sublime, and if the latter, not to be withheld by respect for smaller parts from reaching largeness of scale. Let the architect who has not large resources (and I should be tempted to add also, let him who has) choose his point of attack, and if he choose size let him abandon decoration, for unless they are concentrated, and numerous enough to make their concentration conspicuous, all his ornaments together will not be worth one large stone. And the choice must be a decided one and without compromise. It must be no question whether his capitals would not look better with a little carving — let him leave them huge blocks: or whether his arches should not have richer architraves — let him throw them a foot higher. A yard more across the nave will be worth more than a tessellated pavement, and another fathom of outer wall than an army of pinnacles."

THE ILLUSTRATIONS.

HALL FOR THE REPUBLICAN CONVENTION AT CHICAGO, ILL. MR. W. W. BOYINGTON, ARCHITECT, CHICAGO, ILL.

For a description of this building, see the letter of our Chicago correspondent in the next column.

COMPETITIVE DESIGN FOR THE Y. M. C. A. BUILDING, LYNN, MASS. MR. J. H. WETHERELL, ARCHITECT, BOSTON, MASS.

BUILDING ON THE ESTATE OF PIERRE LORILLARD, ESQ., NEWPORT, R. I. MESSRS. PEABODY & STEARNS, ARCHITECTS, BOSTON, MASS.

The perspective view of the main house and some of its interior details were published in the *American Architect* for July 6, 1878.

CORRESPONDENCE.

THE NEW AMPHITHEATRE FOR THE REPUBLICAN NATIONAL CONVENTION.

CHICAGO.

When the National Republican Committee met at Washington in February last to determine upon the time and place for holding the National Convention of 1880, a voluntary committee of citizens of Chicago guaranteed to build a hall free of expense to the National Committee and capable of seating ten thousand people, provided the Convention should be held in this city. The offer was accepted, and June 2 was the time appointed for the meeting. Accompanying this liberal offer was a sketch made by Mr. Wm. W. Boyington of this city, showing how a part of the Exposition Building, in which our annual industrial exhibitions are held, could be used. Mr. Boyington was also the architect of the building, which was built in 1873.

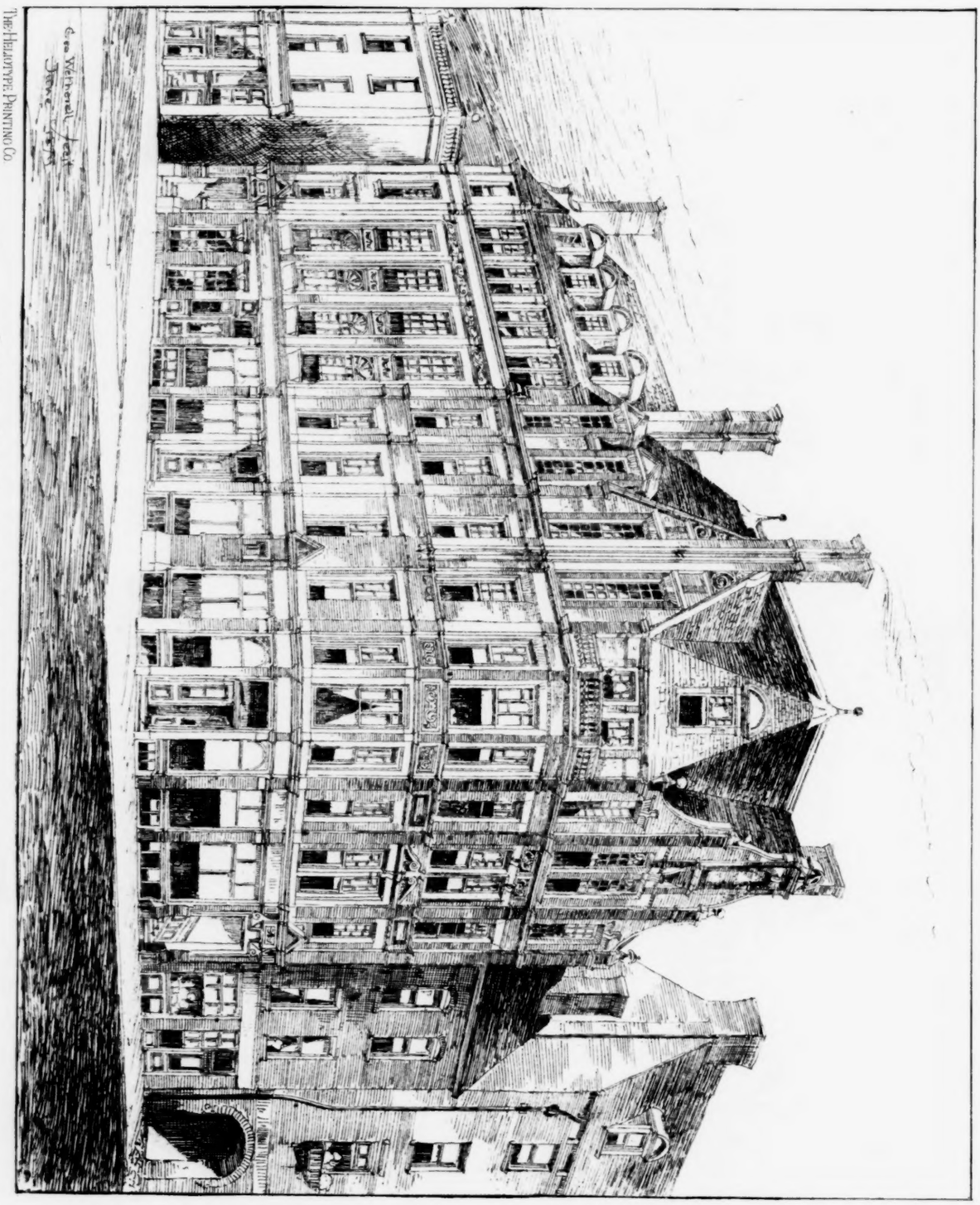
After Chicago was selected, Mr. Boyington, the architect, made the carefully designed plan which has been carried out. The money required was subscribed by the railroad companies entering the city, the leading hotels, and prominent merchants, without regard to party predilections. But in order to prepare the building for this work as well as for its other uses, the Exposition Company decided to make extensive alterations and improvements. Many of the floor timbers had decayed, the floor itself needed renewing, and the heads of the piles on which the Howe arched trusses rested had many of them also decayed. It was also decided to change the form of the main roof, to remove the flat skylights and to substitute vertical lantern windows. The aggregate area of the glass in these additional windows is over twenty thousand square feet. The roof, which was formerly an arc of a circle, was given an ogee form, and the alteration was made in a novel and economical manner. The roof boards above the old skylight line were not removed, but the rafters supporting them were cut loose from the trusses and lifted up by main strength. The natural curve of the boards and tin became the permanent curve of the roof.

All the piles on which the trusses rest were cut off six feet below the level of the ground. They were then exposed six feet lower and surrounded by concrete six feet in depth. Then a stone pier was built from the tops of the piles to the ends of the trusses. The trusses have a span of 150 feet, and all of them had to be shored up. The main building is 800 feet long and 200 feet wide. The art-gallery, conservatory, and agricultural machinery annexes make it cover 300 by 1,200 feet. The alterations and renovations of the building cost the company $30,000 and required six weeks to carry out.

The amphitheatre for the Convention occupies the south half of the main hall. The portion used by the Convention for meeting, telegraphing, ante-rooms, etc., is 200 by 400 feet. The amphitheatre occupies the whole of the space between the roof trusses, which rest on the ground, and is 150 feet wide and 375 feet long without a column or obstruction of any kind. The south end behind the stage is a semicircle. The north end is a half octagon. The lowest point for seats is that occupied by delegates on the original floor level. The highest point is at the sills of the new lantern windows, which surround the hall on all sides except the north. Over the hall are one full dome and one half dome. The dome over the stage is cut off by immense sheets of blue bunting with white stars, from which extends along the top of the room an immense piece of red and white bunting to the west end, and thence down to the top row of seats. It forms a sort of decorative American flag 300 feet long. The stage consists of two parts. In the centre is the rostrum for officers; surrounding it, raised one foot higher and separated from it by a low railing, is the stage for distinguished invited guests. In front of the officers' stage and a little lower down in a sort of orchestra is the place for ninety-two short-hand reporters. On each side of the reporters' stage are the main entrances to the stage and delegates' section which pass in front of the three telegraph offices. The Western Union Telegraph has forty wires entering the building and one hundred and sixty instruments. The American Union Telegraph Company has twenty-two wires, and the Atlantic and Pacific a smaller number. The operating rooms are under the rising banks of seats on each side of the stage. The delegates occupy 756 seats immediately in front of the reporters; behind them are 756 seats for alternates, and behind the alternates are 702 more seats on the main floor for the public. These are all on the main floor, which rises on a rapid slope from in front of the reporters' stage. The rising bank of seats surrounds the entire floor and stage on all sides. The semicircle behind the stage is reserved for ladies, and on the right are 477 seats for members of the press other than short-hand writers.

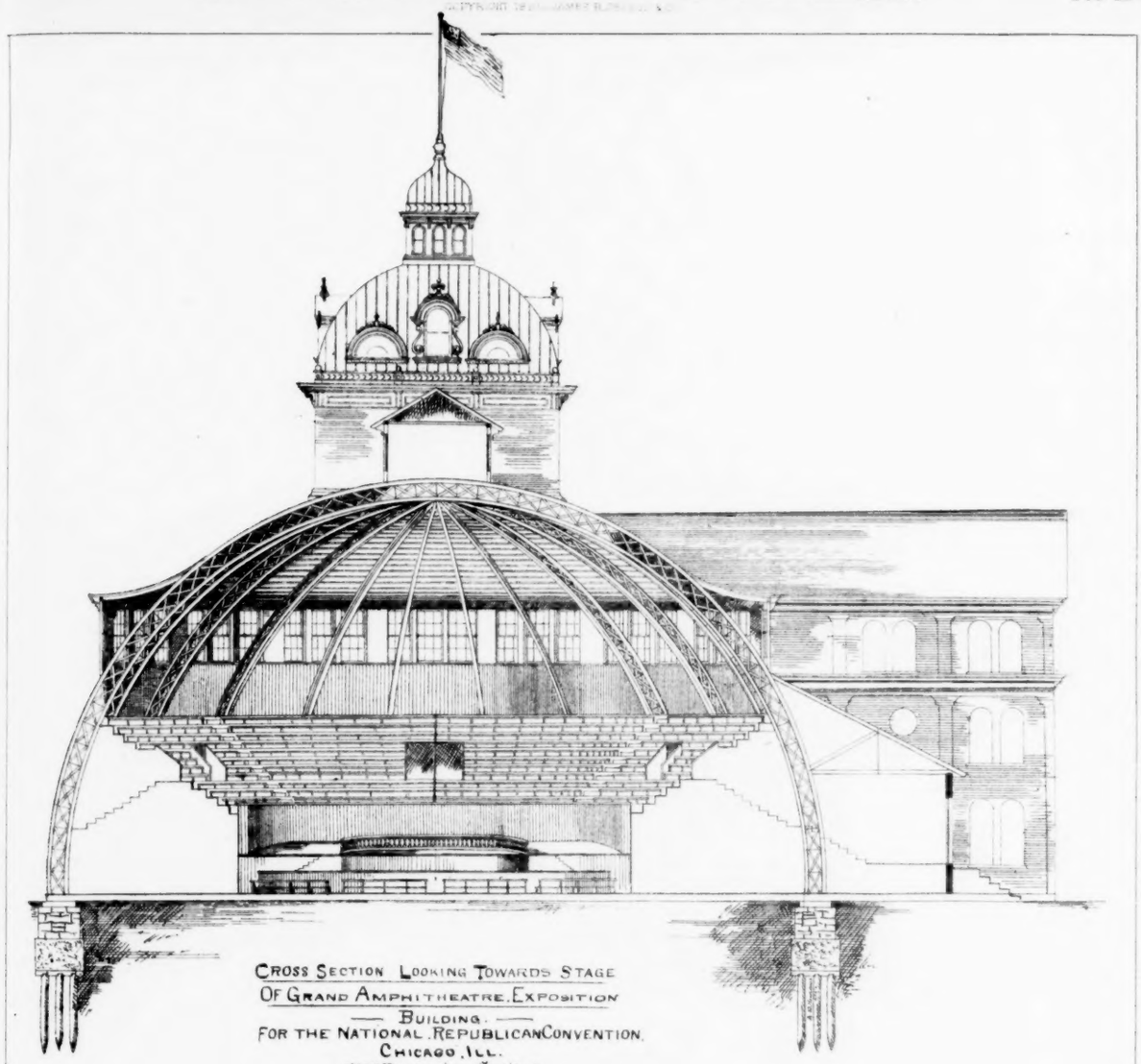
The seating capacity of the house is as follows: —

Stage	550
Short-hand reporters	92
Main floor, Delegates	756
" Alternates	756
" Section A	702
Ladies' gallery, section B & Q	1,585
Press gallery " P.	477
Band gallery "	44
Galleries C, D, E, F, G, H, I, J, K, L, M, N, O	4,914
Total seats	9,876

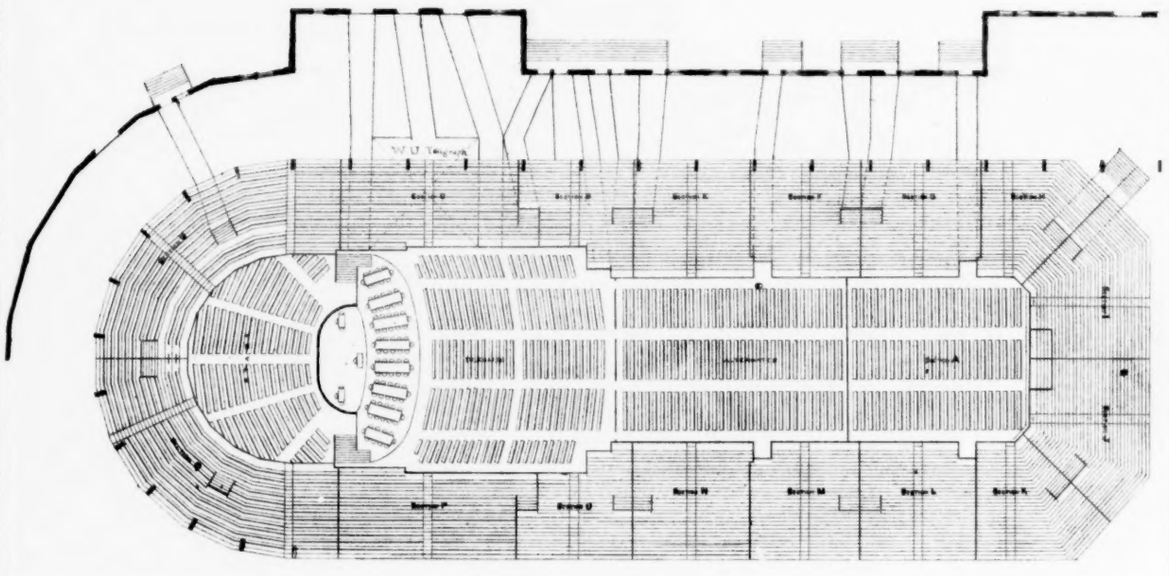


THE HELIOTYPE PRINTING CO.

