THE AMERICAN ARCHITECT AND BUILDING NEWS.

VOL. XIV. Copyright, 1883, JAMES R. OSGOOD & Co., Boston, Mass. NO. 397.

AUGUST 4, 1883.

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

CONTENTS.

THE Philadelphia *Press* is kind enough to notice our comments upon the fact, made evident by the investigation now in progress at Washington, that the building business of the United States is too extensive to be carried on with economy by a central bureau, but interprets them as an opinion that abuses have in consequence crept into the administration of the office of the Government Architect. It is only fair to say that this interpretation is quite erroneous. Every one who is concerned with building will understand that while such an office may be administered with the most scrupulous integrity and economy, it must to a certain extent lack those opportunities for taking advantage of circumstances to save money or time which present themselves so often to the private architect; and with equal ability and good intention, the man who is obliged to carry in his mind the affairs of a hundred million dollars' worth of buildings at once can do each of them less justice than they would receive from separate persons, to whom they were matters of special solicitude. In saying this we only repeat the opinion of the last two Government Architects themselves, as expressed in their published reports; and we know of no persons better qualified to judge of the matter. The *Press* thinks that our suggestion, that public commissions should be awarded in this, as in all other civilized countries, to the architects who prove themselves most worthy of them, "opens up an unpleasant vista of favoritism and incompetence." We must confess that we do not see the connection between the two things. Why the system which gives to France at once a Garnier and a Grand Opéra, a Palais de Justice and Duc, the Halles Centrales and Baltard, to England Street and the Law Courts, Barry and the Palace of Westminster, and to Germany, Wallot and the Parliament House, should lead in this country only to "favoritism and incompetence," we cannot understand. Of course, with such struggles as are supposed to be attractive to architects in portions of the West and South nothing but incompetence will care to meddle; but a fair, open competition for a large Government building, with an expert jury to render the award, and the execution of the work at the proper commission for the first premium, would, we are sure, enlist the efforts of the best men in the profession; and it is not too much to say that the best men in the profession in the United States are capable, if not of surpassing their European rivals, at least of doing work which will honor their country as well as themselves.

AT the last Convention of the American Institute of Architects a committee was appointed "to consider the matter of enlarging the number of Fellows of the Institute to a greater number than seventy, and to prepare amendments to the By-laws, to be submitted to the next convention for consideration." The committee has done its duty faithfully, and has prepared a draft of several important amendments to the present By-laws, which has been printed, and is to be considered by the Institute at the convention in Providence this month. Without intruding our opinion upon points which the Institute itself has not yet had the opportunity of discussing, we may without indiscretion mention the important features of the proposed amendments, as having a considerable interest for all architects. The most important change proposed by the committee is one which abolishes all restriction upon the number of Fellows of the Institute, restoring the regulations for admission to that grade substantially to the old form. The form of admission of Associates, however, the committee proposes to assimilate to that for Fellows, requiring candidates for the lower grade to be nominated by two Fellows, and elected by the Board of Trustees, the only difference, apparently, in the process being that the character of candidates for Fellowship is to be officially investigated, and that a three-fifths vote of the Trustees is requisite for an election; while Associates are allowed to enter without either of these restrictions. The old rule, by which all full members of Chapters are, *ipso facto*, Associates of the Institute, the committee proposes to abolish, completing in this way that divorce of the Institute from the Chapters which was begun three years ago.

THE committee suggests that the formation of Chapters of the Institute should be facilitated by permitting associations of architects containing only one Fellow of the Institute to apply for official recognition, instead of requiring three Fellows as the nucleus of the new Chapter, which is the present rule, and explains that the main object of the amendments which it proposes is to assist the Institute "to increase the number of its Fellows so that it shall embrace a large majority of the able and honorable members of the profession who have been long enough in practice to have made a record for themselves;" adding further, that in providing for the continuance of the present rules, which require that members of the Institute shall be notified of the candidacy of applicants for Fellowship, and impose upon them the duty of interposing objections to the admission of men whom they know to be incompetent or unworthy, everthing possible seems to be done to guard the interests of the profession, "as there is no way, as in medicine and law, by which to give a legal professional standing to architects, to distinguish them from quacks and charlatans." The committee probably means that there is, in its opinion, no practical way of accomplishing here the object which it mentions, but, as a mere matter of fact, there is now in force in England a system which, by requiring all candidates for admission to the grade of Associate of the Royal Institute of British Architects to pass a thorough examination, confers upon those who attain that rank a professional standing quite as well defined as that of graduates in medicine, and much more so than that of lawyers, either in England or in this country.

THE subject of diminishing the risk from fire in the business portion of New York seems to have seriously engaged the attention of insurance companies, and a committee, appointed some time ago by the underwriters to confer with merchants, has just offered a series of recommendations of great interest. The most important matter brought up was that of an additional supply of water for extinguishing fires, and the committee advised the adoption of an official endorsement of a scheme which has been somewhat discussed, for bringing water from the Ramapo River in New Jersey in pipes across the Hudson to supply the lower part of the city. In regard to the construction of buildings it was recommended that rates of premium should be increased on all goods stored in buildings more than sixty-five feet in height, unless absolutely fire-proof; that a reduction of five cents in rates should be made for buildings fitted throughout with automatic fire-alarms; that a reduction should be made for buildings having perforated sprinkler-pipes in the sub-cellars and basements; that elevator-wells should be required to be enclosed by brick walls, and that an addition of ten cents to premium rates should be made on buildings situated in streets less than forty feet wide. To this latter suggestion the committee added another recommendation, that

buildings situated in streets less than forty feet wide should be provided with iron shutters to all the front windows. At present the law of New York requires that all openings whatever above the first story in stores and storehouses shall have iron shutters, which must always be closed at night; but the practice has always been to exempt the front windows above the first story, and it would be no easy matter to fit the large windows on the street front of a modern store with shutters. In fact, there is serious reason to doubt the policy of doing so, even if there were no trouble about it. The statute requires that all shutters on street fronts shall be so constructed that they can be opened and closed from the outside as well as the inside; but even with this precaution, the difficulty of detecting and reaching a conflagration so enclosed would, we think, in the opinion of an experienced engineer, go far to counterbalance the benefit which would result from the protection against heat from fires outside. Nothing seems to have been said about stand-pipes, and we trust that the singular resolution passed some time ago, by which the allowance previously made for this invaluable protection was, owing to the finding of a few pipes out of order, entirely withdrawn, has been rescinded; but the conviction left upon our mind by the proceedings is that the underwriters' committee has still much to learn about fire-resisting construction; and that consultation with a good architect, or still better, the observation of a series of practical tests, such as the Boston architects tried in vain, two years ago, to get the underwriters to coöperate with them in making, would not only materially hasten the process of preparing practicable and efficient rules, but would put the committee in possession of knowledge whose value to the insurance interest would be incalculable.

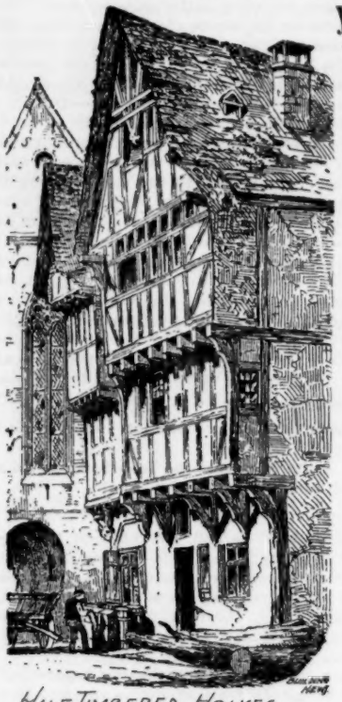
WE have been favored with a copy of one of the most remarkable "invitations to architects" which has yet come under our notice, and take a certain satisfaction in giving it currency. The building to which the attention of the profession is directed is intended for the use of a cotton exchange, and the competitors are required to furnish plans, elevations, sections, diagrams of construction, full and accurate descriptions, and "full detailed bona-fide estimates" of the cost of construction of their designs. The time for submitting drawings is fixed on the first of September next. The circulars have no date, but unless our invitation was unduly belated we are forced to conclude that the competitors generally are expected to go through with the labors specified in about thirty days. This, as we need not tell those who know anything of office business, would involve very lively work on the part of an architect and his assistants, and one would suppose that a committee in such a hurry would expect to pay liberally for compliance with their wishes; so that it is with some surprise that we read a sentence near the end of the circular, announcing that "no premium is offered to competitors," and a careful search through the whole document fails to reveal any promise or suggestion whatever that those who accept this extraordinary invitation will be regarded or treated otherwise than as simple gudgeons, who do not know enough to see whether there is any bait on the hook before biting at it.

AN experienced eye will be caught by another curious circumstance in the wording of the circular. In mentioning the details of the accommodation required in the building, the sizes of the rooms to be provided for are specified with a startling exactness. We read, for instance, that the basement "is to contain a restaurant of about thirty-nine by sixty-five feet, with a room which may be used for kitchen or office; an office which may be either adapted for banking or insurance business, of about twenty-six by sixty-six feet; an office of about twenty-six by thirty-nine feet," and so on; while the story above is parcelled out with similar minuteness. By applying to these peculiar features of the invitation that Socratic questioning which is so dear to the mind no longer subject to the illusions of youth, we may perhaps convey a useful lesson to some of our readers. "How does it happen," we should first ask, "that the desirable height, width and breadth of all the principal rooms in the building have fixed themselves with such exactness in the minds of the committee?" "Evidently," we will suppose Alcibiades to answer, "because the dimensions were measured from some plan." "But if the committee has a plan already made which it thinks well of, why does it send around to architects inviting them to 'compete' in sending more plans?" "Perhaps because it thinks it might be useful to collect the ideas of other people on the subject." "Judging from all the indications, what benefit seems likely to accrue to the innocent persons disposed to exhaust themselves in efforts to furnish these ideas?" We listen in vain for a reply. "What degree of intelligence, then, is to be attributed to those persons, if any, not concerned in the drawings which have obviously been already prepared, who may respond to the committee's invitation?" We leave this question for our readers to answer.