SKETCH DESIGN FOR Y. M. C. ASSOCIATION AT LYNN.



CROSS SECTION LOOKING TOWARDS STAGE
OF GRAND AMPHITHEATRE, EXPOSITION
— BUILDING. —
FOR THE NATIONAL REPUBLICAN CONVENTION.
CHICAGO, ILL.
W. W. Boyington Architect
Chicago Ill.



THE HELIOTYPE PRINTING CO.

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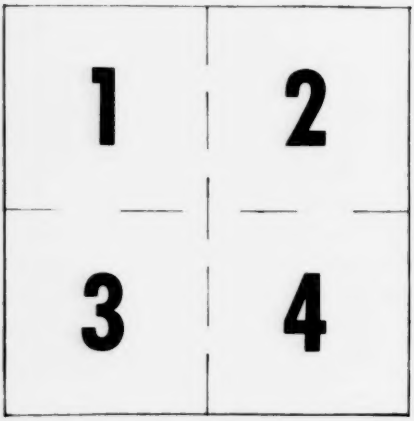

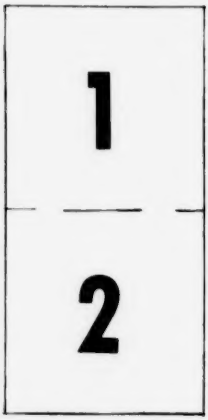

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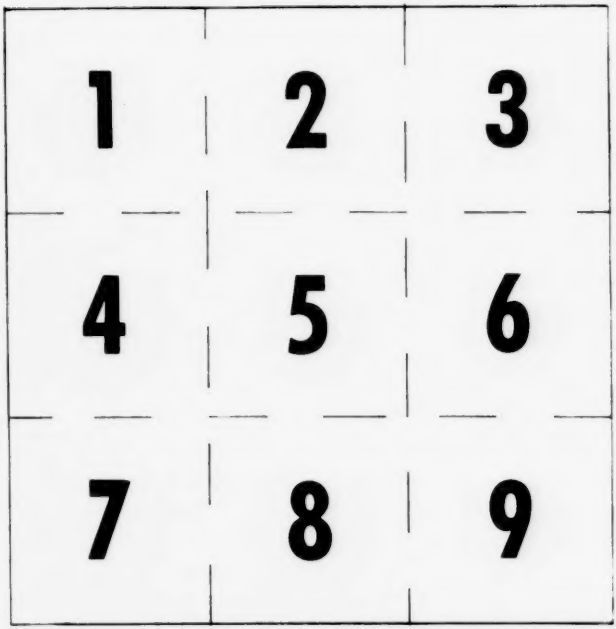
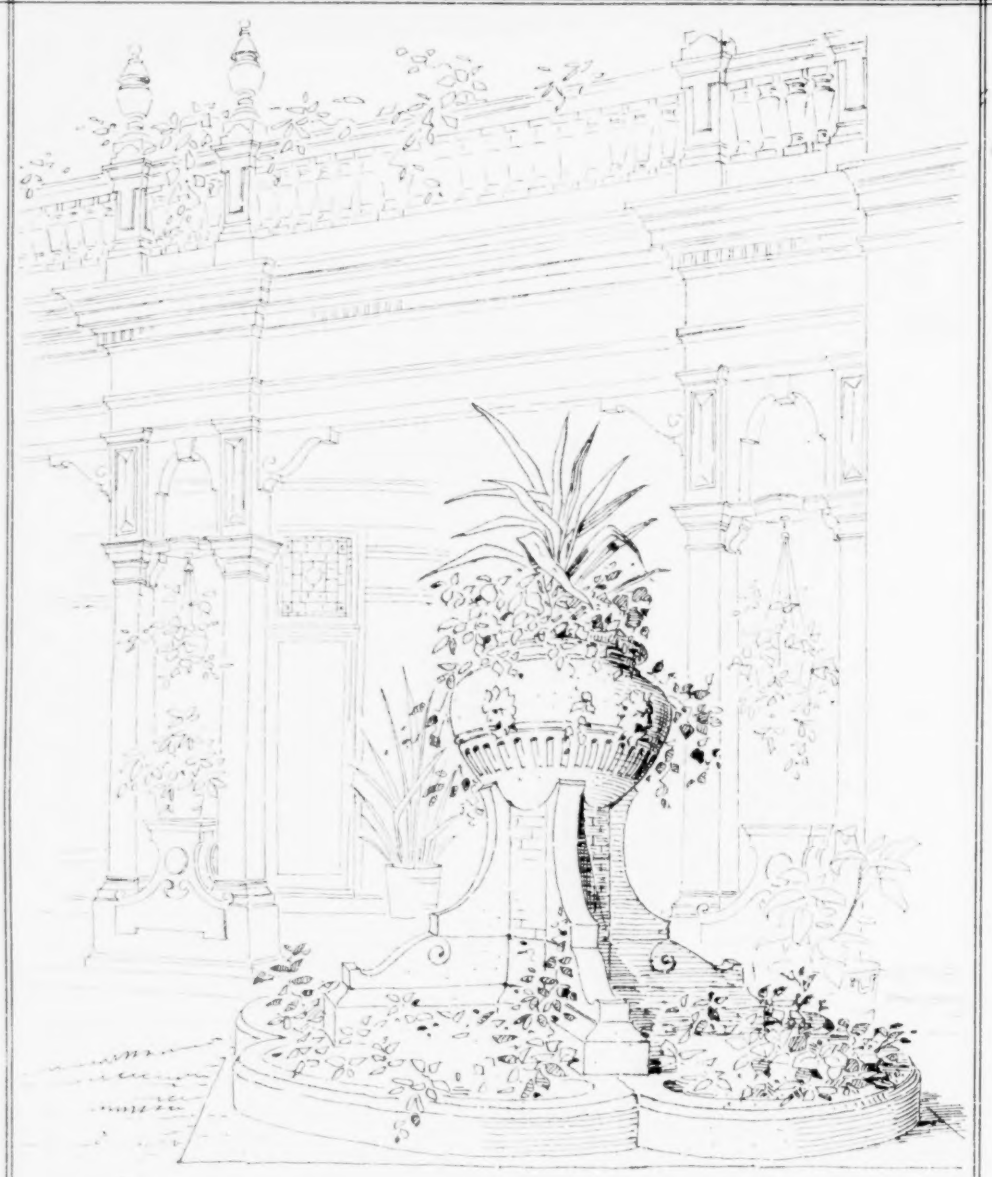
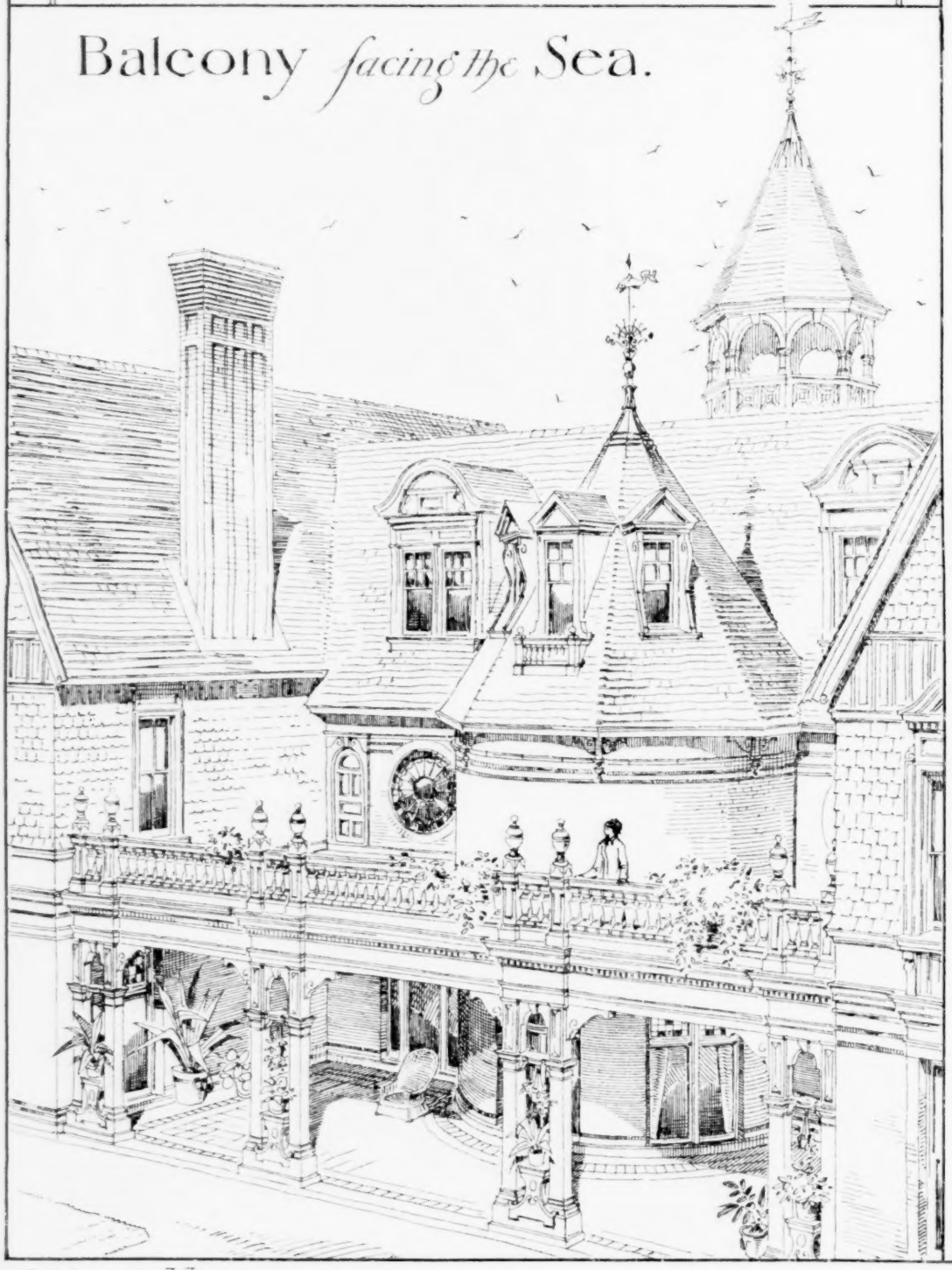




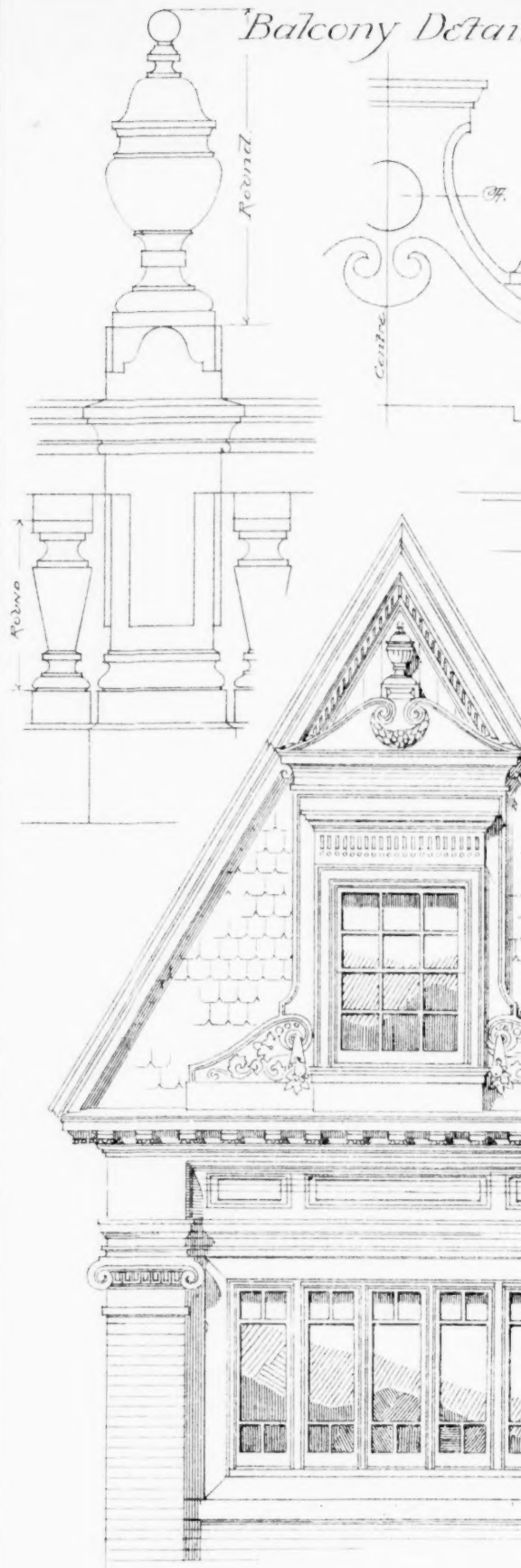
Flower Vase.

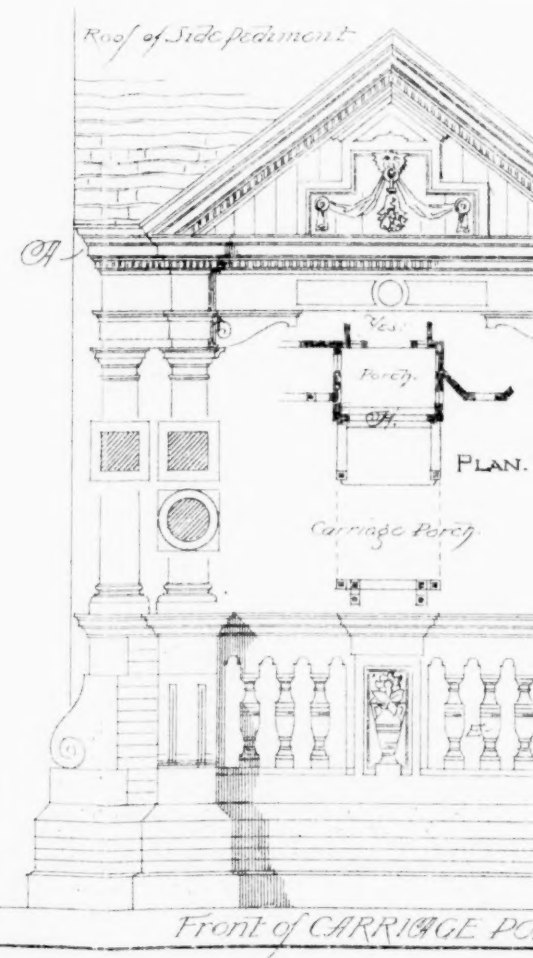
Balcony *facing the* Sea.



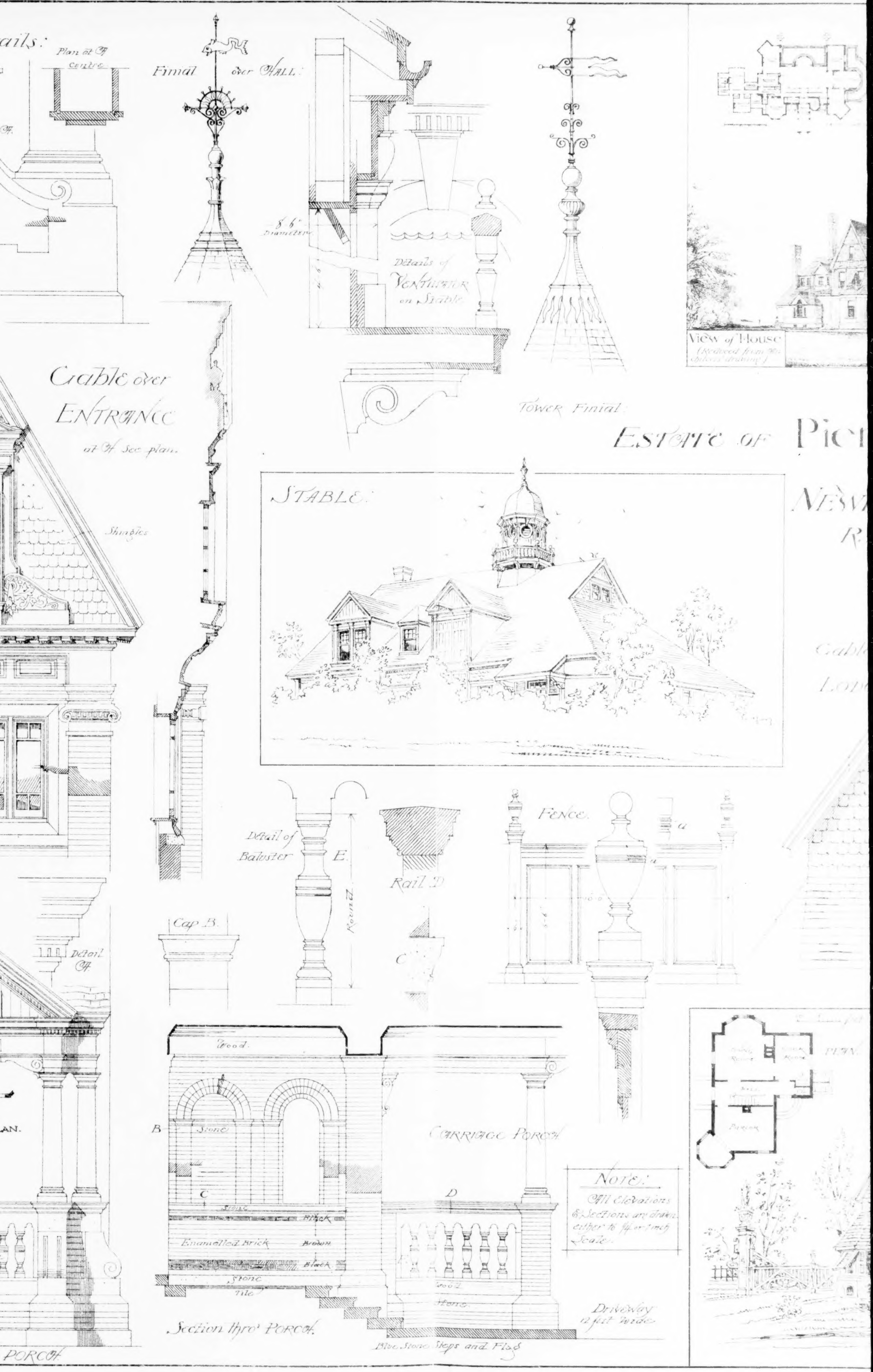
D. A. Gregg. del.

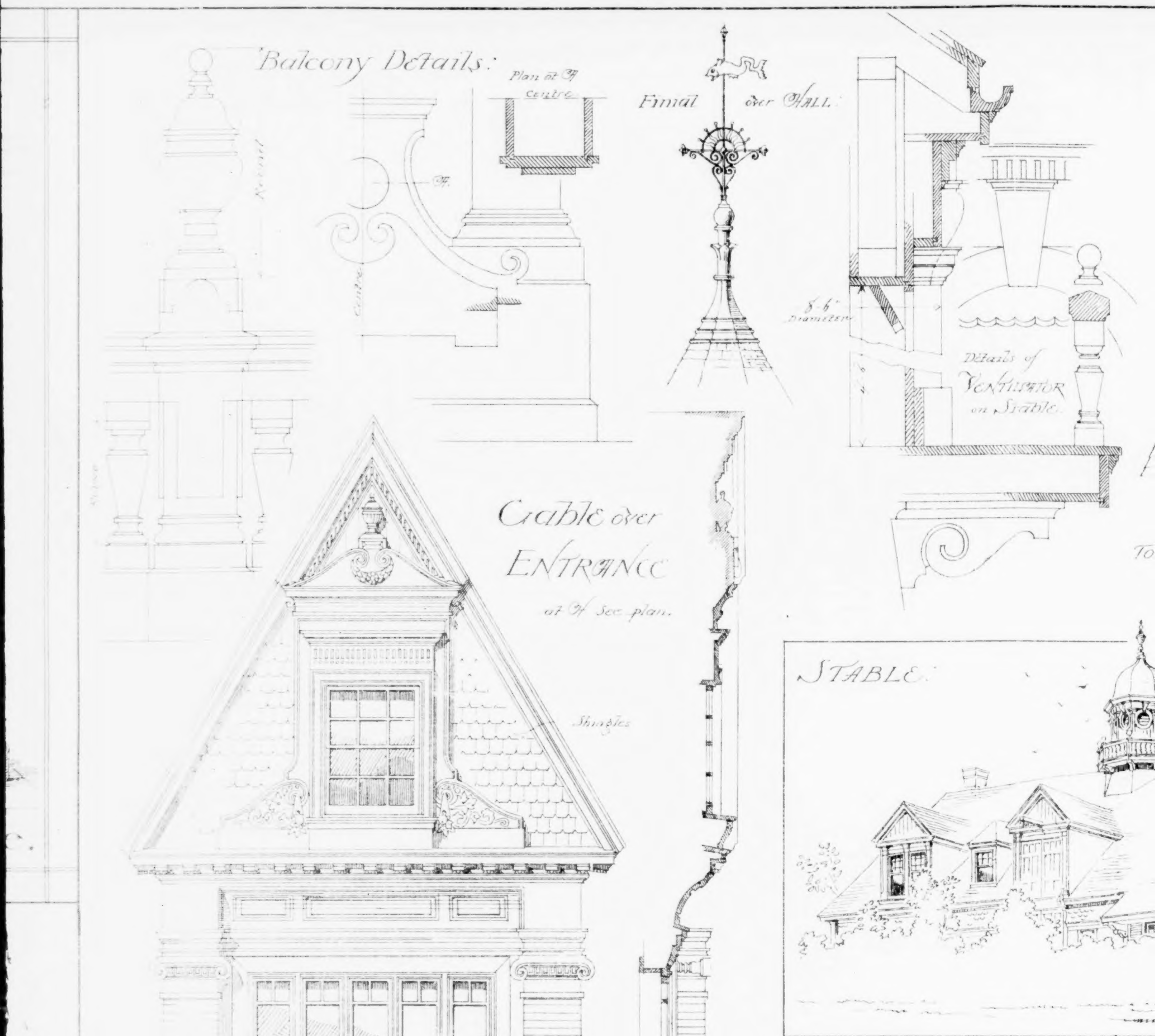
Balcony Detail



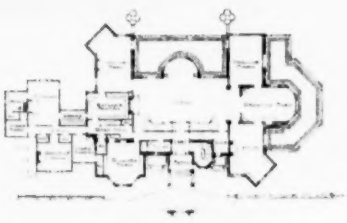


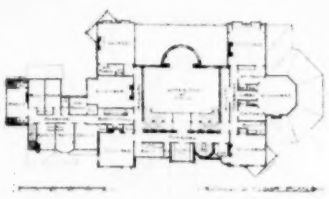
Front of CARRIAGE PO


Final over HALL.
Details of VENTILATOR on Stable
TOWER Finial.
View of House
Gable over ENTRANCE
Shingles
STABLE.
Detail of Baluster
Rail D
Cap B.
Fence.
Wood.
Stone
Enamelled Brick
Section thro' Porch.
CARRIAGE PORCH
Note: All Elevations & Sections are drawn either to 1/4 or 1 inch Scale.
Driveway 12 feet wide
Blue Stone Steps and Flag
PORCH
Parlor


Balcony Details:
Plan at A
Centre
Finial over HALL
Details of Ventilator on Stable
Gable over Entrance at A See plan.
Shingles
STABLE
Detail of Baluster
E.
Rail D.
Cap B.
Detail A
Plan.
Porch
Carriage Porch
Wood
Stone
Carriage Porch
Enamelled Brick
Brown
Black
Tile
Section thro' Porch
Front of Carriage Porch
Blue Stone Steps and Flag

Tower Finial.



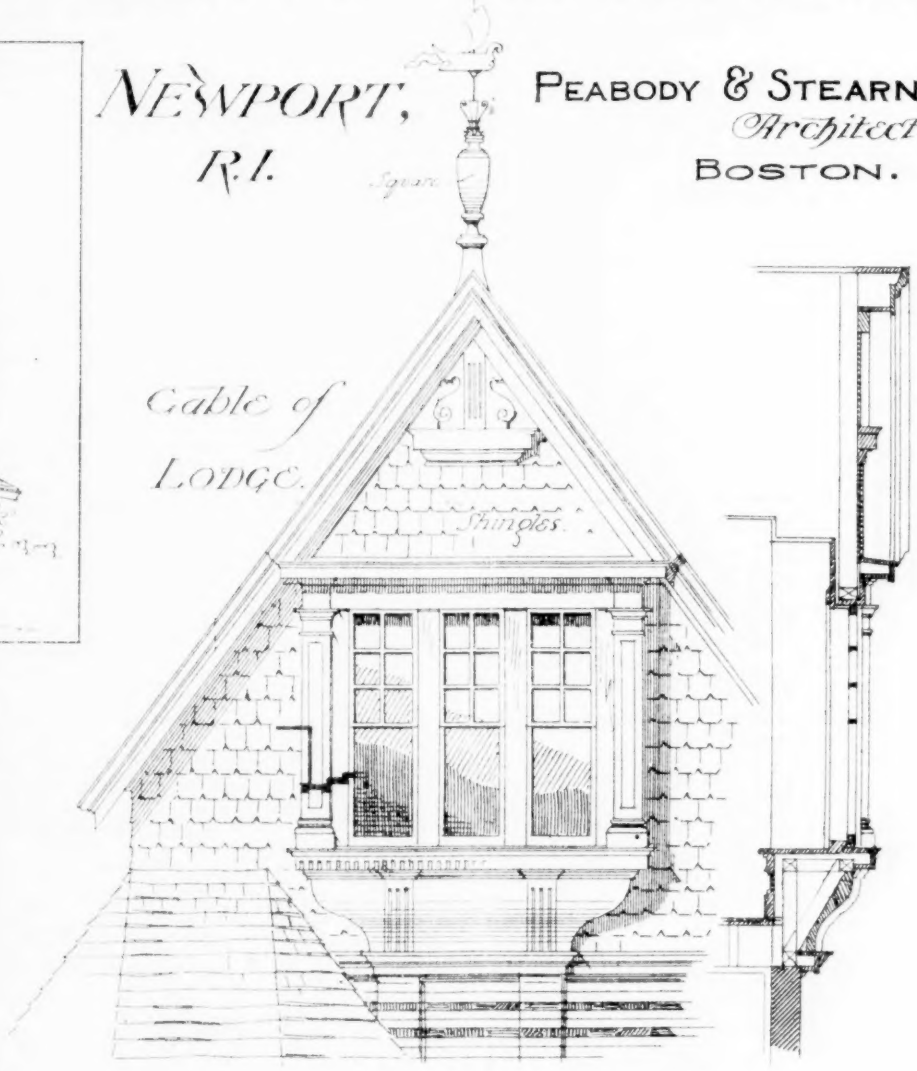


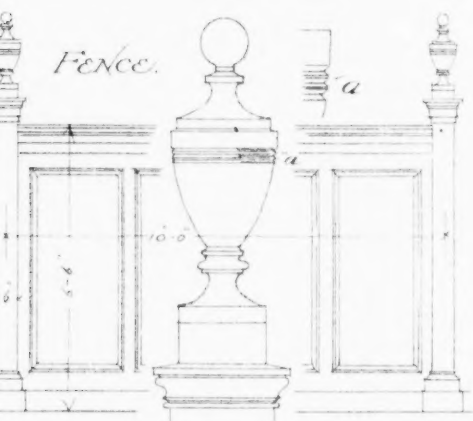
View of House
(Reduced from Architects' drawings)

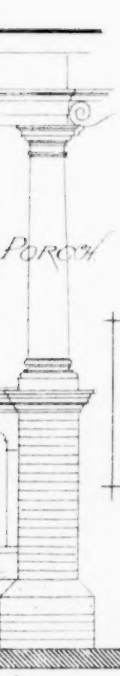
ESTATE OF Pierre Lorillard Esq.