WE have had to say so much of late about the degrading and ludicrous proposals by which certain public functionaries have thought to "invite" the architectural profession to scramble for their little favors, that we are glad to have an opportunity for calling attention to the way in which the laws of civilized countries view the rights of those architects who compete for work in good faith. The authorities of a certain town in France, desiring to build a school-house, advertised, as is customary there, for competitive designs, promising, as is also customary abroad, that the execution of the work, at the usual commission, should be confided to the author of the design placed first by the judges. The highest award fell to an architect of some distinction, M. Bunot, who proceeded, in accordance with the stipulations of the programme, to prepare the working drawings. At this juncture another official, the director of primary instruction, made his appearance, and suggested changes in the plans, which seemed to the architect injudicious, and he objected, naturally expecting that some consideration would be given to his opinion, and that if overruled, it would be by the proper authority. The whole proceeding seems, however, to have been concocted, or at least seized upon as a pretext, by the sagacious village authorities, for getting M. Bunot out of the way, and he was promptly notified of his dismissal, on account of his "refusal to modify the original plan;" and a local surveyor was appointed in his place. M. Bunot, being of an independent character, declined to submit to such treatment, and brought a suit against the town, which was decided entirely in his favor. The court held that the objection of the architect to a change in the plans not formally ordered by the municipal council could not be interpreted as a refusal to make modifications; and that even if he had made such a refusal, the town could not for that reason break its contract with him except through a judicial hearing and decision; declaring further that the unjustifiable dismissal of an architect selected in competition entitled him to recover, as indemnity for the advantages of which he had been wrongfully deprived, the whole commission which he would have had a right to claim if he had directed the construction to its entire completion; and ordering that M. Bunot should be awarded the usual percentage on the total cost of the works to be carried out, deducting only the actual expenses which he would have incurred in superintending them.

ANOTHER illustration of the mode of conducting competitions among people who respect themselves is to be found in the account of two which have just been decided in Paris. As our readers will remember, the City of Paris voted some time ago to set up a statue of Etienne Marcel near the new Hôtel de Ville; and another, of the great republican lawyer, Ledru-Rollin, in some other public place. To secure a choice among sculptors for these important works, competitions were announced, the highest premium in each case being the execution of the statue at the usual remuneration, while prizes in money were offered to the second and third in merit. This, we need not say, is the universal rule of competitions in Europe, where such trials are looked upon as devices for obtaining, at an increased expense, the advantage of several designs for any proposed work, instead of one; and the best artists entered the lists. For the Marcel statue the model of M. Idrac was judged the best, and will be carried into execution. M. Frémiet received one thousand dollars for his model as the second in merit; and M. Marqueste eight hundred for his, as the third. The Ledru-Rollin statue seems to be considered a less important work, as the premiums are smaller, and the names of the competitors are of less note than in the other. For this, M. Steiner receives the highest award, and the execution of the work; M. Eugène Laurent is classed second, and M. Capellaro third, with premiums of two hundred and one hundred and eighty dollars respectively.

BUILDERS' SCAFFOLDING.[1] — XIII.



HALF TIMBERED HOUSES-
BACHARACH PRUSSIA.

THE mechanical principles involved in the laws of the phenomena resulting from the action of physical agencies are the basis of mechanical science. Mechanical forces are distinguished in their nature of production from physical and chemical forces; these latter may produce mechanical effects. It may be premised that unless otherwise indicated, the action of forces will, for the present, for simplicity be confined to a very small body called a particle, and hence the forces will be conceived to act at a single point occupied by the particle, so that the lines of their action will intersect each other in this point. It will be essentially the same if we conceive of force acting on large bodies that it is imparted in directions passing through the centre of gravity, without any tendency to revolve or upset it; but merely to move, press, or pull it.

20. The forces considered in mechanics produce or oppose motion, rest, or change of position of bodies. If the opposing forces are equal, they or the body on which they mutually act are in equilibrium; *i. e.* a balance of opposing forces is established between them.

21. The most potent extraneous forces which we shall have to consider are the nature of *weight*, or gravity, and *momentum*, *i. e.*, weight in a state of motion, or the mechanical effect produced by the weight of a body and the motion imparted to it by force combined.

22. It is convenient in considering the abstract mechanical effect of force on entire bodies, to assume that the body is perfectly hard, impenetrable, rigid; one that does not break, stretch, bend, contract, or otherwise change its shape, and is merely acted upon by the particular extraneous force or forces under consideration and none other; so that the mind need not be perplexed by considering the modifying effect of friction, gravity, — when the active force is other than gravity, — or other extraneous influences, which are reserved to be considered separately under their proper heading. We have only to bear in mind that all that is effected by the extraneous force is to produce motion of the body as a whole; or to strain it with tension, compression, shearing tension, etc.; or to bring it to rest, or keep it at rest, according as the force or dominant remainder of a force which is unexpended in opposing another force assumes or produces any of these states. The body is merely to be considered as the material instrument upon which the force under discussion acts. By observing this process of *isolation*, in reasoning concerning forces, the mind is not at the same instant confused with considering the various physical properties and qualities otherwise inseparable from materials, and which naturally suggest themselves to the observation, but which are more readily considered separately, under "strength of materials," "friction," etc.; and hence, the present study will be much clearer and direct by divesting the word *body* of all these natural attributes which we find materials to possess.

23. Force is *potential* (latent) or *active;* it is a mechanical or physical principle which we can only recognize or measure by some of the physical effects which it produces on matter, considered as entire bodies, at rest, in motion, or strained; or varied combinations of these acting on any body. Force is co-existent with matter; we are not cognizant of force without the interposition of matter, yet matter is not force; it *resides* in a body, latent until called into action by an active extraneous force in physical operation. Force must be resisted by force or a resultant, if more than one force opposes it, in an opposite direction in the same plane of action. Motion produced by a single force acts in a straight line.

24. We shall have to consider the mechanical action of force as applied to rigid bodies derived from weight, gravitative acceleration, momentum, impact, impulse, shock, vibration, or from whatever source they may occur.

25. Amongst the immediate effects produced by force on rigid bodies are the deranging, separating, or compressing of the particles of matter, the fibres, etc., composing the materials of a body, in consequence of which we have to consider the force as acting against the natural inherent forces or resistance, *i. e.*, the *strength of the materials* composing the body.

26. In an analysis of the effects of force, regard must be paid to: (*a*) The quantity or intensity, (*b*) the direction[2] of its action, (*c*) the part of a body to which it is applied, called *the point of application.*

When extraneous force is applied to a body at rest, it imparts[3] force to that body, and if the latent force in or belonging to the latter body is less, motion will be produced; if greater, it will remain at rest, and *strain*[4] will be produced amongst the particles of matter of which the body is composed, in which state it is said to *tend* to produce motion; or if the body were in a state of motion, and mechanical force were applied to arrest or prevent it, and the body still moved, it would produce strain and *tend* to produce rest in the moving body. The element of friction, which is considered as a force, invariably tends to destroy or absolutely prevents motion, but does not produce or tend to produce motion; and hence for distinction is considered separately.

27. A single force can produce motion; but strain requires the presence of at least two opposing forces acting the one against the other, which may be either equal forces or equal portions of unequal forces acting in opposite directions. If a body simply bears or presses upon another, or is suspended from it, it produces simply strain; but in the first instance it is strain pressure, and in the second tension.

28. Force that is expended partly in producing strain and partly in producing motion is called a *working*[5] *force*, as it performs a certain amount of mechanical work.

29. These different mechanical effects produced by force are not different kinds of force, but merely the action and reaction of the same force, acting in opposing directions.

30. When once a force is imparted to a body it would move continually in a straight line in the direction in which it was imparted, and at a uniform velocity, if not restrained or retarded by other force. In practice these retarding forces are gravity, friction of surfaces in contact, etc. Force imparted to a body in a direction passing through its centre of gravity moves or strains it without rotating or upsetting it, or occasioning a tendency thereto; but if it be applied on one side of the centre of gravity, it will tend to rotate or upset it, or absolutely do so, according to its leverage intensity with relation to the resisting force, or elements of stability of the body. Force is assumed to be applied to the rigid body at right angles to its surface at the point of application, in order to impart its full effect. If it be applied obliquely to the surface only a portion of the force is imparted or enters the body, and is in direct proportion to its angle of incidence.

31. If two forces act upon a point in the same line of action their combined effect will be equal to the sum or difference of the effects of the forces acting separately, according as they tend to draw the point in the same or opposite directions.

32. Forces may act in the same or in different planes upon a body: a plane of action may be represented by a flat board in any position, upon which lines are drawn to represent certain directions of forces which would thus be in the same plane; but if two such boards, each having lines to represent the lines of action of certain groups of forces, all in the direction of the same point, be inclined together at right angles, or obliquely or diagonally to each other, the forces represented by the lines on each lie in the respective planes thus relatively represented. Forces in different planes may tend towards each other, and yet never meet or intersect, notwithstanding that the planes in which they respectively act are inclined towards each other; while they would intersect if conceived to be extensible. Forces in different planes may converge towards, or diverge away from, the same point, but cannot be adequately represented together on a flat surface.

33. IMPULSE is sudden impact, blow or collision of a body in motion against another body at rest, or moving in a different direction, or in the same direction at a less velocity. If the force which was in action in moving the body, is in whole or in part suddenly arrested, and converted from motion into *strain*, it is the same

[1] Continued from page 317, No. 393.

[2] *Direction* of a force is the line in which it tends to produce motion. The force may be conceived to act at any point in this line, and the effect is the same whether in producing pressure or motion. A straight line drawn through the point of application of a single force, along its direction, is the *line of action* of that force.

[3] "*Imparted*" must not be confounded with "*applied*," as they are distinct conditions. Force may be *applied* to a body in any direction, but can be *imparted* only perpendicular to the plane of the portion of surface of the body, at the point of application. The scientific *point* may in practice become an area of varied extent, according as the parts of bodies in contact are flat, round, pointed, or of irregular form.