NEWPORT, R.I.

PEABODY & STEARNS,
Architects,
BOSTON.







NOTE:
All Elevations & Sections are drawn either to ¼ or ⅛ inch Scale.

Driveway
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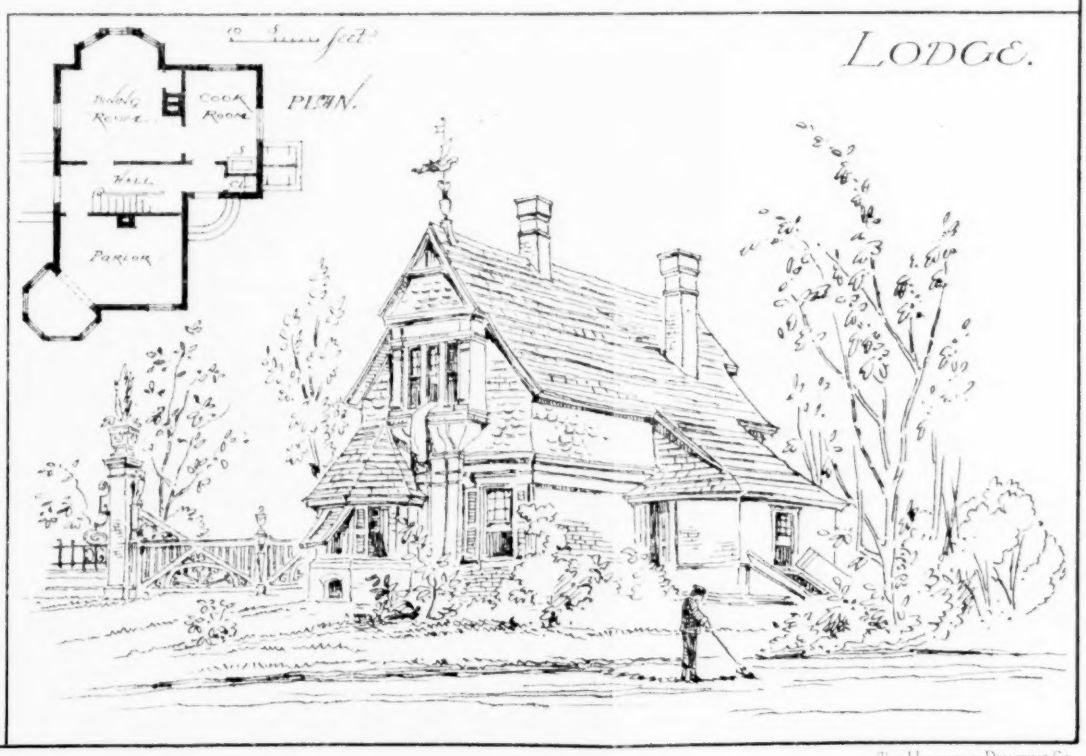


THE HELIOTYPE PRINTING CO

The Convention Amphitheatre is entirely constructed within the Exposition Building — that is to say, there is nothing visible of the original building from within, except the lantern windows and the arched roof. This immense room is unimpeded with columns, and has no overhanging galleries. Notwithstanding its great length every seat has an unobstructed view of the stage. Your correspondent had an opportunity to test its acoustic properties a week ago. It was found that a voice could be heard the entire length, with but slight elevation above a conversational tone. It was tested from many points with satisfactory results. The value of only a low and curved background not more than seven feet high was practically demonstrated. There are several points in the hall from which this could be illustrated. The effect will doubtless be much better when it is filled with people.

The Citizens' Committee procured the use of the Exposition Building free of rent. It has constructed this immense hall for the remarkably reasonable sum of $7,000. The work was done by contract with the stipulation that the lumber is to be returned to the contractor. Immediately after the convention it will be taken down, and become a thing of the past. There are some ingenious features about it; one is, that where the seats have no backs and are arranged in what might be called circus fashion, the treads are divided into two parts by a strip of two-by-four lumber nailed in the centre of each. Between this and the riser are two inches of sawdust. This serves the double purpose of deadening the sound of feet and furnishing a continuous cuspidore in front of every seat. Where the seats have backs, and in the aisles, the entire floor is covered with two inches of sawdust. Every seat in the house is numbered, and all the tickets will be coupon tickets, entitling every one to a reserved seat. Every lettered section has a separate entrance from the outside, and no one can pass from one section to another except on the ground-floor and the stage. There is an abundance of committee-rooms, and a restaurant is in the building. There is a conservatory where exhausted orators may lounge and recuperate, and a counter where they may moisten their parched throats.

All this has been accomplished within six weeks from the 15th of April. The building was formally accepted by the sub-committee of the National Committee on the 26th of May. Of the decorations it is hardly necessary to say anything except that they consist mainly of arrangements of national flags and bunting, about five hundred flags having been used. There are twenty-six exits and entrances averaging six feet each, or having a total width of one hundred and fifty-six feet. As for the construction of the building your readers can judge best from the illustrations sent to you.

What is most remarkable of all things in relation to this structure is the fact that so many of the conditions of a perfect auditorium and hall for public gatherings have been fulfilled in a building to stand for one week only, and larger perhaps than any similar building heretofore erected, while so many buildings of a permanent character are going up every day where these essential conditions are neglected and forgotten. But the reason for this is evident, when we see that the whole scheme is the result of an intelligent plan conceived and carried out under the eye of its author, untrammelled by a would-be superior authority. The credit and the responsibility rest mainly upon the shoulders of the architect.

NOTCHING JOISTS BY GAS-FITTERS.

MR. ALEXANDER BLACK, an architect, of Keokuk, Iowa, writes as follows to the *Metal Worker*: —

"As the *Metal Worker* is read by many gas-fitters, I wish to use its columns to disseminate among them a needed warning against the very pernicious and wide-spread practice of notching joists on their upper edge through the middle of floors, in order to make short cuts for laying pipes to drop-lights. This custom is very common, especially in the West. In my own practice I have had immunity from this vexation for several years, as the established gas-fitters in this vicinity know I will not permit notching at a greater distance than two feet from bearings. This week, however, I encountered the same old annoyance. A new man had been put to work in a building under my charge, without my knowledge, and before my daily visit, had notched down 1½ inches into all the joists across the middle of the floor. On being questioned if he was aware of the injury he had done, he replied that such a small notch could not weaken the joists much, and that he and all other gas-fitters with whom he was acquainted had always notched across the middle of floors to reach drop lights. He could not realize it when I explained that the 1½ inch had not only reduced the effective vertical depth of 12-inch joists to 10½-inch — or, in other words, had diminished their vertical depth one ninth part — but that their stiffness or strength to resist bending or sagging was really reduced one third part; that is, the notched joists only retained two-thirds of the stiffness they possessed before being notched in the middle of the span. Of course such a large decrease of strength could not be permitted, and must be restored by the simplest means. Accordingly, as the top part of the joists is in compression, I directed that the notches be carefully filled with hard wood, tightly wedged, and I presume that the contractor will allow the gas-fitter to reap the benefit of the lesson he made for himself.

"It is essential that gas-fitters — indeed all building mechanics — should know that the stiffness or resistance to sagging within an elastic limit varies directly as the cube of the vertical effective depth, the length and breadth of the beams of the same materials being alike in the different pieces compared. That is, if one joist be two or three times as deep as the other, the breadth and span being alike, it will be 8 or 27 times (cubes of 2 and 3) as stiff as the other. In the instance cited above, the cube of the depth, 12 inches, is 1,728, and the cube of 10½ inches, the effective depth to which the 1½-inch notch in the middle reduced the 12-inch joist, is 1,157.625; substracting this latter figure from the former, we find the reduction equal to 570.375, which in even figures is one-third of 1,728 — the sum representing the original. By elastic limit in the above description is meant that condition of beams when their deflections begin to increase more rapidly than their loading increases for each equal addition to the load. The beam or joist may be considered as beginning to break when this limit is reached.

"The stiffness which is the essential condition of floor-joists must not be confounded with their ultimate strength or resistance to breaking; the extent to which sagging or bending of floors may be permitted without being prominently noticeable or causing plaster ceilings to crack, is one-fortieth of an inch per foot of span. Joists usually are made crowning to this extent, in order to compensate for sagging. I may note that the ultimate strength of beams of same materials and of like length and breadth, but of different vertical depths, varies directly as the squares of their effective depths."

VENTILATION OF SEWERS.[1] — I.

ALTHOUGH the sewage should not be allowed to remain long enough within the sewers to undergo much decomposition, yet much of the sewage is, when admitted, partly decomposed, and as more or less of its impurities continually adhere to the walls of the sewers from day to day, it is important that the gases evolved from such decomposition should be removed. In fact, without efficient ventilation the sewers very soon become public nuisances rather than benefits. They are in that case the active and efficient agents for the rapid diffusion of disease, from house to house, from street to street, and from quarter to quarter of a great city. In using the sewers for the removal of liquid refuse we have had the help of the force of gravity; but in dealing with these gaseous products this force turns against us, and works the other way, impelling the noxious gas upwards towards the branches and inlets whence the sewage came, or up any lateral street sewer the course of which lies in a convenient direction. If ample means are not provided for replacing these gases by fresh air, the process goes on and accumulates them in large volume, and these gases, impelled by the well-known forces of diffusion and gravity, seek and actually obtain entrance to every house with which the sewer has connection. Very few of our houses have traps outside their walls in their main-drains, and even where they have, this gas has the power of passing slowly through the trap water by absorption, to be given off again on the other side, whenever it accumulates to such an extent as to largely replace the common air in the sewer or drain. The insidious nature of such an enemy is one of its worst characteristics, for it acts by invisible agencies. The worst of these gases can hardly be detected by the sense of smell, the only sense with which we are endowed having any semblance of the function of the watch-dog in guarding us against such attacks. Individual action on the part of the house-holder is quite powerless against this evil. No system of traps, even if employing all the patents now on record, would suffice to stop it. Neither is the perfect ventilation of the house-drain itself, however important, able to cope with the lack of ventilation in the sewer. The office of house-drain ventilators is local only, and can never relieve to any appreciable extent, the want of ample change of air in the sewers themselves, even if it were safe to adopt such a course. Some cities have attempted to remedy the trouble by connecting the rain-water spouts of the houses directly with the sewers, so these pipes could act as sewer-vents, and I have myself at a former time vindicated such a practice under certain limitations. But this remedy is plainly inadequate to the duty assigned, besides endangering the houses themselves. Its inadequacy is seen when we consider that the gases from the sewer are most apt to invade houses during a heavy rain. The volume of rain-water entering the sewer at such times is often very large in this climate, where two inches of rain have been known to fall in a single hour in a summer shower. The influx of this large volume of water must of course displace an equal bulk of gas, for it cannot absorb or dissolve it without a good deal of time, and then only to a limited extent. Other parts of the sewer, down below the hills, are often at such times running full, perhaps more than full, and running under a pressure, while the outfall is perhaps beneath the surface of the river or tide-water into which it discharges, thus sealing the outlet for gas. Of what use at such times are the rain-water spouts? Every one of these is adding to the pressure, not only by bringing in new volumes of water, but of *air* too; for though the vertical leaders on the house-fronts do not run full, the current through them is so rapid that the air is pulled along with the water into the sewer by friction.

The danger to the house from using rain-spouts as sewer-vents is manifold. The workmanship of such pipes may be defective in the beginning, as it often is, for it is not considered important to make

[1] A lecture by Mr. Edward S. Philbrick, C. E., delivered before the students of the Massachusetts Institute of Technology.

This lecture, although delivered in this course, was published essentially in its present form in the *Sanitary Engineer* some two years ago.

rain-spouts *air tight*. However tight in the beginning, defects would arise from corrosion, giving escape to the foul gas perhaps close to windows of sleeping-rooms, without notice. Moreover, if put together in the most perfect manner, and kept in good repair, such pipes have open tops at the eaves, generally close under the windows of attic chambers, where they may deliver the poisonous gas to the lungs of some person whom sleep has rendered peculiarly liable to the attack. Such a device for ventilating sewers is at best but a makeshift, and for the above reasons is likely to do quite as much harm as good to dwelling-houses. The character of the poisonous emanations from sewers is not definitely known. What is most to be dreaded in this way is contagion from diseased discharges. We have in city sewers a grand laboratory for such matters. They are here mixed up from all sources and diffused at random, being liable to contaminate with disease whole districts which had otherwise been unvisited by contagion, and polluting the homes of the most cleanly of the population with emanations of the vilest sort. Such enforced contact with our neighbors as comes necessarily with city life is quite bad enough at best. This would be adding to the necessary exposure of the street-car, the school-room and the theatre the refined and ingenious device of inoculating disease by delivering the dangerous influences from a thousand privies and sinks, by metallic tubes opening under the chamber windows of such of our population as are unlucky enough to be obliged to sleep in an attic!