[4] *Strain* is a mechanical change of form, produced by the action of a load or stress equal forces or equal portions of unequal forces acting in opposite directions, either as pushing, pulling, twisting against each other, and may take place either in rest or in motion. *Stress* is strength or molecular force acting within the materials which bring into action their elastic and cohesive properties, by means of the application of external forces, and resists deformation. *Note.*—This distinction is not always observed, the terms being sometimes used indiscriminately. In most materials the *stresses* are sensibly proportional to the *strains* so long as no permanent *set* is produced. If the straining action produce permanent change of form, the *stresses* increase less rapidly than the *strains*, a limit more or less clearly marked in different materials; when *stress* ceases to be proportional to *strain*, the elastic strength of the materials is reached, and should not be exceeded in any structure.

[5] *Work* is measured by *units*, just as length, weight, volume, and time are measured. Thus, to raise one pound one foot high vertically against the force of gravity at the earth's surface is a unit of work. Two pounds raised one foot high, or one pound raised two feet high, equal two units. A unit of work may be with or without reference to a unit of time; 33,000 units of work performed in a unit of time, *i. e.*, 33,000 pounds raised one foot high in a minute, are equal to one *horse-power*. As mechanical resistances and pressures of every kind may be expressed in pounds' weight, the above elementary unit can be used to measure every kind of work.

force producing a different effect, which ultimate effect cannot be measured by a numerically equivalent amount of mere static pressure, dead-weight, or pull, by the ordinary system of units. This problem is at present only capable of assigning what is erroneously deemed by some an equivalent momentum, or impetus, *i. e.*, a quantity of motion acquired by a body, derived from its weight, multiplied into its velocity of motion, and expressed in foot-pounds, foot-tons, etc., per second of time in which the translation of a body is performed according to certain units of weight and space described in units of time. Bodies having equal momentums or moving force will strike equally hard against each other; but just with what mechanical effect expressed in units of dead weight cannot be estimated by any general formula, *i. e.*, the intensity of impact producing equivalent effect to a dead pressure is an incommensurable quantity. Sufficient experiments have been made from time to time to disprove the popular theory of such an equivalence.

34. Momentum or moving force is the quantity of force accumulated in a moving body, and is measured in foot-pounds, or foot-tons, performed per *second* or unit of time. It is derived from the weight of the body in pounds or tons, multiplied into its rate of velocity in feet per second, and hence the momentum force of a small body or weight having a swift[1] velocity may be equal to that of a large body having a correspondingly slow velocity.

35. *Moving* a body and *lifting* it must not be regarded as interchangeable terms for the same effect, though they are sometimes confounded. The least force if unrestrained by other force may *move* the largest body; but the effort of *lifting* is resisted to the full intensity of the action of the weight or gravitative force of the body. Thus a small power only is required to move a body down an inclined plane, if the surface be of a glassy nature, relatively to that required to push it up the incline; or in a still greater degree to that required to *lift* it up bodily.

36. The investigation of strains in trussed or frame structures of all kinds may be considered as based on the following fundamental laws of mechanics, which must be intelligently understood in order to thoroughly comprehend the subject; in fact without knowing them it is impossible to understand intelligently and certainly whether any design or frame possesses the requisite strength, stiffness, or stability to answer its intended purpose.

37. These laws are: (*a*) The composition and resolution of forces; (*b*) The laws of leverage; (*c*) The equality of moments.

38. [As the force of gravity is very nearly constant and always in action, it is a convenient measure of the magnitude or intensity of force; hence, the number of unit-weights which it will counterbalance has been adopted.]

39. *The Composition and Resolution of Forces.* — Force is either single in action, or may be combined in simultaneous action according to certain laws. The direction as well as the magnitude of a force regulates its mechanical effect. The *composition* of forces consists in the method of finding a single force called the *resultant*, whose mechanical effect in quantity and direction is equivalent to two or more single forces of given magnitudes and directions, called its *components*. If the resultant acted in an opposite direction, it would keep in equilibrium the body on which they mutually act through its centre of gravity. The resultant tending towards the same point might be substituted for its component forces with the same effect.

40. A heavy body exerts a vertical downward force equal to its weight, and will descend in a vertical line, if not otherwise influenced by some other force; and its force is always the same as if it were collected in, and acted along that line.

41. But if weight is sustained by two inclined meeting-beams bracing each other rafter-like, as in Figure 34, its effect on these depends on their respective inclinations with relation to the vertical line of gravity; the greater the inclination the greater is the straining effect. The weight thus resolves itself into two forces, one passing through each beam. But it is evident that a vertical *post*, to take the position occupied by the king-bolt, may sustain the weight, in which case the sustaining force is equal to the weight; hence, it is more economical to use a single force than two component forces, for their sum will always be greater than their resultant.

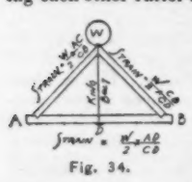


Fig. 34.

42. This form of arrangement in an inverted position, *i. e.*, a horizontal beam, a vertical strut, and two oblique tension-rods constitutes a trussed girder, and is the simplest form of truss. The duty of the different corresponding members in the *inverted* form, and consequently the character of the strains which they resist are reversed; the oblique members being in tension, while the vertical and horizontal pieces are in compression. This arrangement embodies the principle of what is known as the "Fink Truss" (alluded to in February paper, page 56), a simple form of which is shown in Figure 35, the outline of which, *i. e.*, the horizontal beam, the vertical strut in the centre, and the two oblique tension-rods extending from the foot of the stay to the ends of the beam, form the *primary* truss, the two smaller trusses of similar form on each side of the centre are called *secondary* trusses. For the present we shall confine our attention to the *primary* truss. We will suppose a load to be placed on the centre of the beam, its whole weight acting vertically in the direction of gravitation upon the vertical strut in the centre of the beam. As the two abutments sustain the whole load equally between them, it follows that the whole weight is transmitted by the tension-rods — one-half of it by each — from the lower end of the strut to the abutments; hence, the strain on each tension-rod is due to half the central load.[2] We are aware then of the strains produced *directly* at three points, the two abutments and the centre stay being equal to, or expressed by the exact weight of the load, or its direct proportions, *i. e.*, the whole weight on the vertical strut at the centre and half the weight on each abutment; but as the tension-rods do not receive the load *directly*, *i. e.*, in the vertical line of the action of the load as the other parts do, an augmented strain is the result. To find how much the strain is augmented above the direct proportions of the load which the rods receive from the foot of the stay, which must exert the same pressure as the weight upon its head, there is a simple rule: — Call the tension-rod the oblique, and the stay the vertical, to briefly indicate the geometrical relation of these parts for the purpose of expression in formula.

Fig. 35.

The strain on the inclined tension-rod $= \frac{\text{Load in lbs.} \times \text{Length of Oblique}}{\text{Length of Vertical.}}$

[As we proceed we will indicate other methods for obtaining this result.]

Example: — Suppose the length of *vertical* to be 5 feet,[3] and the *oblique* 14 feet, and the load 1,000 lbs. Then

$$\text{Strain on oblique} = \frac{1{,}000 \text{ lbs.} \times 10}{5} = 2{,}000 \text{ lbs.}$$

Thus we find that a load of 1,000 lbs. on the centre of the *primary* truss[4] produces a strain on the tension-rods of 2,000 lbs., just the same as if 2,000 lbs. were actually suspended from each rod placed in a vertical position; hence not only the section of the rods, but their joints and connections, *i. e.*, the eyes, pins, etc., with the other members of the primary truss, must be proportioned to safely sustain this augmented strain.

43. This principle is often useful for strengthening beams and girders for various purposes: as for trussing overhead travelling cranes and to support floors, platforms, walls, etc., and under certain circumstances is adaptable for repairing broken, or strengthening weak beams or ledgers, of long span (when scantlings of sufficient section are not at hand to replace them). Figure 36 shows such a case, but it must be observed that mere nailing or spiking of the tension pieces to the other parts is not to be trusted: bolts should be used.

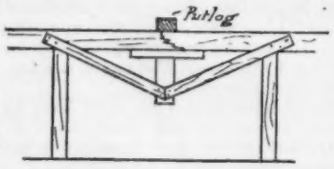
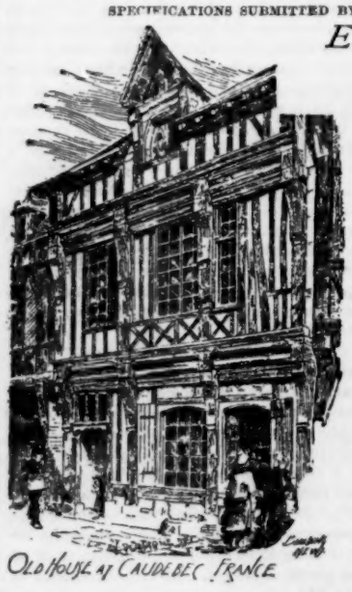


Fig. 36.

THE $3,000-HOUSE COMPETITION. — XVI.

SPECIFICATIONS SUBMITTED BY "*Pencillaria.*"


Old House at Caudebec France

Excavation: — The cellar is to be excavated to a clear depth of 7′ 6″ below the underside of first-floor joist. Trenches for all foundations to be dug at least 6″ below the cellar bottom.

Drains: — All drain-pipe to be of best 6″ Portland cement, to be properly trapped, graded, and the joints cemented tight with Portland cement.

Foundations: — Walls to be not less than 18″ thick; all laid in water-lime mortar, composed of one part lime, and three parts coarse sharp sand, well-filled and flushed upon both sides. The stonework to extend 6″ above grade-line and levelled off for brick and underpinning. The same to be 5′ high all around.

Cut-Stone for cellar window-sills, six in all, to be provided, also one cellar door-sill, to be of a good quality of cut-stone.

Brickwork: — The entire underpinning to be of brick, 3′ high, and 12″ thick, and all brickwork to be of well-burned, hard brick. Cellar piers to be 12″ x 12″. Chimneys as shown, and all flues to be well-plastered

[1] The penetrative effect of bodies of different densities at high velocities, having equal momentums, is not here considered in a practical sense, nor the varying resistance offered by the air to bodies moving in it at different velocities: these must be considered separately.