Before discussing the remedies for the collection of noxious gases in sewers, it may be best to consider the natural forces which are at work in the sewers with which we have to deal. First of all we must divest ourselves of the notion that air or gas of any kind can be readily pushed aside and got rid of inside of a sewer, as it can be above ground, where we are familiar with it. So long as air circulates freely in all directions, we are apt to forget its material and substantial character. We know, though we do not always keep the fact in mind, that the air is always exerting an expansive force of some 14.6 pounds per square inch, in all directions, as the reaction under the weight of the fifty miles or more of air above our heads. This is subject to small variations, but never exceeding about 10% of the whole in any one place. This variation is shown by the height of the barometer, and is subject to those hidden causes which we know very little about. So long as the air in our sewers is allowed free communication with the outer air at frequent intervals of space, no difference can exist between the tension of the air within and without; but the moment we obstruct such communication, various causes begin to act, either separately or combined as the case may be, to produce a different tension. Among these causes the following are prominent: —

(*a*) Change of temperature within the sewer.

(*b*) Introduction of water by rain-fall, or by flow of tide, or locally in small sewers by the influx of sewage-water in considerable volume from the neighborhood.

(*c*) Wind-pressure, exerted by winds blowing in at the outfall.

(*a*) Sewers are generally too deep below the surface to be much affected by the changes of temperature of the outer air, except by direct circulation of air through openings. When not disturbed by other influences, their temperature, without ventilation, approaches the mean temperature of the climate, say about 48° or 50° in this latitude. Suppose then, an influx of water to take place from some manufacturing establishment, as is often the fact, heated to 100° Fahrenheit. During the process of cooling the water does not seem to fall in temperature as fast as the air rises. A cubic foot of water weighs about as much as 815 cubic feet of air, while the specific heat of air is less than one-quarter that of water (about 0.238). It follows that when water is cooled by air in contact with it, a cubic foot of water in losing one degree of temperature will heat $\frac{815}{0.238} = 3{,}420$ cubic feet of air one degree on the same scale, or 342 cubic feet will be raised ten degrees. It may be said that the water is cooled in part by contact with the walls of the sewer. Very true; but water has more specific heat than any substance we have to deal with, so it is able to heat an equal volume of bricks, mortar, and earth about 2½° Fahrenheit for every degree it loses thereby. Hence, although the surplus heat of the entering water would eventually all be taken up and scattered in the surrounding soil, this process would occupy a considerable time, during which the air in the sewer would perhaps be temporarily heated some thirty or forty degrees. What would be the effect of this? Air expands about $\frac{1}{490}$ of its own volume for every degree of additional heat we impart to it; so that if heated 24½° we add 5% to its volume at equal pressure, or 5% to its pressure if confined within the sewer at a constant volume. The normal tension of the air is equivalent to about thirty-four feet of water-pressure, as is well known by any one who tries to lift water by pumping. Hence an accession of 5% to its normal tension by raising its temperature 24½° is equal to 5% of thirty-four feet, or 1.7 feet, say twenty inches of water-pressure. None of our traps are sealed by over six inches of water at most, and rarely by more than two or three inches. We have, then, an expansive force more than three times as great as the power of resistance of even a six-inch trap, produced by heating the confined air 22½°. The force developed by heating it 7° would then render worthless any trap having less than six inches depth of water-seal. It will readily be seen that many causes may produce such a change of temperature.

Of course the *lowering* of the temperature by an equal amount would produce an equivalent effect in the other direction, and tend to force the traps from the houses outward, which would often break their seal by taking out their water.

(*b*) The next disturbing force mentioned was by the introduction of water, from rain-storms, of tides, or increase of flow of sewage. Of these, the first two are generally fitful and in large quantity. In our country the rain-fall is generally admitted to the sewers, and their sizes are therefore adjusted to receive it. But the maximum flow of sewage is so small in comparison with that of the rain-water in our climate that the ordinary dry-weather flow is but a driblet when compared with their contents when running full. Such rains as may fill them often come suddenly, and the water enters the sewer at intervals of a few hundreds of feet, by trapped openings, which prevent the exit of air. Sewers that have a limited slope are often nearly or quite filled for considerable lengths. The entrance of water from the streets in such volumes must summarily expel the air that was before in the sewers, if it can find any way to get out. It may often happen that a long sewer is at such times filled with water at two separate parts of its course, while some intermediate portion, having a more rapid fall, may not fill so soon. If the influx of water continues to increase, the air in this portion may soon become subject to a pressure of several *feet* of water and seek exit through every private drain that is in connection. Even if the connections of such private drains were below the water-line in the sewer, the pressure would still be transferred through the water, which will back up in these branch-drains and force back their contents into the houses. The subsidence of the flow when the rain abates leaves voids which the outer air is sure to fill speedily. If direct access is not given, it will find its way through any private drains, emptying all their traps at once, and leaving them to remain empty till filled by drainage from the house they serve, which house in the mean time throughout all its interior becomes a ventilator for the sewer.

In cities which drain into tide-water, the outfalls of the sewers are generally covered at high-water, either every day or at spring tides. If the ends are not provided with gates, the tides enter and fill the sewer as far back as its level allows. If gates exist, they shut with the flow of the tides, and the sewage accumulates within, with a result almost exactly similar to that which would take place with no gates. In either case a large volume of air is displaced by the accumulating water or sewage with every flood-tide, only to be drawn back again when the sewer is emptied on the ebb-tide. If the interior does not communicate freely with the outer air, a pressure of several feet of water must necessarily result, alternating with a corresponding partial vacuum every twelve hours.

Large variations of pressure within the sewers may often occur from the variable quantity of *sewage* as well as of rain-water. Nearly all the sewage from houses is discharged during the hours of daylight; hence there must be a periodic increase and decrease of the amount of air-space within the sewers, depending on the quantity of sewage flowing. This is particularly noticeable with manufacturing establishments, where much water is used during working hours. Of course the air must leave the sewer to make room for the sewage in the morning, and as the flow of sewage diminishes towards evening, the outer air crowds in to fill its place by whatever openings or ducts are found most available.

(*c*) Wind-pressure is the last of the causes named as acting to disturb the equilibrium. This generally acts by blowing in at the outfall. The pressure created there is transferred almost instantaneously throughout the whole system of branch sewers which connect with the main trunk. The amount of pressure exerted by the wind is of course dependent on its velocity. A storm wind with a velocity of fifty miles an hour may not be of frequent occurrence, but a wind with a velocity of forty miles an hour is not uncommon. Such a wind exerts a pressure of eight pounds per square foot, or .055 pounds per square inch. We have nothing to prevent this from entering our houses through the drains except the traps in the latter. The efficiency of these depends entirely upon the depth of their water-seal. Small traps have frequently but a single inch of depth of seal, while a very large number of those which are placed on the waste-pipes of bowls and sinks have less than an inch and a quarter depth of seal. Now every inch of depth of water gives a pressure of only .054 pounds per square inch, which, as just shown, is not enough to resist a high wind, blowing in at the mouth of a sewer, provided its upper ends have no free communication with the outer air to relieve this pressure. Moreover, during the months when our houses are artificially heated, there is always a pressure existing from the outside inward through all the cracks and openings near the basement levels, which will aid the sewer-air in effecting an entrance, there being at such times a slightly reduced pressure or partial vacuum within the house, by means of the heated air in it having less weight than the outer air.

The above considerations show conclusively that whatever remedy is applied should be applied at very frequent intervals of space; for though the disturbing force of the wind does not act with much force except near the outfall of the sewer, all the other disturbing causes which have been referred to are likely to act at any part of the system, and are often acting at various separate places at the same time, while the intermediate parts of the sewer may be filled with water, that would effectually prevent the air from passing from one point to another. In fact, the passage of air within the sewer can never be relied on for any considerable distances, to relieve local pressure, for not only are the intermediate parts liable to be filled

with water when such communication is most needed, but the resistance offered by friction within the walls of the sewer is very considerable. In short, we must provide local relief to meet and remedy local disturbances, and apply such remedial measures within short distances of one another.

THE CONSTRUCTION OF MUSIC-HALLS.

AT the third session of the Congress of Engineers and Architects, held recently in Italy, one of the questions raised, discussed, and voted upon in the first section, whose duty it was to deal with "Architecture and Civil Construction," was the large inquiry as to the form, the materials, and the decoration proper for a hall for music (*sala armonica*) in general, and for the modern theatre in particular. As to this, the section voted, with an addition in the 7th clause, eleven articles, which were brought forward in an elaborate report by Signors Vivanet and Damiani to the following effect: —

1. That wood is the proper material to choose in order to augment the energy of sound in a room adapted for music; that it is best when of uniform fibre, and especially of fir.

2. That only one kind of wood should be used in the construction of any single room in which the distinct and uniform distribution of sound is desired.

3. That the flooring under any sonorous body should be hollow, placed over a compartment also made of fir, and isolated.

4. That it is most desirable that such a hall should be lined with wood, isolated as much as possible from the general fabric of the building.

5. That the soffit of a theatre, the archivolt of the stage, and the fronts of the boxes, should have their superficies composed of thin planks fitted together like boxes, and that if it is necessary to employ columns they should be of wood, and hollow within.

6. The form of a music-hall should be curvilinear; the elliptic curve is the best. For a theatre, the horse-shoe form, now commonly adopted, should be maintained. It is best when the extremes of the semicircle are prolonged in parabolic lines, so as to present the form of a racket.

7. The stage should be constructed as a separate compartment (the term used throughout is *cassa armonica* — musical box); that it should make part of the scenic recess; and that this should be regarded, in great theatres, as the most important part of the building.

8. That the back of the stage-boxes should be curved and coved with low roofs. It would be better to eliminate these boxes altogether.

9. The soffit of the building should be concave, brought low at the sides, with an ample width around it.

10. The fronts of the boxes should be continuous and low.

11. And finally, in order to increase the musical effect of a theatre, the stage should be as large as possible (by the word *palco-scenico* is intended that separate part of the theatre, which is usually of a rectangular plan, which is occupied by the stage, independently of that part of the latter which may project into the auditorium). It will be seen that these recommendations deserve careful study, and that they show study on the part of the architects who brought them forward. The recommendation of the use of only one kind of wood, and that by preference fir; of the lining of the whole interior of rooms intended for music with wainscot; of the division of the wall-lining and of the floor from the masonry of the structure; of the disuse of metal columns; and of the care to be taken in the disposition and workmanship of the stalls, so as to prevent them from absorbing or echoing an undue portion of the sound produced, — are all worthy of consideration. — *The Architect.*

MR. HYATT'S EXPERIMENTS ON CONCRETE FLOORS.

A CORRESPONDENT of the *Building News* comments as follows on Mr. Hyatt's statement of the circumstances and conditions of his experiments, as published in our issue for May 15: —

"The further details of Mr. Hyatt's experiments clearly indicate that the strength of the short brick beams is due to the iron blades, two inches by one-eighth inch thick, introduced into the lower half of the beam, a result which might have been anticipated with beams only five feet long. If Mr. Hyatt will formulate his results, he will perceive the advantages, which he obtains from beams too short to be of any practical use in floor construction, become less and less as the lengths used for floors is approached. This arises from the difference which exists between the bending moments of iron and brick in cement, and from bending taking place as the cube of the length. Thus in a beam twenty feet long, the angle of rupture of the brick will have been reached long before the iron blades will have bent through such an angle as to give any efficient resistance against the bending of the bricks in cement. In fact, the differences between the bending moments in the twenty-feet beam have become magnified sixty-four times, so that it is no wonder the differences which were of no account in the short beam become of immense importance in beams of greater length. Again, if Mr. Hyatt will formulate his results for a beam fixed at the two ends, he will notice the neutral axis is changed from the lower quarter at the centre of the beam to the upper quarter at the two fixed ends, and as there is no iron in the upper quarter of the beam, the advantage of using iron is lost even for short beams, and thus the formula of fixing the end of a homogeneous beam will not apply. Again, if Mr. Hyatt will formulate his results for a square floor resting upon four walls, he will notice that as the iron blades only run in one parallel direction the formula for a homogeneous plate supported on four walls will not apply, and if the edges of the floor are fixed, the formula will be still further removed from that of a homogeneous square plate fixed at the four edges. As this last method is the one usually adopted in practice, it is only necessary to say that the usual opinion as to the strength of such a plate is as much as five times that of the same plate supported like a beam with the ends free. It is from these considerations that those skilled in fire-proof floor-construction aim in the first place to obtain a homogeneous plate securely fixed into four walls. If, however, iron is to be used, then the iron ought to be made of sufficient strength to resist the stresses independently of any apparent stiffness derived from bedding the iron in cement; otherwise there is the very greatest danger of the iron being sheared at the walls. If Mr. Hyatt's construction were applied to floors twenty feet span, the iron would inevitably be sheared from the walls, unless the bricks in cement were of sufficient strength to resist the stresses quite independently of the iron blades.

I am, etc., A. C. P."

A SHAKESPEARE MONUMENT.