[2] In this analysis we have, in order to avoid unnecessary complexity, assumed that the beam exercises no transverse resistance to the weight of the load which would assist to carry it, and thereby lessen the full strain on the tension-rods due to the load.

[3] In measuring the length of frame pieces for strains, it must be taken along their centre lines, and only measured between the intersecting points of these centre lines.

[4] *Truss* is a framed girder, or framework structure, employed to transfer its own and any imposed weight to its supports, called its abutments (and pier when it supports the adjacent ends of two contiguous trusses), the longitudinal parts being related by braces and ties, to prevent distortion under the action of external forces, and whose members are subject only to two kinds of strain — tension and compression.

on the inside. Furnace flue, 8″ x 8″, to be carried up straight all the way. The fireplace to have Philadelphia pressed-brick facings, fire-brick lining.

Lath and Plaster: — Pine laths, two-coat plaster.

Cellar Bottom: — Concrete cellar bottom and form gutters around the main walls sufficient to carry all the water to a drain. Place an iron hopper and strainer over the mouth of drain.

Cistern: — The cistern to be 6′ in diameter, and 6′ deep with an 8″-inch hard brick wall laid up with best water-lime mortar, and thoroughly plastered on inside.

CARPENTER-WORK.

Timber and Framing: — First-floor joists, 2″ x 10″, 16″ on centres; second-floor joists, 2″ x 10″, 16″ on centres; attic joists, 2″ x 10″, 16″ on centres; ceiling joists, 2″ x 8″, 16″ on centres; rafters, 2″ x 6″, 20″ on centres; hips, 2″ x 10″; partitions, 2″ x 4″, 16″ on centres; bearing partitions, 3″ x 4″, 12″ on centres; door studs, 2″ x 4″, double; plates, 2″ x 4″, double; bridging 2″ x 2″; girders, 6″ x 10″; sills, 6″ x 10″; girths, 4″ x 4″; posts, 4″ x 6″.

All timber to be of good sound hemlock. All floors to be cross-bridged every 7′.

Hot-Air Pipes: — Furnish double tin hot-air pipes in partitions, where required.

Lumber: — The lumber to be of white-pine unless otherwise specified.

Sheathing: — Sheathe on the outside with sound matched ¾″ hemlock boards, not to exceed 8″ in width.

Exterior Finish: — All exterior finish to be of clear white-pine, well seasoned, and primed as soon as put up. The first story to be covered with feather-edge clapboards, 4″ face, and the second story *shingled* as shown.

Roofs: — Roofs to be covered with good sound hemlock boards, of even thickness.

Shingles: — All roofs to be covered with the best quality of sawed pine shingles, laid 5½″ to the weather.

Floors: — Under floors to be hemlock. Upper floor in first story to be ⅞″ yellow pine or (Norway) pine of best quality stock, tongued and grooved, 3″ in width. The second floor and attic floor to be of a good quality of stock, not over 6″ wide, tongued and grooved, and blind-nailed. The porch floors to be 1¼″ and 3″ in width.

Doors: — All doors to be No. 1 quality mill doors. The sliding doors to be 1¾″ thick; eight panels to each door. Principal doors to be 1½″ thick. Closet doors to be 1¼″ thick, all four-panel.

Door and Window Trimmings: — The sliding doors to be hung on Warner's sheaves, with locks and flush furniture. The front doors to be hung on 4½″ x 4½″ acorn-tipped amber bronze butts, three to each door. All other doors to be hung on 4″ x 4″ cast-iron butts, three to all the largest doors.

Locks: — All principal doors to have mortice-locks. Front door to have a 6″ heavy front door lock, with two keys. Also a bronze knob and fittings. All other doors to have hemacite knobs, roses, etc. Cellar doors to have strong wrought-iron hinges. All window-blinds to be hung on 4″ amber-bronze "Parliament" butts, and trimmed with shutter-bars of same material. All other hardware trimmings to be furnished and put on, for pantries, closets, drawers, etc. Double wardrobe hooks in all closets.

Windows: — Sashes to be 1¼″ thick, of clear white-pine, double hung.

Glass: — All windows to be glazed with best double-thick American window-glass. The cellar windows to have single-thick American glass. The stained-glass in window-heads and staircase window to cost not to exceed 50 c. per foot.

Blinds: — All windows to have inside blinds in two folds, with rolling slats.

Interior Finish: — All inside finish to be with sound, clear, kiln-dried white-pine, unless otherwise specified. Bases in all rooms not wainscoted.

Mantels and shelves: — One mantel in living-room, to cost $10; also three shelves where required, to cost $5 each.

Stairs: — The main staircase to have 1″ risers, and 1¼″ treads with moulding under. Newels and rails to be of best cherry; balusters and all other parts to be of white-pine.

Kitchen Pantry to have counter shelf, and five shelves on each side; two cupboards under counter shelf. Shelves to be closed on one side with panel doors, and to have eight drawers under.

Wainscoting: — Wainscot walls of the kitchen and bath-room 3′ high all around.

Bath-room: — Bath-tub to be cased.

Tinning: — The gutters to be properly lined with best M. F. tin, and run the tin up under the shingles at least 6″, bring the tin over the face of the cornice and tack it down smoothly. All angles, valleys, and other necessary places to be covered with tin as above, all well soldered in rosin and made perfectly water-tight. Leaders to be put up where necessary, of galvanized-iron, 4″ calibre, well and thoroughly secured.

Gas-Pipe: — The gas-pipes to be put in according to the local regulations for all required fixture connections.

Painting: — The exterior to have three good coats. All tin and galvanized-iron work to have two good coats of iron ore and oil. Paint roofs with two good coats of same.

The first floor to be finished with three good coats of best natural wood-finish, rubbed down. This includes the floors. The second story to be painted with three good coats.

PLUMBING.

Boiler: — Furnish and set in kitchen one 30-gallon, heavy pressure, copper boiler, properly connected to range and city water.

Bath-tub: — 12-oz. bath-tub complete, to be supplied with hot and cold city water.

Water-Closet: — Set one Philadelphia hopper-closet in privy properly trapped and connected by a 4″ boiler pipe to sewer. ½″ cold-water supply.

Sink: — 18″ x 30″ cast-iron sink and No. 2 pitcher pump properly connected and trapped. Trap all waste-pipes with Adee patent trap.

TENDERS TO BUILD.

SYRACUSE, N. Y., December 12, 1882.

"*Pencillaria:*"

I will furnish and set in your house one 30-gall. heavy pressure, copper boiler, properly connected to range and city water. Set one 12-oz., bath-tub with plugs and chain, 1½″ waste-pipe and a double bath-cock and sprinkler to be supplied with hot and cold city water. Set one Philadelphia hopper-closet and trap with a 4-inch cast-iron soil-pipe to sewers and ½″ cold-water supply. Set one 18″ x 30″ cast-iron sink, and No. 2 pitcher-spout pump with 1″ suction and 1¼″ discharge pipe, all to be properly trapped. Well trap all waste-pipe with Adee patent trap and do the work workmanlike for ninety-five dollars ($95.00).

EDWARD JOY.

SYRACUSE, N. Y., December 22, 1882.

I will build the cottage designed by "*Pencillaria,*" according to these plans, for $3,169.40.

THOS. JACKSON.

DESIGN FOR COTTAGE SUBMITTED BY "*Pencillaria.*"

ESTIMATE.

Excavation, 200 yds., @ 2° c.		$40.00
Stone-work, 69 perch, @ $2.75.		189.75
(Stone counted as 16½ cubic feet per perch, local custom.)		
Brickwork, 23 M. brick, @ $12		276.00
Plastering, 1,000 yds., @ 20 c.		200.00
Concrete cellar bottom		24.00
Philadelphia brick (fireplace)		12.00
Three terra-cotta panels		30.00
Portland cement drain-pipe		10.00
Total		$781.75

CARPENTER-WORK.

Hemlock, 11,500 ft., @ $22, worked		$253.00
1,000 sq. ft. flooring, @ $24, worked		24.00
1,000 sq. ft. yellow-pine, @ $44, worked		44.00
2,000 sq. ft. white-pine flooring, @ $34, worked		68.00
Windows.		
Outside casing, stock and labor	$ .50	
Inside casing, stock and labor	.80	
Jambs, with stops, etc.	1.00	
Sill, with mouldings	.32	
Sash	.72	
Glass	2.66	
Blinds	3.40	
Fitting sash and blinds	1.00	
Trimmings	.75	
Weights	.80	
Glazing	.90	
Twelve 4″ x 4″ colored lights, @ 5c.	.60	
Total	$13.45	
25 windows, average price $13.45		336.25
6 cellar windows, @ $6 each		36.00
3 gable windows, @ $6 each		18.00
3 sliding doors, @ $25, complete		75.00
Doors.		
Architrave, stock and labor	$ 2.00	
Jamb " "	1.00	
Door	2.65	
Trimmings	.75	
Labor, hanging and trimming	.60	
Incidentals	1.00	
Total	$8.00	
24 doors, average price $8		192.00
Hall stairway		40.00
Kitchen stairs		12.00
Cellar stairs		5.00
Attic stairs		5.00
1,250 ft. siding, @ $40, worked		50.00
11,000 shingles, @ $7		77.00
1,300 shingles for roof, @ $7		91.00
800 ft. of baseboard, @ 5 c.		40.00
25 ft. wainscoting, @ 5 c.		12.50
Front porch		50.00
Side porch		38.00
Rear porch		38.00
Side balconies		72.00
Pantry		15.00
Fitting of rear water-closet		12.00
Cornice and gutter, 172 ft., @ 50 c.		86.00
3 gables, @ $20 each		60.00
Gas-pipes		38.00
Cellar doors		10.00
Cresting		8.00
Flashing, and galvanized-iron conductors		50.00
Mantel-piece		10.00
3 mantel shelves, @ $5		15.00
Water-table belt		35.00
Middle belt		35.00
Painting, complete		200.00
Plumbing		95.00
Architect's percentage		150.90
Total		$3,169.40

BILL OF DOORS AND WINDOWS.

First Story: — 1 front door, 4″ x 8″, eight panels, 1¾″ thick; 2 sliding doors, 3′ 6″ x 8′, six panels, 1¾″ thick; 2 sliding doors, 3′ x 8′, six panels, 1¾″ thick; 1 sliding door, 5′ x 8′, eight-panel, 1¾″ thick; 8 doors, 2′ 10″ x 7′ 4″, four-panel, 1¾″ thick; 2 closet doors, 2′ 8″ x 7′ 4″, four-panel, 1¾″ thick; 1 water-closet door, 2′ 6″ x 7″, four-panel, 1¼″ thick.

Second Floor: — 8 doors, 2′ 8″ x 7′, four-panel, 1¾″ thick; 6 closet doors, 2′ 6″ x 7′, four-panel, 1¼″ thick.

Oriel Windows: — 3 windows with transom head-glass, 24″ x 27″, 2 lights pe casement; 3 transom lights, outside size of glass, 20″ x 24″.

Staircase Windows: — 2 windows with transom-heads, glass 26″ x 30″, two lights per casement, upper sash to be filled with 4″ x 4″ stained-glass transom; two casements, 26″ x 26″ glass, fitted with irregular pattern stained-glass.

First Story: — 9 windows, size of glass, 28″ x 36″, two lights to each casement; 12 4″ x 4″, stained-glass in upper sash.

Second Story: — 9 windows, size of glass 28″ x 32″, two lights to each casement; 12 4″ x 4″ stained-glass in upper sash.

THE ILLUSTRATIONS.

THE "BERKSHIRE," NEW YORK, N. Y. MR. CARL PFEIFFER, ARCHITECT, NEW YORK, N. Y.

THE co-operative apartment-house, which is to be known as the "Berkshire," and will cost $320,000, making the value of the property, including the land, $400,000, is to be built by the "Berkshire Apartment Association," a company organized by Mr. Pfeiffer, and incorporated under the laws of the State. There are eight shareholders in the association, Fletcher Harper, of the Harper Brothers, publishers, Treasurer. It is expected that each of the shareholders will occupy one of the apartments in the "Berkshire" when the building is completed, and this apartment will be his property permanently. The other apartments are to be rented out, and the stockholders will have a joint interest in the profits arising from this source, which will be realized in the form of regular dividends at stated intervals. The "Berkshire" will have a frontage of 76 feet on Madison Avenue, and a depth of 91 feet on Fifty-second Street. It will be nine stories high, with a basement and sub-cellar. The first story will be built of granite, and the upper stories of Croton pressed-brick, with stone, terra-cotta, and moulded brick ornamentations. The height of the building from the sidewalk to the roof

will be 122 feet, and the roof, which is to be flat, will be laid in tile-work, so as to form a promenade. The main entrance for the occupants of apartments will be on Madison Avenue. A separate entrance for servants and tradespeople will be constructed in the court-yard at the rear of the building. Inside the "Berkshire" will be cut up into seventeen apartments, two on each of the first seven floors, and three on the eighth floor. Each one of these apartments will consist of a library, a dining-room, a parlor, a kitchen, a bath-room, a laundry, a servants' room, abundance of closet room, and four bedrooms. The partitions are to be so arranged that they can be moved so as to meet the views of the occupants in regard to the size of any of these rooms, and each apartment is to have a second servants' room and a trunk room on the ninth floor, which is to be used as an attic for the convenience of tenants. On this floor, also, there is to be a steam drying-room. The kitchens of the apartments on the eighth floor will be in the attic. The rooms will all be finished in hard wood, and each apartment is liberally supplied with bay-windows, and balconies of iron and stone, which will serve to ornament the exterior of the building as well as for the convenience of the occupants. The upper sashes of the windows are to be of stained glass, and the lower, of the finest French-plate glass. The floor of the hallways and the landings of the stairs will be laid in tiles, and wherever the interior of the building can be tastefully ornamented it will be. A wide staircase is to lead from the main entrance to the different apartments on the upper floors. The supports of this will be of ornamented iron, the steps will be of white marble, and the railing of colored marble. A separate staircase for the servants and tradesmen will lead from the entrance in the court-yard. There will be two elevators, one for the use of the occupants of the apartments and the other for the servants, and the former will run to the roof of the house to accommodate gentlemen and ladies who wish to utilize the roof as a promenade. It is expected to light the building by gas, but the fixtures will be so constructed that as soon as any electric-light company locates a main near enough to be available electricity can be substituted for the gas. A portion of the basement will be set apart for the use of the janitor, and the two apartments on the first floor will have their kitchen and laundry here. The remainder of the basement is to be rented out for offices to physicians. The cellar is to be used for the engine and boiler rooms, and for the storage of coal. Here will be located an apparatus for cremating the refuse of the kitchen; this refuse being dried by steam, and then burned. The house is to be heated throughout by steam. For ventilation the same system will be used that has proved so successful in Dr. Hall's church, and the Roosevelt Hospital, both of which buildings were designed by Mr. Pfeiffer. It consists simply of a large fan in the basement, which forces the air over steam coils. The "Berkshire" will be made as thoroughly fire-proof as possible, and two iron staircases will run from the roof to the court-yard in the rear, connecting with each floor, for use in case of fire.

COMPETITIVE DESIGN FOR A $3,000-HOUSE SUBMITTED BY "*Pencillaria.*"

"'*Pencillaria's*' design is ingenious and attractive. By careful study he has turned an unpromising scheme into an excellent plan. Room is economized with great skill. An inherent fault lies in having to pass from kitchen to front hall through the dining and living room. The exterior could have been made attractive without the many breaks which now form a serious item of cost, and the outside chimney for the fireplace in the parlor alone is an expensive luxury. This want of self-denial prevents the design from taking rank beside those which have been made attractive by simpler means. The drawing is neat and crisp throughout, but in the detail of the fireplace there is evidently a slip which throws it out of true perspective." — *Extract from Jury's Report.*

HOUSE FOR GEORGE E. BOYDEN, ESQ., PROVIDENCE, R. I. MESSRS. W. R. WALKER & SON, ARCHITECTS, PROVIDENCE, R. I.

THE SIGMA PHI CHAPTER-HOUSE, WILLIAMSTOWN, MASS. MR. JAMES G. CUTLER, ARCHITECT, ROCHESTER, N. Y.

ADOPTED DESIGN OF MONUMENT FOR MONMOUTH BATTLE-FIELD, NEW JERSEY. ARCHITECTS, EMLEN T. LITTELL AND DOUGLAS SMYTH, NEW YORK; SCULPTOR, JAMES E. KELLY, NEW YORK.

The monument stands in a triangular lot and has a total height of ninety feet. The materials used are granite and bronze. In the base are set bronze medallions of prominent officers. The drum shows bas-reliefs in bronze of striking incidents of the battle. Bronze shields, bearing the coats of arms of the States whose colonial troops were present, festooned with laurel, rest on the upper weatherings. The remainder of the work, including the heroic-size statue of Liberty on the summit, is of granite. The appropriation, authorized by the State of New Jersey and the United States Government, is $40,000. The monument will be completed in 1884.

Preserving Iron from Rust. — The process of coating iron surfaces with fine metallic zinc mixed with oil and a drier and applied with a brush is recommended by *Engineering*. Two coats are said to be a secure protection against both the atmosphere and sea-water. A good mixture, of which only the necessary quantity ought to be prepared, consists of eight parts by weight of zinc, seventy-one of oil, and two of a siccative.

THE COMPETITION FOR A MECHANIC'S DOUBLE HOUSE.

FROM A HOUSE AT VIENNA, AUSTRIA

The few designs — only five in all — submitted in the competition for a double tenement cottage for two mechanics, the cost being limited to $3,000, made so little impression on our memories that after they had been sent down to our vaults their very existence was forgotten until one of the competitors reminded us that no announcement of the result of the competition had been made. For this negligence and forgetfulness on our part we desire to offer to the competitors our regretful apologies.

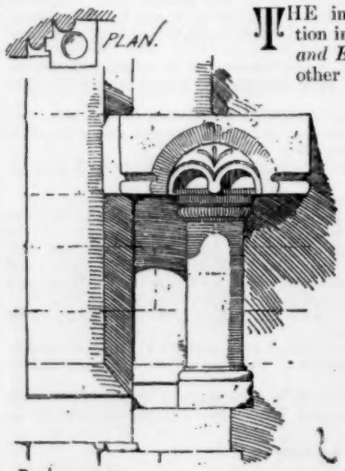
On examining the five designs we find that one of them, "*Family Broils's*," was received too late to be admitted to the competition, while the authors of the designs signed "*Great Expectations*" and "*Workmen*" failed to comply with the requirements of the programme in important particulars.

Thus the competition is restricted to the designs submitted by "*Artalie*" and "*Harrison*," and of these two "*Harrison*" alone has complied with all the conditions and has, moreover, succeeded in giving his design the character that one expects to find in a working-man's dwelling.

In view of these facts it has seemed to us that we should be doing no injustice to those who took part in the competition if we passed over the formality of submitting the drawings to a jury and settled the matter by awarding a second prize to the author of "*Harrison*," Mr. H. H. Atwood, of Boston, Mass.

Of the other designs we will merely add that next to "*Harrison's*" the design most in character is that of "*Workmen*," while the most attractive in design and the most ingenious in plan is that of "*Family Broils*," but we very much question whether a building of the size and architectural pretension of the one shown could be built, even in Denver, Colo., with a brick lower story for the sum named in the estimate.

A FEW WORDS ON FOUNDATIONS.