ONE of the pieces of sculpture which will probably attract no little attention at the present exhibition of the Royal Academy, but which for obvious reasons we forbear to criticise here, is a seated figure of Hamlet contemplating the skull of Yorick, which has been modelled by Lord Ronald Gower. Another figure by the same young nobleman has been accepted for the Paris *Salon*, and represents young Prince Hal lifting the crown above his head, and pausing, as it were, for a moment before he dares to place it on his brow. The Prince is very simply clad, and is standing on his left foot, the right drawn slightly back, and the right knee bent. Slim, graceful, and vigorous, with his tightly fitting jerkin and trunk hose, the figure has almost as purely sculpturesque an outline as though it were nude. But though so simple, it is not too severe; and though the figure is poised in complete rest and not without a dignified gravity, there is such spirit in the limbs and such latent audacity in the face that we feel the peace and solemnity is but momentary. Not only has the artist seized the happy moment of arrested action to give the repose necessary to a work of sculpture, but he has suggested the previous moment of thoughtless sport and the future of crown-shadowed care. Whatever future criticism may have to say of this work, there can be no difference of opinion as to the originality and spirit of the conception and the care with which it has been executed. There are signs of fresh vitality in the school of British sculpture, but few more favorable than this statue, which, while telling its story by line and contour alone, is yet thoroughly English and living, appealing in sculpturesque language direct to the knowledge and feelings of Englishmen.

That Lord Ronald Gower is no mere *dilettante*, seeking the applause so easily awarded to one of his rank by dallying with the arts, but a painstaking artist whose heart is in his work, and who is determined to be master of it, will be still more evident when we say that this figure and that of Hamlet are only installments of a greater work in commemoration of the greatest English poet. These are, then, two out of four figures representing famous characters of Shakespeare which are to decorate the base of a large monument to the poet on which Lord Ronald has been engaged for some years. The other characters chosen are Sir John Falstaff and Lady Macbeth, the former of which is finished. On the latter, which will complete the work, he is busily engaged. The monument will be surmounted by a group representing Tragedy and Comedy crowning the bust of Shakespeare. The bust follows in costume and general appearance that in the church of Stratford, but it is somewhat more youthful and spiritual in appearance than the rather stiff and stolid effigy which is so familiar to us. Tragedy is standing erect on the left of the plinth on which the bust of Shakespeare is placed. Young, beautiful, and sad, she holds the wreath in her right hand over the poet's head, the arm being bare to near the shoulder, and extended almost to full length. She is half shrouded in a mantle, which covers her head like a hood, and is gathered round her waist by the left hand. On the other side is Comedy, a figure of exuberant joy, with loose locks and careless dress, scarcely able to perform her part of holding the wreath for the laughter which shakes her sides. She appears as if she had run with gay willingness to her task, and to be half embracing the effigy of her lord and master, her laughing head turned, as it were, to the audience in confident appeal for sympathy in her love for him. The action of this figure is, we think, a little excessive, and not altogether graceful in the lower limbs; but it is a vigorous embodiment, and the composition of the three heads and the arms of the two supporters is bold and successful.

The whole work, when completed, will be too large for any ordinary gallery, and it is to be hoped that arrangements may be made for its exhibition at the Crystal Palace or elsewhere, where it may be fully seen and fairly criticised. — *The Academy.*

COMPETITION FOR THE BOSTON ART-CLUB CLUB-HOUSE.

TO THE EDITOR OF THE AMERICAN ARCHITECT:

Sir, — Will you please inform me through the columns of your journal what decision (if any) has been reached in the competition for the Boston Art-Club House? Is it not time we should hear something about it? "INTERESTED."

[We understand that no decision has yet been reached. — EDS.]

NOTES AND CLIPPINGS.

Obituary. — At Plainfield, N. Y., May 26, of typhoid pneumonia, J. D. Stevens, of the late firm J. D. Stevens & Son, New York, N. Y.

Operatives' Dwellings Competition. — The successful competitors in the recent competition for operatives' dwellings are Mr. F. E. Alden, Boston; Messrs. Allen and Kenway, Boston; and Mr. A. Carpenter, Hartford, Conn.

The Fall of Alamo. — The spot selected for a monument to commemorate the fall of Alamo is in the centre of the Alamo-plaza, in front of the Alamo building, at San Antonio, Texas.

The Life of Railroad Bridges. — It is reported that Professor George L. Vose of Bowdoin College, who is regarded as an authority upon such subjects, says that two hundred railroad bridges have fallen within the past ten years.

The Carrara Marble Quarries. — Of the 94,367 tons exported in 1878 from the quarries of Carrara and Massa, Italy made use of 33,081 of which nearly 3,000 were worked and carved. 61,286 were exported abroad, of which nearly 7,000 were worked and carved. The marble is embarked for foreign export on Italian vessels of small tonnage, 80 tons at most, and carried to Genoa and Livornia. Carrara has 387 quarries, 327 of which employ 36,050 workmen, besides 350 women and children who carry water to the workmen in the mountains. The establishments where the marble is worked and carved, employ about 650 workmen. They contain 85 hydraulic saw-mills, worked by the Carrione. In and about Carrara itself there are 147 studios and an academy of Fine Arts. The wages of the workmen vary from 1 franc 8 centimes for the quarrymen, to 4½ and 6 francs for the sculptors. The Carrara and Massa marbles are of several varieties, namely statuary marble, veined marble, *bardiglio*, and clear white. The first quality of statuary marble costs from 300 to 1,600 francs per cubic metre; the second quality costs from 250 to 550 francs; the veined costs from 160 to 550; *bardiglio* from 190 to 280; the first quality of clear white from 250 to 280, and the second quality, 180.

A Non-Sequitur. — "Dr. S.— A.— the veteran medicine man, intends to further improve the street in his vicinity by the addition of another dwelling-house. The doctor has added very much to this part of our village by the erection and remodelling of houses, and also the building of the corporation laboratory, with its imposing towers and artistic design. All of these improvements have been designed and constructed under the personal instruction of the Doctor, which, considering he began his pilgrimage in the last century, is evidence that he has reached the acme of his profession."—*Rhode Island Paper.*

Sand and Lime Plastering. — A correspondent of the *Northwestern Lumberman*, says that a friend some eighteen years ago, in building a residence, insisted upon the plastering mortar for the walls being mixed in proportion of one of lime to eight of sand. The plasterer warmly demurred, but at last consented. His objection was that it would be hard to work, and he could not spread so much in a day. The building was of two stories, sixteen by thirty feet, with an L eighteen by twenty feet, and set on cedar posts. These latter have allowed considerable settling to the building; yet at the end of eighteen years the plastering is firm and with scarcely a crack in it, and may be struck with a hammer without breaking, while in no place have any indications of crumbling become manifest.

The Ruskin Museum. — The London *Times* says: The museum founded by Mr. Ruskin at Sheffield is attracting art-students not only from all parts of England, but from America, and it has become necessary to enlarge it. Crowded with precious stones, rare pictures and valuable books, there is not much space for the students; but Mr. Ruskin has drawn out a plan for the provision of a new wing, or a separate gallery, in which he intends to place a fine collection of prints and casts. The cost of extension is estimated at £500, which amount it is proposed to raise by subscriptions. The museum in course of formation by the St. George's Guild, especially for the use of the artisan students of Sheffield and its neighborhood, is accessible to all. Mr. Ruskin says: "I am, of course, ready to receive subscriptions for St. George's work from outsiders, whether zealous or lukewarm, in such amounts as they think fit. At present I conceive that the proposed enlargements of our museum at Sheffield are an object with which more frank sympathy may be hoped for than with the agricultural business of the guild," and that this is a correct conception is proved by the fact that subscriptions for the extension of the museum are being received from London and other places. "My casts from St. Mark's," Mr. Ruskin writes, "are lying in lavender — or at least in tow — invisible and useless till I can build walls for them; and I think the British public would not regret giving me the means of placing and illuminating these rightly; and, in fine, here I am yet for a few years, I trust, at their service; ready to arrange such a museum for their artisans as they have not yet dreamed of; not dazzling nor overwhelming, but comfortable, useful, and in such sort as smoke-cumbered skies may admit, though not on the outside otherwise decorated than with plain and easily-worked slabs of Derbyshire marble, with which I shall face the walls, making the interior a working-man's Bodleian Library." The casts are from Venice, and have been made under Mr. Ruskin's own superintendence by permission of the Italian Government. They are taken from sculpture that adorns the Ducal Palace and the Cathedral of St. Mark, chiselled between the ninth and the fourteenth centuries, and are very valuable contributions to art. The new gallery will also contain a painting of the west front of St. Mark's, a commission for which has been given by Mr. Ruskin, and the artist will receive £500 for his work. It was originally Mr. Ruskin's intention to extend the museum at his own cost; but subscription-lists are now lying at the local works, and there is little doubt the necessary amount will be obtained without difficulty.

Denis Papin. — Seven cities disputed the honor of having been the birthplace of Homer, and nearly as many countries contest that of having given to the world the inventor of steam, or, more precisely, of steam as applied to the propulsion of engines. Yet if it really was a steamboat that Denis Papin brought down the Weser to Loch in September, 1707, and which was thereupon destroyed by the Mariners' Guild of the Weser on the enlightened ground that they had the exclusive right to navigate that river, it is certain that neither Watt nor Fulton could claim priority in a discovery which was thus made known before either of them was born. There was long a question as to where Denis Papin himself was born. But in 1834 the record of his birth was discovered among the archives of the ancient city of Blois. It has therefore since been conceded that this eminent physicist, like the theologian of the like surname, was born at Blois, and that this occurred the 22d of August, 1647. if any doubt exists as to his invention of the steam-engine, there is no doubt that Papin rendered distinguished services to science. His researches paved the way for improvements that have been of signal value to the race. The destruction of his vessel was a crushing blow to him. He had not the means to build another. As the mayor of Blois said, he had always had little; he now had nothing. But records of what he did, both before 1707 and during the next ten years, at the end of which he died, remain and show the validity of Papin's claim to be held in grateful memory by the fellow-beings whom he lived to benefit. The mayor of Blois has now written to New York, his letter being dated April 27, 1880, to say that a statue is to be erected to Denis Papin in his native town, and asking some moderate contribution from America towards executing the design. "The mite of the United States," writes the mayor, "however small it should be, would be a memory which the town of Blois would cherish. It would be a proof of the sentiments of sympathy which unite the two great republics." This appeal addressed to the great capital of the West, whose sea portals are soon to be graced by a colossal statue which a Frenchman has designed, should evoke a prompt and generous recognition, and it will be pleasant to hear that some of our wealthier citizens have hastened to honor themselves by extending it. In this case more, than in ordinary cases, he will give twice who gives quickly. — *New York Evening Post.*

Wood Fuel. — It is interesting, and to many persons it may be profitable, to know the comparative value of different kinds of wood for fuel. Shellbark hickory is regarded as the highest standard of our forest trees, and, calling that 100, other trees will compare with it for real value as fuel for house purposes as follows; Shellbark hickory, 100; pignut hickory, 92; white oak, 84; white ash, 77; dogwood, 75; scrub oak, 73; white hazel, 72; apple-tree, 70; red oak, 67; white beech, 65; black birch, 62; yellow oak, 60; hard maple, 59; white elm, 58; red cedar, 56; wild cherry, 55; yellow pine, 54; chestnut, 52; yellow poplar, 54; butternut and white birch, 43; white pine, 30. It is worth bearing in mind that in wood of the same species there is a great difference, according to the soil in which they grow. A tree that grows on a wet, low, rich ground will be less solid and less durable for fuel, and therefore of less value, than a tree of the same kind that grows on a dry and poor soil. To the ordinary purchaser, oak is oak and pine is pine; but for house use the tree grown on dry upland and standing apart from all others is worth a great deal more. — *Exchange.*

Soot. — London chimney-sweeps say that the value of a bushel of soot and the cost of the quartern loaf always tally. Owing to the amount of sulphate of ammonia it contains, soot used to be exported in considerable quantities to the West Indian sugar plantations, and it is still a valued manure at home. Sheep and cattle feed greedily on pasture that soot has fertilized, and it imparts a markedly bright green to grass and grain. From it, moreover, bistre is manufactured, and coloring matter for paper-hangings. Like pyroligneous acid, it has been used for the curing of meat, and with a similar effect — the imparting to the preserved provision a taste as if it had been smoked. The best soot is said to be that swept from kitchen chimneys, well impregnated with hospitable fumes. — *Boston Advertiser.*

The British Copyist in Italy. — The new arrangements at the Uffizi Museum and Galleries have now been made, and all the appointments filled up. By the new regulations, permission to copy will be given only to applicants who can give proofs of capacity and training. They must produce certificates from such public bodies as our Royal Academy or Science and Art Department, and it is hoped that these certificates will be given with due care to competent persons only. They must be presented through a consul. "These regulations," our correspondent at Florence writes, "if not especially directed against British applicants, will certainly affect them more than any others. Generally speaking, the English are the only people who venture to apply for permission to copy in public galleries abroad without a knowledge of, at least, the rudiments of art. They, however, make no scruple of occupying places and taking up the keeper's time while they make daubs which help to render English art and taste a matter of ridicule to foreigners. A copyist of six years' standing in our National Gallery was sharply dismissed a short time ago from the Uffizi for incapacity. There is, indeed, no test required by the National Gallery with regard to capacity or efficient training on the part of copyists, and, this being the case, the Florentine authorities refuse to admit any certificate coming from that quarter." This is not a pleasant reputation to have as a nation, but it is to be feared it is deserved, for, while in general English applicants are the most incompetent, they are, at the same time, the most confident. It is to be hoped that these new regulations will open their eyes a little to their own shortcomings, and teach them the desirability of knowing the elements of art before they sit down to copy the works of the great masters. — *The Academy.*

Brumidi's Successor. — It is reported that Signor Filippo Costaggini of New York has been appointed to carry out the unfinished work of Brumidi in the Rotunda. He was a personal friend of the late Signor Brumidi, who before he died expressed the wish that the completion of his work might be entrusted to his countryman.

BUILDING INTELLIGENCE.

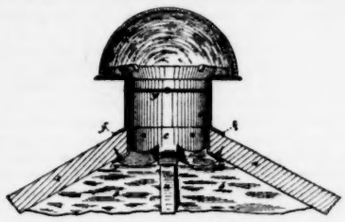
[Reported for The American Architect and Building News].

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

BUILDING PATENTS.

[Printed specifications of any patents here mentioned, together with full detail illustrations, may be obtained of the Commissioner of Patents, at Washington, for twenty-five cents.]