PISCINA - PRIORY OF ST GABRIEL CALVADOS, FRANCE — XIIIth CENTURY

The importance of a good foundation in building, says the *Building and Engineering Times*, as in most other things, will not, we presume, be disputed. A structure, like an argument in logic that is ill-founded, carries in it the germ of inevitable failure, if not of total annihilation. There is seldom great scope for choice in the selection of sites for building purposes, and a man takes a plot of ground as he takes a wife, for better or for worse. The nature of the subsoil in any district may generally be ascertained by inquiry with tolerable accuracy, but contingencies may often arise which will involve the builder in greater expense than he has reckoned upon. A loose bottom necessitates extra digging, or an influx of water involves a pumping and consequent delay. We have known contractors to be very hardly treated at times by architects in the matter of foundations. The modern iron-hearted practitioner, "conscientiously acting in the interests of his client," sternly declines to allow extras for unforeseen calamities such as the above, which ought, he thinks, to have been taken into account in tendering, while he as strictly insists upon exacting deductions for any unexpected advantages that may accrue to the builder — such, for example, as the fortunate discovery of sand on the site, which can be used for mortar.

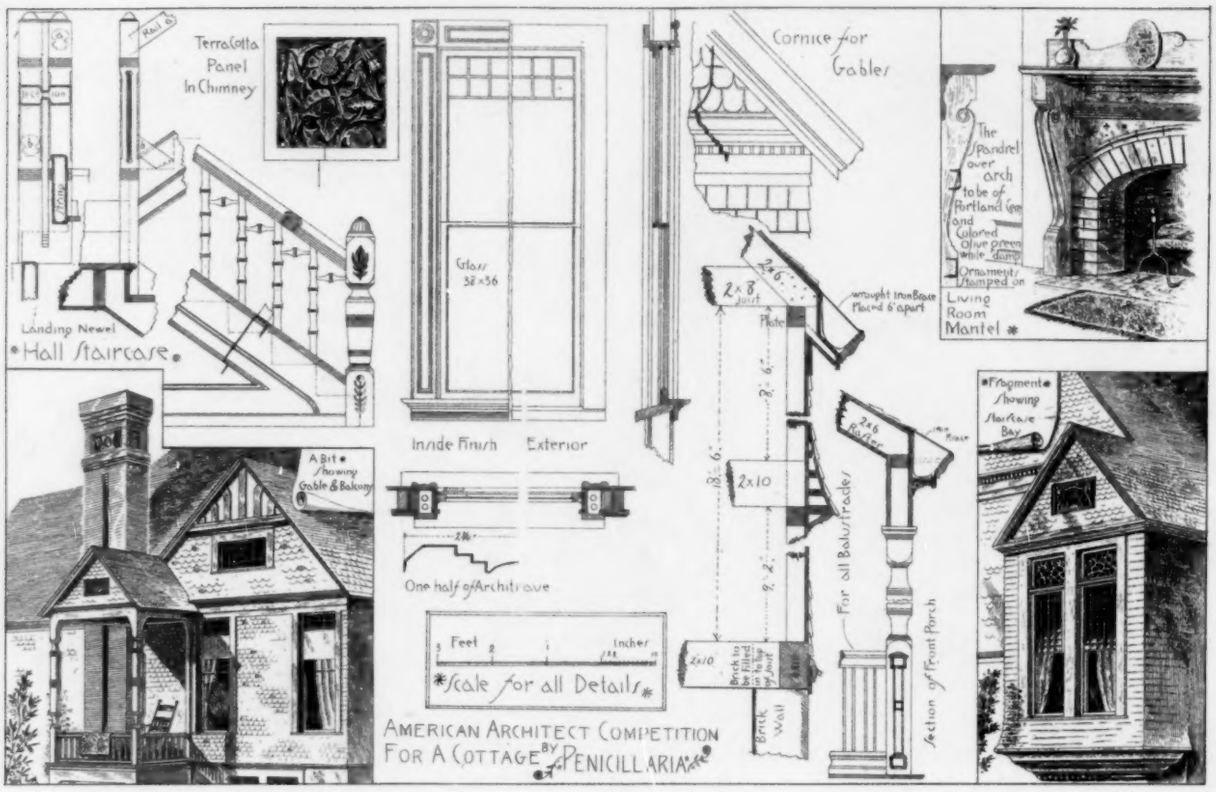
The nature of the subsoil is best ascertained by sinking a well on the site. Clay is so liable to expansion and contraction from the alternate moisture and dryness of the weather, that it is no trustworthy bottom, and dry gravel is not only shifty, but subject to cavities which render it unreliable. In such cases an artificial foundation of concrete should be provided. Too much moisture may kill the lime in the concrete, and in some cases necessitate the use of an hydraulic lime. The mention of concrete leads us to reflect upon a popular superstition, which is very deep-rooted. It is generally assumed that in order

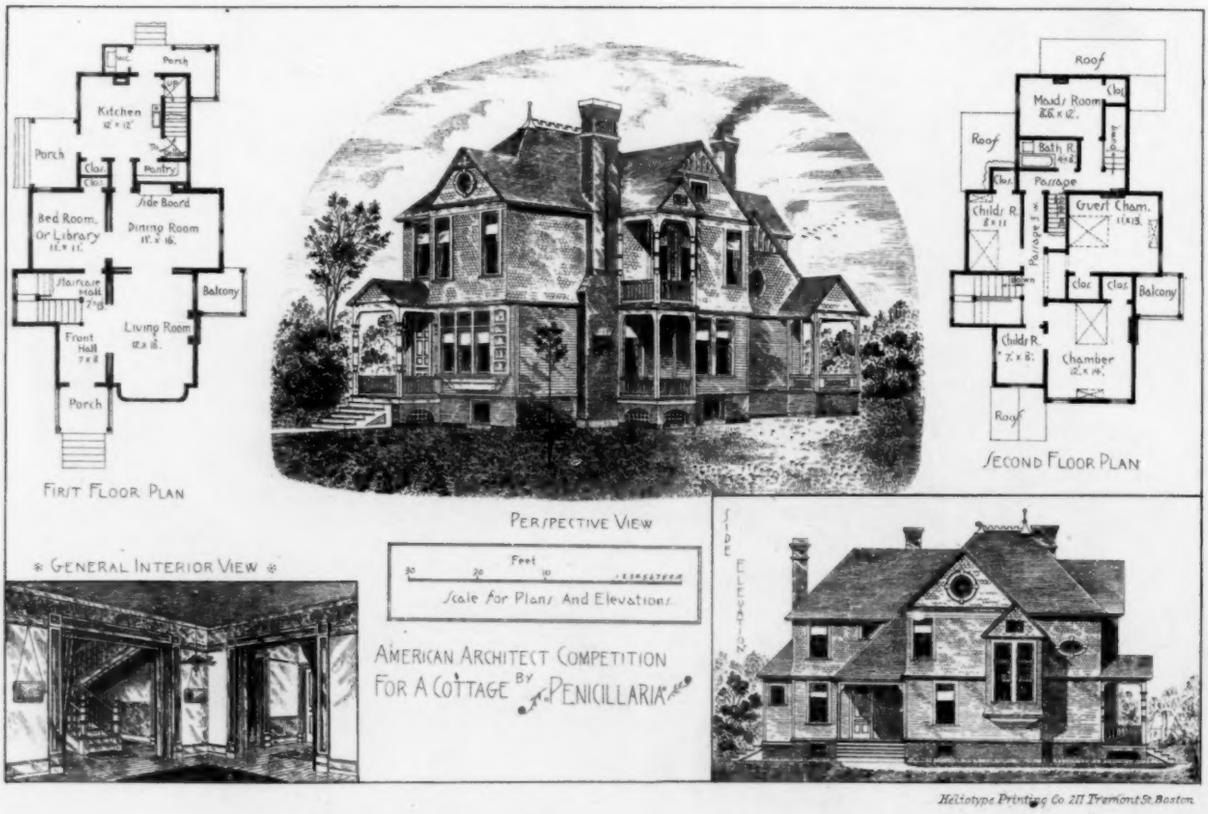
Plan.

Design of Monument for Monmouth Battle Field N. J. Adopted by the State Commission and approved by the Secretary of War.

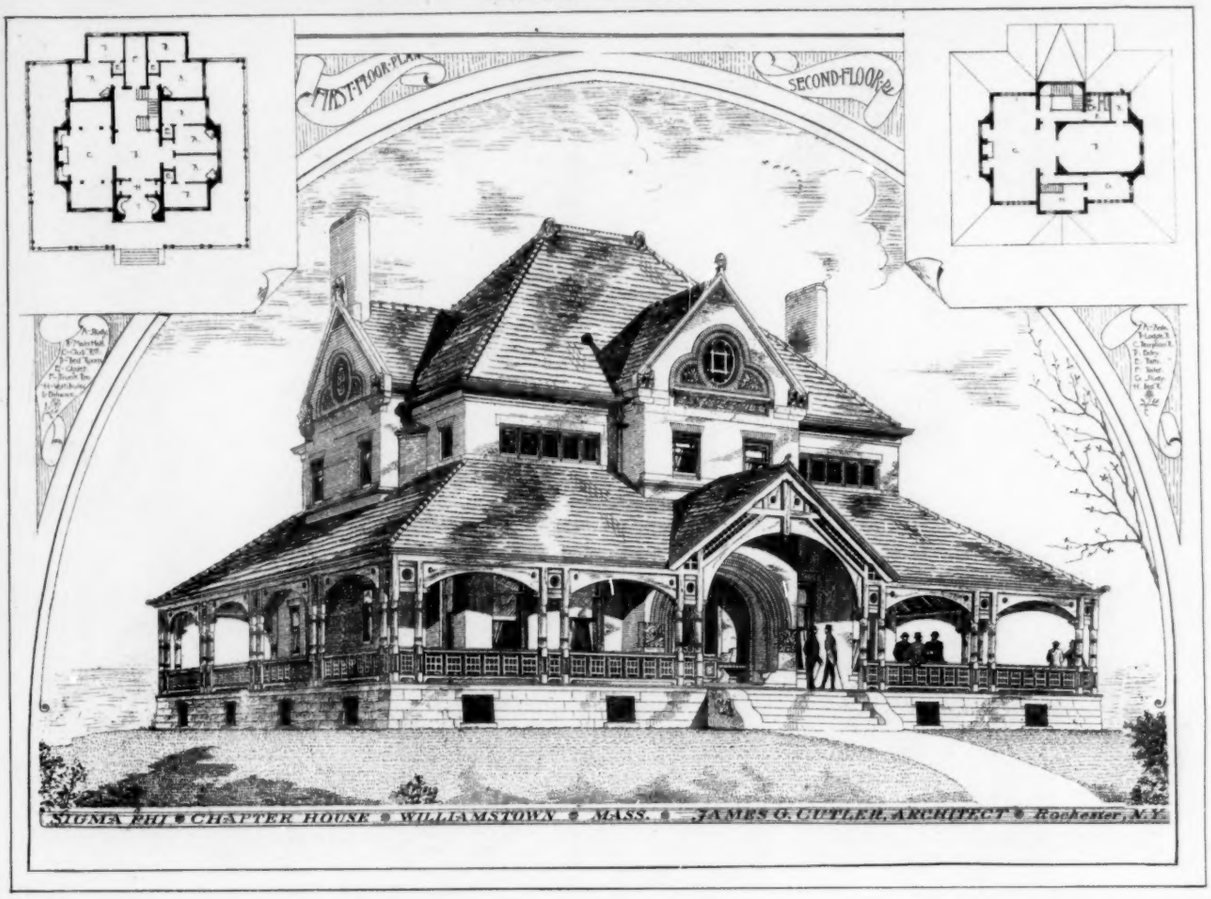
Emlen T. Littell, Architect. Douglas Smyth, Architect.

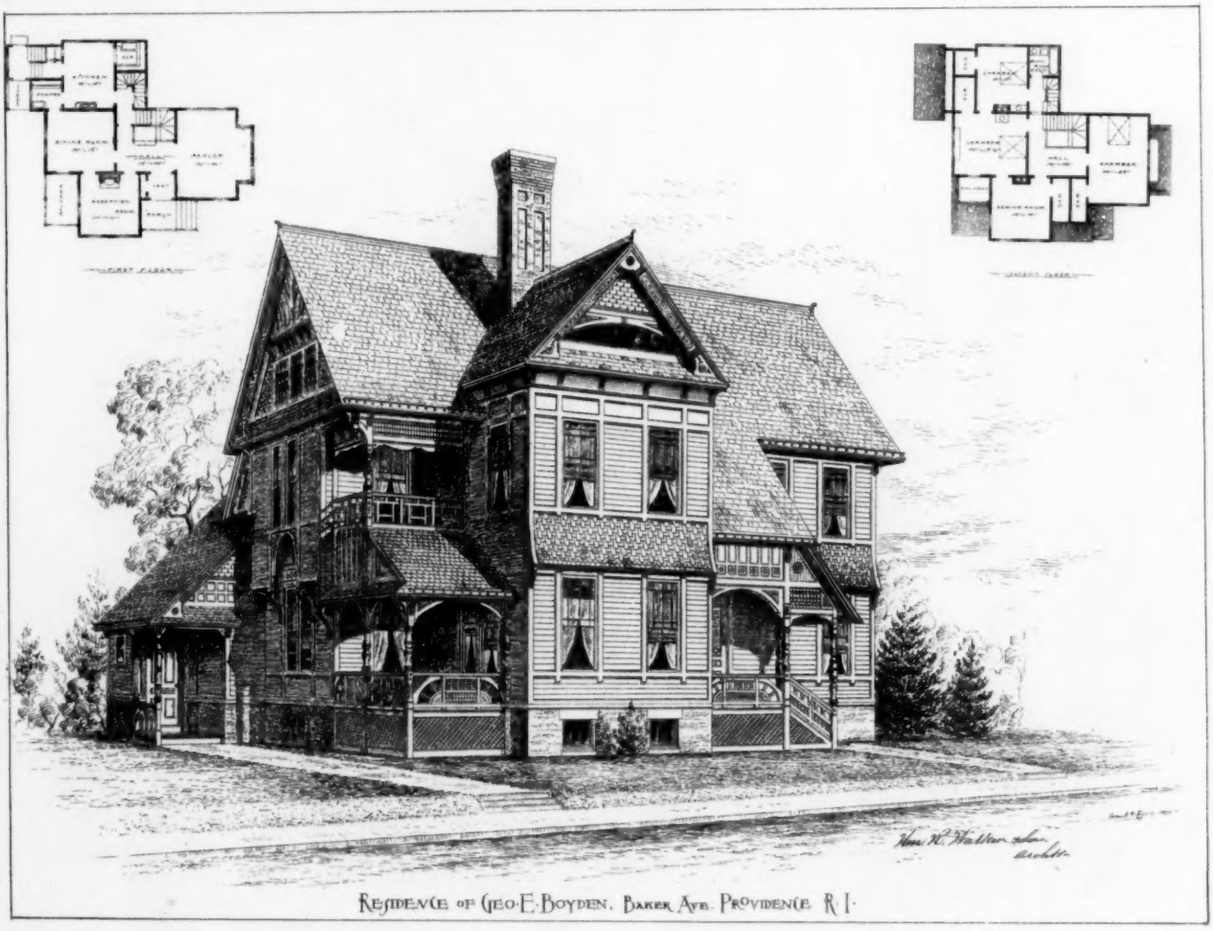
Heliotype Printing Co. 211 Tremont St. Boston.





Heliotype Printing Co. 211 Tremont St. Boston.



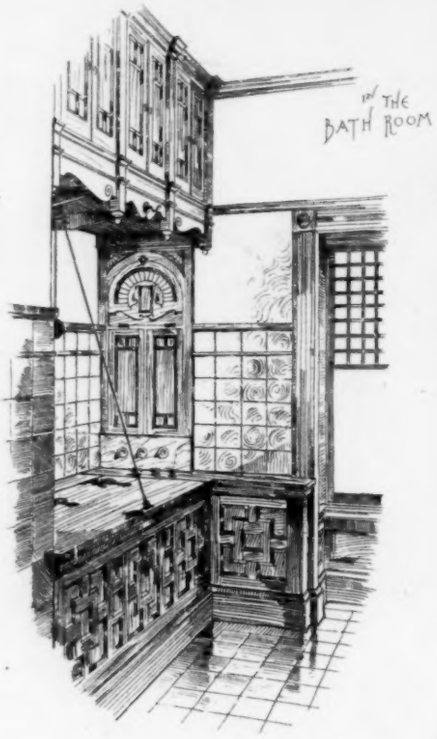


RESIDENCE OF GEO. E. BOYDEN, BAKER AVE. PROVIDENCE R.I.

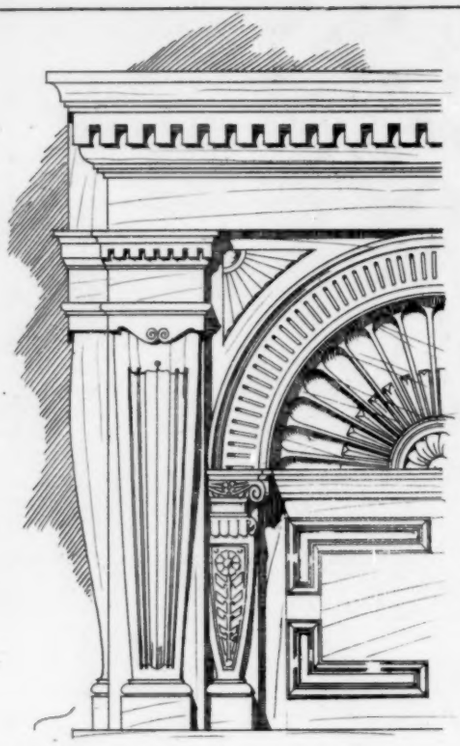
Heliotype Printing Co. 211 Tremont St. Boston.

"THE BERKSHIRE": N.W. COR. MADISON AV. & 52D ST.
NEW YORK CITY.
CARL PFEIFFER, ARCHT.

Heliotype Printing Co. 211 Tremont St. Boston.

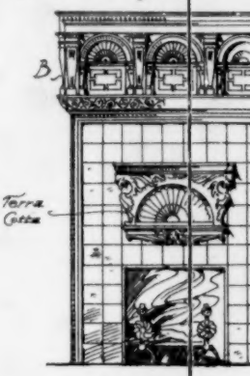


In the Bath Room



Mantel in Parlor. Detail at B.

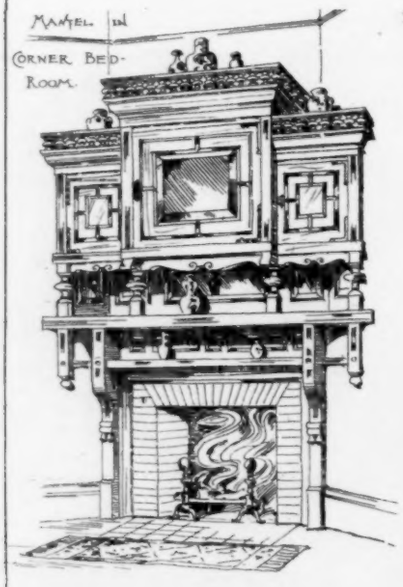
Mantel in Parlor.



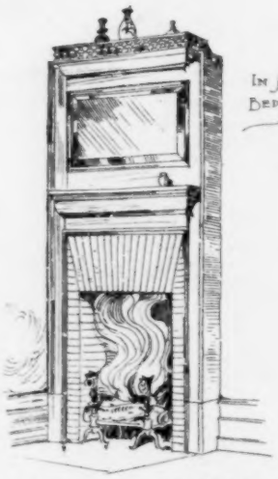
B.