226,625. SKYLIGHT HATCH. — Semon J. Pardessus, Brooklyn, N. Y. *a a* is the sash-frame of the hatch, made of wood or iron, and rabbeted to receive the glass panes *b b* in the usual manner. *c* is an annular metallic ring, provided with a base-flange, *d*, arranged to correspond with the inclination of the sash-frame



and glass panes, and to project a sufficient distance to form a firm support, this flange being made with depending recesses, as shown, to receive the sash-frame, *a a*. *e* is an annular ring, of corresponding diameter with the ring *c*, and provided with an inclined depending base-flange, *f*, similar to the flange *d*. This annular ring *e* rests upon the top of the ring *c*, leaving a space between the base-flange, *f*, and corresponding flange, *d*, of the ring *c*, to receive the sash-frame and the glass panes. The annular ring *e* should project a sufficient distance above the apex of the hatch to receive a removable cap, as shown, and contain a pivoted gate, *g*, for regulating the size of the opening.

227,875. PORTABLE FOLDING DERRICK. — Edward C. Bennett, Philadelphia, Penn.

227,877. HYDRAULIC AIR COMPRESSING APPARATUS. — James M. Bois, Aurora, N. Y.

227,878. ROCK-DRILLING MACHINE. — Samuel G. Bryer, Saugus, Mass.

227,889. SHADE AND CURTAIN ROLLER. — Jos. R. Finney, Pittsburg, Penn.

227,892. WRENCH. — Lawrence Glynn, Cambridgeport, Mass.

227,893. ELEVATOR. — Charles H. Golding, Bodie, Cal.

227,898. METHOD OF LAYING CONCRETE PAVEMENTS. — Charles Heuse, Washington, D. C.

287,899. CARRIAGE FOR ROCK DRILLS. — Nathan W. Horton, Wilkesbarre, Penn.

227,908. ROCK-DRILLING MACHINE. — Robert Magill, Pittsburg, Penn.

227,920. GEARING FOR ADJUSTABLE AWNINGS. — E. Otto Pohl, Philadelphia, Penn.

227,934. FIRE-PROOF SHUTTER. — Elias H. Walton, Cincinnati, O.

227,937. BLIND-SLAT ADJUSTER. — Jonas F. Wile, New Pittsburg, Ohio.

227,954. FILTER. — Ezra Buss, Springfield, Ohio.

227,978. WINDOW-BUTTON SECURER. — Kate D. Hughes, Washington, D. C.

227,985. METHOD OF PROTECTING IRON COLUMNS FROM FIRE. — John McGlensey, New York, N. Y.

227,992. KNOB ATTACHMENT. — Martin Penfield, New Britain, Conn.

228,000. SOLDERING IRON. — Willard C. Smith and B. Duane Joslin, Kinderhook, Mich.

228,027. BEVEL-SQUARE. David Bissehl, Detroit, Mich.

228,030. WIRE-LATHING. — William Brennan, New York, N. Y.

228,044. EARTH AUGER. — Andrew J. Dine, Xenia, Ind.

228,045. DIVISION-BLOCK AND HOLDER FOR STONE SAWS. — Edward D. Dougherty, Philadelphia, Penn.

228,052. BUILDING-BLOCK. — Charles W. Frost, Philadelphia. Penn.

228,056. STEAM ROCK-DRILL. — Geo. M. Githens, Brooklyn, N. Y.

228,062. PENCIL ATTACHMENT FOR PANTOGRAPHS. — James T. Gregory, Athens, Tenn.

228,084. — SEWER AND CATCH-BASIN. — John F. Lavery, Chicago, Ill.

228,091. SEWER-GRATING. — Albien H. Lowell, Manchester, N. H.

228,107. ELEVATOR. — Chas. R. Otis, Yonkers, N. Y.

228,115. COMBINATION TOOL. — James H. Randell, Acworth, Ga.

SUMMARY OF THE WEEK.

Baltimore.

BUILDING PERMITS. — Twenty-one (21) building permits have been issued since the last report, and the following only are of sufficient importance to be mentioned:

Mary Whalen, three-st'y brick dwell., 33 Raborg St., between Arch and Pine Sts.

N. H. Hall, three-st'y brick and stone warehouse, 48 Thames St., between Broadway and Bond St., 50′ x 80′.

Jacob Kern, three-st'y brick dwell., 229 Wolf St., between Alice Ann and Lancaster Sts.

Ida Watkins, three-st'y brick dwell., on Gilmor St., near Edmonson Ave.

Wm. Justis, addition and improvement to dwell., 171 Baltimore St.

CLUB-HOUSE. — Mr. Charles L. Carson, architect, is preparing drawings for improvements and additions to the Maryland Club-House, which will cost $7,000 or $8,000.

SCHOOL-HOUSE. — Mr. E. F. Baldwin, architect, is preparing drawings for the new Grammar School, to be built cor. Eastern Ave. and Burk Sts., to be 53′ x 107′, two stories high; cost, $15,000.

CHURCHES — Mr. E. F. Baldwin is also preparing drawings for St. Leo Catholic church, to be built on the corner of Exeter and Stile Sts., 53′ x 95′, of brick; cost, $25,000.

The corner-stone of the new Polish church to be built on South Ann St. is to be laid June 13.

HOUSES. — Mr. John McFadden is about to build a four-st'y store and dwell., on the cor. of Lexington and Liberty Sts., to be of brick and stone, and cost $4,000; Mr. Chas. L. Carson is the architect. Mr. Carson is also preparing drawings for additions to and remodelling dwellings for Mr. Wm. H. Cole, cor. Monument and Park Sts., to cost $8,000, and store and dwelling for Mr. Geo. Blome, on Baltimore St., to cost $4,000.

Boston.

BUILDING PERMITS. — *Brick.* — *East First St.*, for City of Boston, 1 Laundry, 67′ x 71′; Weston & Shepard, builders; G. A. Clough, architect.

490 *Commercial St.*, F. N. Robbins, 1 store, 31′ x 48′, 4 stories; J. Kelley, builder.

80 *Hampshire St.*, for Roxbury Carpet Co., 1 factory, 50′ x 72′; Nelson Curtis, builder.

Wood. — *Tremont St.*, Ward 22, for House of Good Shepherd, 1 reformatory institution for girls, 25′ x 55′; J. Burke, builder.

Thatcher Ave., 1 dwell., 24′ x 24′; L. C. Norton, owner and builder.

Neponset Ave., for C. H. & J. W. Beckford, 1 storehouse, 24′ x 24′; L. Hunt, builder.

Webster Garden, for Mrs. Chas. Sumner, 1 pavilion, 30′ x 50′; A. B. Pinkham, builder.

Permits for May, and for five months of this year:

	May.	Five Months.
Brick,	26,	127
Wood,	33,	186
Alterations,	233,	924

HOTELS. — A hotel is now building for Mr. George B. Taylor, (who also orders materials), 25 feet on Columbus Ave., and 92 feet on Berwick Park. The building will be six stories high, and will cost about $30,000. Mr. Fred Pope is architect.

Mr. Pope also made designs for the Hotel corner Cazenove St., and Columbus Ave., which is now being plastered. It is four stories in height. William Cogswell, owner and superintendent.

Brooklyn.

BUILDING PERMITS. — *Waterbury St.*, cor. Ten Eyck St., 1 two-st'y brick factory, 50′ x 120′; cost, $11,000; owner, New York Bagging Co.; architect, A. Montgomery; mason, John McQuaid; carpenters, Jenkins & Gillies.

Ten Eyck St., No. 15, 1 three-st'y frame tenement, 25′ x 53′; cost, $4,000; owners, J. & W. Murphy, 17 Ten Eyck St.; architect, John J. Clyde; builder, George Lehrian and Joseph Frisse.

Meserole St., 1 two-st'y brick dwell., 22′ x 28′; cost, $2,400; owner, J. Bigemnan; architect, F. J. Berlenbach; builder, William Bayer.

Chicago.

BUILDING PERMITS. — Weir & Craig, three-st'y addition and one-st'y shop, Stewart and Archer Aves., cost, $8,000.

A. A. Bronchere, two-st'y brick dwell., 25′ x 72′, 120 Dayton St.; cost, $3,500.

Thomas Mackin, two-st'y brick dwell., 20′ x 40′, 280 Indiana St.; cost, $2,500.

J. Feales, two-st'y brick dwell., 20′ x 52′, Throop and Sixteenth Sts.; cost, $2,600.

A. Potzge, two-st'y brick dwell., 25′ x 62′, Twelfth St. and Ashland Ave.; cost, $4,300.

H. Elfring, two-st'y brick store, 23′ x 56′, No. 391 Chicago Ave.; cost, $3,800.

Josephine Seckert, two-story brick dwell., 22′ x 40′, 26 Depuyster St.; cost, $2,000.

J. Fitzsimmons, two-st'y brick store 24′ x 103′, No. 275 South Clark St.; cost, $1,700.

P. Adler, two-st'y brick dwell., 22′ x 48′, No. 202 West Huron St.; cost, $3,300.

W. Karge, three-st'y brick store, 24′ 6″ x 60′, No. 811 Halsted St.; cost not stated.

H. G. Gurren, 2 two-st'y brick stores, 79′ x 52′, Indiana Ave., near Osborn St.; cost, $7,000.

Union Steamboat Co., two-st'y brick ware-house, 78′ x 76′, Market St., near Randolph; cost, $7,000.

John Borden, alterations of Hamlin's Theatre, 87 Clark St.; cost, $30,000.

SCHOOL-HOUSE. — The Board of Education has authorized its building committee to order plans and specifications for the erection of a fifteen-room schoolhouse on the Walnut St. and Kedzie Ave. site. Also to change the proposed schoolhouse at the corner of Franklin and Huron Sts., from a fifteen to a twelve-room building.

New York.

ALTERATIONS. — *Sixth Ave.*, cor. Fourteenth St., four-st'y brick extension, 104′ x 75′; cost, $36,000; owner, Rhinelander estate; architect, James J. Lyons.

Broadway, cor. Forty-First St., internal alterations and repairs; cost, $2,000; owner, Wm. L. Pomeroy; builders, Van Dolsen & Arnott.

North Washington Sq., No. 17, internal alterations and repairs; cost, $3,086; owners, estate of Geo. P. Rogers; architect, Geo. Martin Huss; mason, H. M. Reynolds.

Forty-Fourth St., an iron water-tank to be built on roof; cost, $3,500; owners, East Side Rendering Association; architect, George Brown; builders, Murphy & McGinty.

West Fourteenth St., No. 103, one-st'y brick extension on rear, 22′ 2″ x 28′, a store front put in; cost $3,000; owner, Marshall O. Roberts; architect, John B. Snook.

Fifth Ave., No. 267, four-st'y brick extension, 29 10½″ x 27′ 4″; cost, $8,000; owner, F. C. Lawrence; architect, G. E. Harney; builder, J. J. Tucker.

Barrow St., No. 70, to be raised one story; cost, $3,000; owner, Edwin O'Neil; architect, Henry Palmer; builder, Ed. Denby.

West Tenth St., No. 31, to be raised one story; also a five-st'y extension, 30′ 6″ x 25′ 4″, and interior alterations; cost, $6,000; owner, L. J. Callanan; architects, Thom & Wilson.

East Fifty-Fourth St., No. 8, to be raised to four stories; cost, $2,800; owner, Geo. W. Montgomery; architects, Sillimann & Farnsworth; builder, Eluard Smith.

BUILDING PERMITS. — *Lexington Ave.*, 12 two-st'y brick dwells.; cost, $2,500 each; owner and builder, Chas. Welde, 371 East One Hundred and Twenty-Third St.; architects, Smith & Howe.

East Sixty-Third St., Nos. 105 *and* 107, 2 three-st'y brick stables, each 25′ x 90′; cost, $10,000 each; owners, O'Reilly Bros., 115 East Forty-Fourth St.

Sixty-Third St., 1 four-st'y brick (brown stone front) dwell., 18′ x 55′; cost, $14,000; owner, Francis Crawford, 956 Third Ave.; architect, Fr. S. Barus.

Seventy-Second St., 3 four-st'y brick (brown stone front) dwells., each 16′ 8″ x 55′; cost, each, $14,000; owner, Thomas Kennedy; architect, Fr. S. Barus.

One Hundred and Thirty-First St., 3 three-st'y brick (brown stone front) dwells, each 16′ 8″ x 50′; cost, each, $10,000; owners and builders, McManus & Doke, on the premises; architect, Thomas S. Godwin.

One Hundred and Twenty-Second St., cor. Second Ave., three-st'y brick dwell., 17′ 6″ x 43′; cost, $10,000; owner and builder, A. B. Birdsall, 108 East Twenty-Third St.; architect, J. H. Valentine.

One Hundred and Twenty-Second St., cor. Second Ave., 1 three-st'y brick dwell., 16′ x 43′; cost, $10,000; owner and builder, A. B. Birdsall; architect, J. H. Valentine.

One Hundred and Twenty-Second St., 6 three-st'y brick (stone front) dwells., each 14′ x 43′; cost, each, $9,000; owner and builder, A. B. Birdsall; architect, J. H. Valentine.

Fifty-Seventh St., 4 four-st'y brick (brown stone front) apartment houses, 22′ x 65′; cost, each, $14,000; owner and builder, John Livingston, 304 East Fifty-Eighth St.; architect, J. H. Valentine.

Eighty-Fifth St., 2 four-st'y brick (brown stone front) apartment houses, each 20′ x 62′; cost, each, $13,000; owner, O. W. Loeffler, 113 East Seventy-Seventh St.; architect, John C. Burne; mason, James A. Frame.

Sixty-Fifth St., 5 four-st'y brick (brown stone front) apartment houses, each 20′ x 60′; cost, $9,000 each; owner, W. H. Browning, 441 East Seventy-Seventh St.; architect, A. B. Ogden.

Greene St., No. 106, 1 five-st'y brick (iron front) store, 25′ x 85′; cost, $26,000; owners, Mrs. D. L. Bennett *et al.*, 49 Lafayette Pl.; architect, Henry Fernbach; masons, Amos Woodruffs & Son; carpenters, McGuire & Sloan.

One Hundred and Sixteenth St., to One Hundred and Seventeenth St, 50 West Sixth Ave., one-st'y frame circus building, circular form, 200′ in diameter, no roof; cost, $10,000; owner, Angel Fernandez, 413 Sixth Ave.

Seventy-Seventh St., a brick and wood hospital, 120′ x 18′; cost, $8,000; the German Hospital, owners; H. Schurzmann, architect; C. W. Clappert, builder.

West Forty-fourth St., No. 348, a brick workshop, 25′ x 40′; cost, $2,500; Peter Kay, builder.

East Forty-fifth St., No. 307, a brick five-st'y tenement, 25′ x 75′; cost, $10,000; Erdt & Weyand, owners; Thom & Wilson, architects.

THE BRICK MARKET. — Bricks have fallen in price to a wonderful extent, and the market is thoroughly demoralized. There is a glut of production and a temporary inactivity in building gives small chance of recovery. There is little show for any marked improvement, unless the low prices bring a great deal of extra work.

HOUSES. — On Seventy-fifth St., corner Lexington Ave., Alderman Farley will build six brown-stone-front houses.

Philadelphia.

DURING the past month the records of the office of the Building Inspector show that 349 permits for the construction of new buildings and alterations and repairs on old structures were issued in the month of May. Of the entire number, 83 permits were granted for alterations and additions, 68 for back-buildings, 3 one-story dwellings, 64 two-story dwellings, 63 three-story dwellings, 3 two-story stores, and 10 three-story stores and dwellings. The miscellaneous permits embraced 14 for stables, 8 factories, 1 chapel, 1 Sunday-School, 4 shops, 3 engine and boiler houses, 2 dye and dry-houses, 1 brewery, 2 pump-houses, 4 dry-kilns, 2 foundries, 1 bleaching-house, 1 varnish-factory, 4 warehouses, 1 ice-house, and 2 store-houses.

ASYLUM. — The designs of Messrs. Wilson Bros., & Co., have been accepted for the proposed Presbyterian Orphan Asylum at West Philadelphia. The building will be of brick and stone.

St. Louis.

BUILDING PERMITS. — Twenty-seven permits have been issued since our last report, seven of which are for frame buildings of slight importance. Of the rest, those worth $2,500 or over are as follows: —

Owners Name.	Use.	Stories.	Rooms.	Cost.
J. A. Conlon,	Dwell.	2	8	$3,500
V. J. Paul,	Dwell.	2	8	4,000

Washington, D. C.

The following is a list of contracts made by Gray & Page, architects, during the past month, for buildings in this city.

House for Beldon Noble, Esq., of New York, N. E. cor. of Eighteenth St. and Massachusetts Ave., 60′ x 70′; cost, $50,000.

House for Judge A. B. Haguer, of this city, on

H St., between Eighteenth and Nineteenth Sts., opposite Park; cost, $15,000.

House for Gen. P. V. Hagner, of Troy, New York, H St., between Eighteenth and Nineteenth Sts.; cost, $10,000.

House for Judge C. P. James, of this city, Massachusetts Ave., between Eighteenth and Nineteenth Sts.; cost, $9,500.

House for W. V. Marmion, of this city, H St., between Fifteenth and Sixteenth Sts.; cost, $14,000.

Boat-house for Columbia Boat Club, situated at foot of High St., Georgetown, D. C.; cost, $4,000.

House for Major Goodfellow, of U. S. Cost Survey, Nineteenth St., between N and P Sts.; cost, $8,500.

Four houses, on Twentieth St., between N and P, for Mrs. P. W. Page; cost, $15,000.

House for M. Bailey, Esq., of this city, situated on Dupont Circle; cost, $20,000.

General Notes.

Atlantic City, N. J. — The Union Transfer Co. will build a frame building from the design of Messrs. Wilson Bros. & Co., of Philadelphia. The contractor is Mr. Jno. S. Steele, of Philadelphia.

Augusta, Ga. — A factory is to be built for the Sibley Cotton Mill Co.

Bellevue, Ky. — Mr. Gieger has broken ground on Fairfield Ave. for a new store.

Bergen Point, N. J. — The corner-stone of the new St. Mary's Roman Catholic church was laid Thursday, May 27. The structure will cost about $85,000.

Cleveland, O. — Messrs. Heard & Smith, architects, are to remodel the Idaka Chapel, on Kennard St., at a cost of some $10,000.

Emmettsburg, Io. — Roman Catholic church, brick and stone; cost, $10,000; B. J. Bartlett, architect, Des Moines, Io.

Store for T. H. Tobin; cost, $4,000; B. J. Bartlett, architect, Des Moines, Io.

Fergus Falls, Minn. — A new passenger depot is to be built on the north side of the river, between Whitford and Mill Sts.

Holyoke, Mass. — Caspar Ranger has completed the plans for the three-story block which Martin Smith will build at the corner of Main and Spring Sts.

C. B. Davis will build a large livery stable behind the Windsor Hotel, some time this summer.

Kansas City, Mo. — The Board of Education has chosen a site between Third and Fourth Sts. and Gillis and Troost Ave. for a new brick school-house, which will cost $10,000.

Lebanon, O. — W. C. McClintock, proprietor of the *Western Star*, will erect a two-story brick building on the old site.

Long Beach, L. I. — Mr. Bruce Price, of New York, the architect of the new hotel, is personally supervising the work, which is now nearly completed. The hotel is 875 feet long. Mr. Price has also designed 18 cottages and 1275 bath houses.

Louisville, Ky. — L. H. Bell is to build a two-and-a-half-story brick dwelling on Second St.; cost, $3,000.

Manchester, N. H. — Bids for building the opera-house were received by the architect, Mr. G. T. Fanning, May 26.

Milwaukee, Wis. — Messrs. Munger & Wheeler, architects, of Chicago, are building a grain-elevator for the Chicago, Milwaukee & St. Paul R. R., which will cost $300,000.

Montreal, Can. — It is proposed to build, in the heart of Montreal, a grand central railroad depot, to be reached from the various lines by an elevated railroad running through the streets.

Norwich, Conn. — The First Baptist Society is to build a $7,000 church at the corner of West Main and Fairmount Sts.

Ottawa, Ill. — Messrs. Thos. and Hugh Colwell are building a new house for Dr. Jos. Stout, of this city; cost, $3,000; F. S. Allen, architect.

Parsons, Kan. — School-house, brick and stone; cost, $10,000; B. J. Bartlett, of Des Moines, Io., architect.

Pictou, N. S. — The corner-stone of the new academy was laid May 27.

Pittsfield, Mass. — J. L. Peck is putting up a four-tenement block on the factory grounds, and the Pontoosuc Company are erecting a number of buildings in the same place.

Providence, R. I. — There is now nearing completion corner Tremont and Westminster Sts., for Messrs. Shepard & Wilson, a store measuring 40′ x 135′. Wm. Urquhart, builder; Mr. Fred Pope, of Boston, is the architect.

John P. Smith is building three tenement-houses, to cost about $3,000 each, on Parade St.; contractor, Stephen Peck.

D. C. Moulton is building a dwelling, corner of Mawney and Greenwich Sts.; mason's work, Henry Mason; carpenter's work, Moulton & Ingraham; architect, Geo. W. Cady.

Edward E. Darling is putting up a dwelling house, corner of Broad and Bourbon Sts.; plans furnished by W. H. Colwell, architect; mason's work, I. L. Horton; carpenter's work, Christopher Little; cost, about $7,000.

Rev. A. J. F. Behrands is having a dwelling built on Wesleyan Ave.; a two-story and gabled roof house, 40′ x 54′; mason, Henry Mason; carpenter, Wm. H. Wood; architect, Harris Angell; cost, $6,500.

Rhinebeck on the Hudson, N. Y. — A school-house is to be built from designs of Messrs. Silliman & Farnsworth, of New York.

Riddlesburg, Pa. — Designs for administration offices for the Nimrod Coal and Iron Company have been drawn by Messrs. Silliman & Farnsworth, of New York.

Roscommon, Mich. — Preparations are making to build a small jail, with three cells, costing $2,000.

Sacramento, Cal. — N. D. Goodell is the architect for residence for Daniel Brown, on L St., between Fourteenth and Fifteenth; cost, $4,000; for William Kleinsorge's two-st'y dwelling house, cor. Fourteenth and L Sts.; cost, $5,500; for Jacob Meister's wo-st'y residence, cor. Seventeenth and I Sts.; cost, $4,800; for C. A. Yoerk's residence, on H St., between Fourteenth and Fifteenth; cost, $5,500; and a stable for cost, E. Jacobs, J St., between Tenth and Eleventh; $3,400.

Sag Harbor, L. I. — Messrs. Silliman & Farnsworth, New York, have drawn plans for a new church.

Springwells, Mich. — Kurth & Co. have commenced a new building, adjoining their store, on the corner of Fort and Campau Sts.

St. Paul, Minn. — De Coster & Clark, whose shop and warehouse were destroyed by fire, May 16, will at once rebuild.

Lindekes, Warner & Schurmeir will build, at the corner of Fourth and Sibley Sts., a six-story store, 100′ x 130′.

Streator, Ill. — The new stores of Bilcher & Hatenhower are fast progressing, being built by the Streator Manufacturing Co.

There is some talk of a new church here this summer, for the Independent Society.

Sutherland Falls, Vt. — A subscription paper is in circulation to build a chapel, and Gov. Proctor heads the list with $500.

Thompsonville, Conn. — A special town meeting, called to take action on building a new town-house in place of the old one recently burned, has voted in favor of rebuilding, and a committee, consisting of John A. Houston, Robert R. Morrison, C. O. King, Henry C. Woodword, Henry Abbe, Charles M. Abbe, and Edward Prickett.

Topeka, Kan. — Congregational church, Florence stone; cost, $15,000; B. J. Bartlett, of Des Moines, Io., architect; E. H. Homer, contractor.

Waynesburg, Pa. — A new jail and sheriff's office for Chester County is to be built, the plans and specifications having been approved by the Town Commissioners.

Westfield, Mass. — The corner-stone of the new Episcopal Church of the Atonement, near the corner of King and Washington Sts., was laid Saturday, May 15.

Winfield, Kan. — Two school-houses, of Cowley Co. stone; cost, $11,000; B. J. Bartlett, of Des Moines, Iowa, architect.

Woonsocket, R. I. — The Trustees of the Woonsocket Hospital Company are looking for a site to build upon. They are well agreed that when they build they will do so upon the cottage system. The accumulated funds amount at present to about $60,000.

The steeple of the Baptist church is to be rebuilt.

Industrial.

Cohoes, N. Y. — F. S. Peters is building a new pulp mill.

Danbury, Conn. — Lacy & Dunn, whose fur factory was burned April 1, have bought a site for a new and larger one.

Lowell, Mass. — The Hamilton Company is beginning the alterations on the building, corner of Jackson and Central Sts.

Manchester, Conn. — The P. C. Cheney Company are to erect a new building west of the present pulp house. It will measure 48′ x 210′.

Monongahela City, Pa. — H. L. Ihmsen, Gregor Fox, John J. O'Leary, and James Beck, of Pittsburgh, will build a window-glass factory, and expect to have it ready the 1st of September.

Portland, Conn. — The U. S. Stamping Company have begun another building in place of the one recently destroyed.

Quincy, Ill. — The Quincy Paper Company is building a new mill.

Rock Mills, Ala. — F. B. Rankle & Co. are to build a new cotton mill.

South Keene, N. H. — A new building, 150′ x 40′ is being erected, to supply the buildings recently destroyed by fire, belonging to the Keene Chair Company.

St. Louis, Mo. — The Excelsior Manufacturing Company intends to build another moulding shop, 72′ x 137′; cost, about $8,000.

H. S. Hopkins & Co. are about to erect extensive buildings near the Laclede Rolling Mills.

Bids and Contracts.

Baltimore, Md. — The directors of the Natatorium have contracted with Messrs. Bartlett, Robbins & Co., of this city, to line the entire pool with boiler-iron, a quarter of an inch in thickness. This is to be done to secure a perfect safety from any possibility of accident by breakage of the walls, like that which occured when the water was first turned on, about three weeks ago. The pool is 40′ x 140′, and a huge tank will be constructed and let down within the walls. The construction of the iron lining will be under the directions of Mr. Robert K. Martin, engineer of the Water Board.

Dalton, Mass. — Z. Crane, Jr., Bro. & Co. are to build a store-house, 24′ x 50′.

Greensboro, Ind. — The contract for building the new jail has been awarded to Messrs. Harris & Thomson, of this city.

Holyoke, Mass. — John P. Taylor, of South Hadley, has the contract for enlargement of John Tilley & Co.'s two stores.

Lynn, Mass. — The Council committee has awarded the contract for dredging the channel and building a sea-wall and extending the sewer at the Public Landing, to A. W. Parker & Co. for $7,209.12.

Marshall, Mich. — Pauly Bros., of St. Louis, Mo., have the contract for the new jail of Calhoun County. The contract price is $24,650.

Middletown, Conn. — The contracts for building the enlargement of the State Asylum for the Insane have been awarded. There were about 50 bids, and the successful bidders are pretty evenly divided between Hartford and Middletown, and but one contract goes out of the State. The Walworth Company, of Boston, will put in the heating apparatus. The largest contract, $52,537 for mason-work, goes to Watson Tyron, of Enfield.

Millville, Mass. — The contract for building the new mill for the Lawrence Felting Co. has been awarded to Mr. Patrick Conelly, of Woonsocket. The mill is to be 125′ x 44′, three stories high, and of wood.

New York, N. Y. — Messrs Johnson & Wilson have the contract for 500 barrels of cement, lately called for by the Deportment of Docks, and a similar contract for cement to be used on the Capitol at Albany.

The contract for the iron-work of the U. S. Barge Office has been awarded to Messrs. J. B. & J. M. Cornell, for $49,473.