Terra Cotta

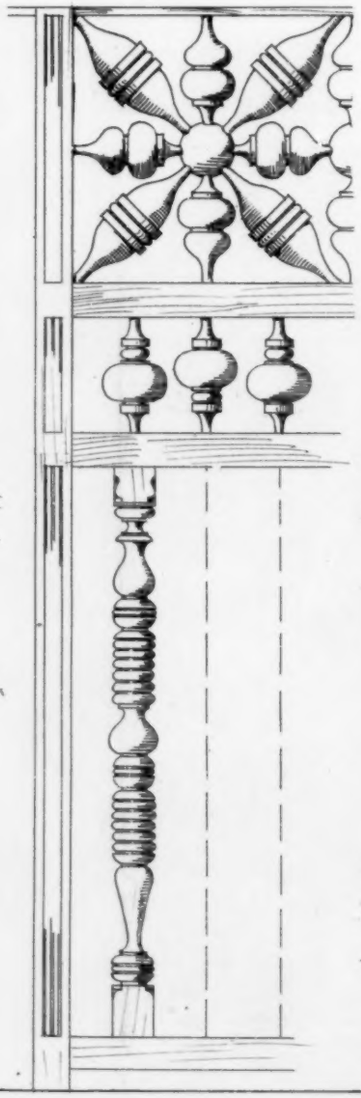
Mantel in Library Detail at A.



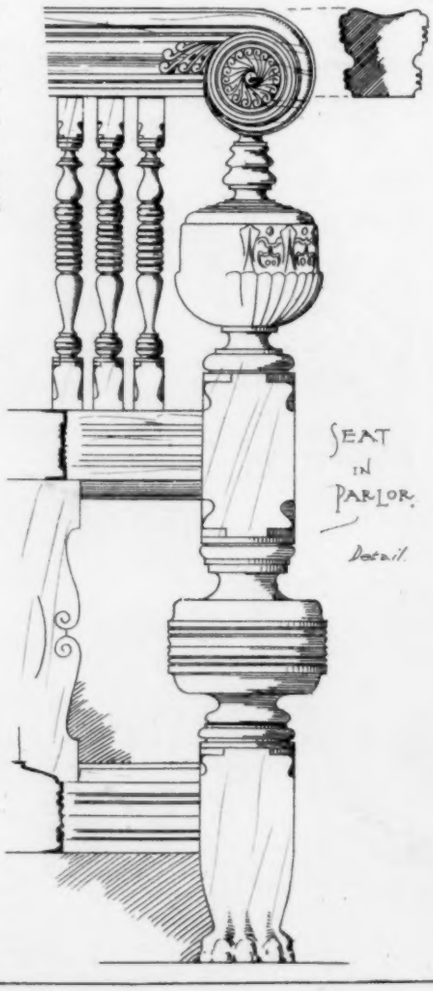
Mantel in Corner Bed-Room.



In Small Bed Room



Detail of Portion of Screen in Parlor.

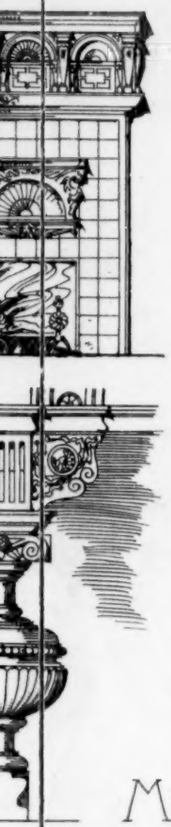


Seat in Parlor. Detail.

Details prepared for Reproduction by J. A. Gregg.

1883 JAMES R. OSGOOD & CO.

PARLOR.



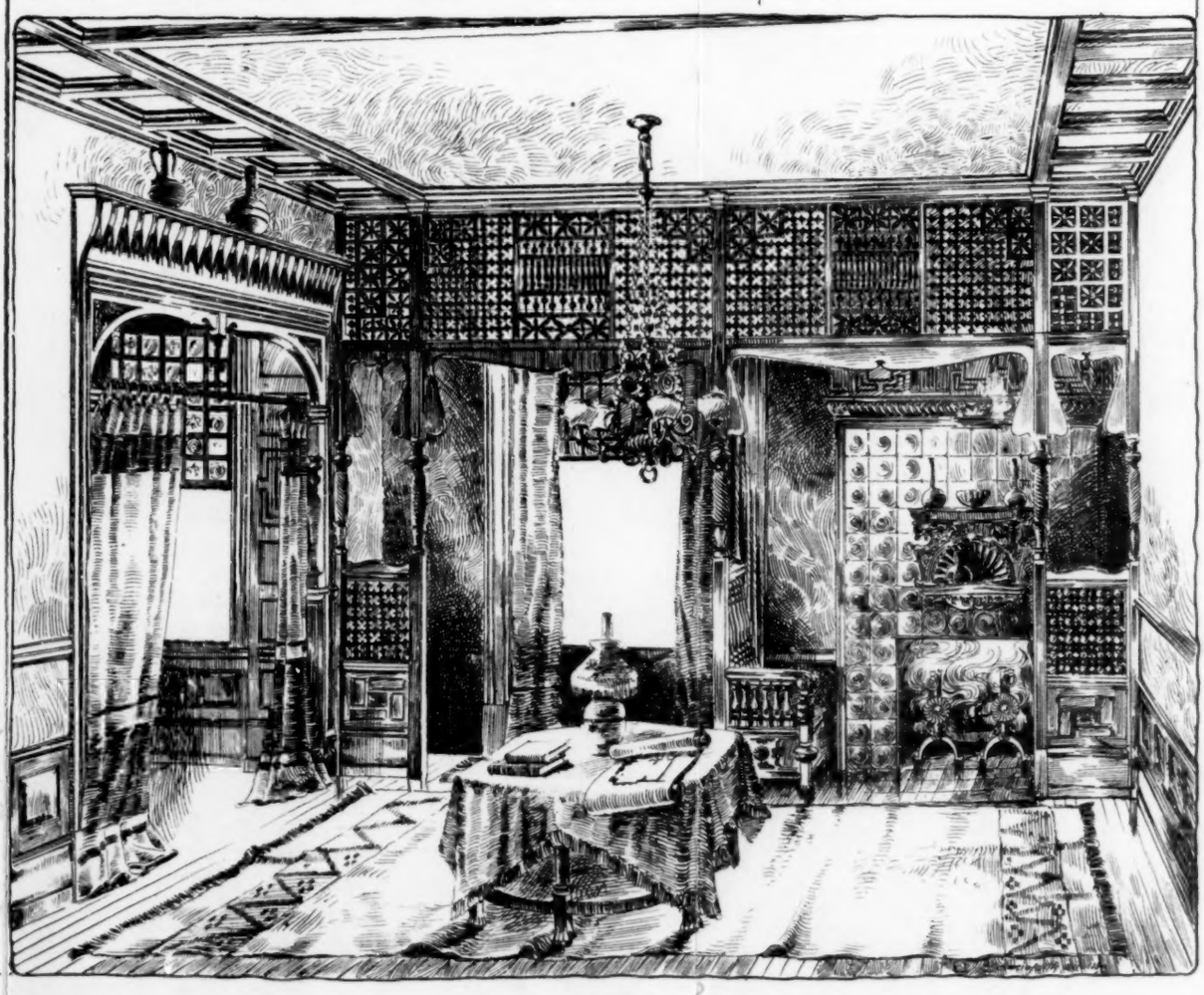
MANTEL IN LIBRARY.

PLAN.

IN ONE OF THE CORNER APARTM'TS OF "THE BERKSHIRE." N.W. COR. OF 52D ST. AND MADISON AV. NEW YORK.

MR. CARL PFEIFFER, ARCHITECT.

THE PARLOR.



to secure a sound, compact bottom, the concrete ought to be thrown in from a staging at least six feet above the level of the trenches. This "long drop" is solemnly prescribed in specifications, and rigidly enforced in practice. We have known an architect insist on the resurrection of some twelve cubic yards of concrete which had been peacefully deposited in the trenches — *non requiescat in pace!* — because, forsooth, he declined to take the builder's word that it had been thrown in from a "proper height," and would not be content until he had seen the operation with his own eyes. To what purpose? If six feet is a good height, twelve feet would be a better, and so on, until — what would be the effect of dropping concrete into a trench from a balloon, say five hundred feet above the level of the ocean? Would not the mixture be a trifle scattered before it reached its destination? Throwing in concrete from a height is supposed to consolidate it, but does it really do so? If two bodies of unequal weight in proportion to their bulk be let fall from a height at the same time, the heavier body will reach the ground first, and the greater the height — that is, the longer they are exposed to the action of gravity — the greater will be the difference of time in which they will reach the ground. Now, the ballast or gravel which forms the principal ingredient in concrete, is just twice as heavy as the lime with which it is mixed, and it follows, therefore, that the greater the height of the staging from which concrete is thrown, the greater is the tendency to unmix it, by sending all the ballast to the bottom and all the lime to the top. Let there be no "long drop," then, but let the concrete be thoroughly mixed, wheeled in at a level, and well rammed.

Of all bottoms for building, perhaps a coarse, wet gravel is the best — a good, firm gravel that shows a clean and almost vertical side when cut into with the spade, and with such a bottom concrete is rarely required. Of clay we have already treated; but there is a kind of blue shale which forms an excellent foundation, so long as it is preserved from the action of the weather by a layer of concrete, but if left open to the atmosphere it will slake and become quite soft. Underground water-courses are occasionally to be met with, and are exceedingly dangerous to all foundations. Sometimes they can be conveyed away in drain-pipes, and occasionally it is necessary to arch over them; but it is never advisable to interrupt their course without providing some means of passage for them, as they are liable to unsettle the surrounding soil to an incalculable extent. It is generally supposed that no foundation better than a rock is anywhere obtainable, and Scriptural authority instances the "wise man who built his house upon a rock." No doubt there are rocks and rocks, and although we do not question the stability of the Eddystone rock, still the question arises, with some rocks, as to what is underneath them? Small masses of rock usually lie in loose, shifty beds composed of their own fragmentary débris, and in large masses, where the strata dip considerably, there is danger of their cracking and slipping. Here concrete will come into requisition to bring the bottom up to one level. A great difference in depth should never be made suddenly between two parts of a building, either in brickwork or masonry, as the greater number of mortar joints in the deeper portion cause, in setting, cracks in the walling above. Where there is a change of depth in the foundation of a wall, it should be made gradually in steps of about four feet high, so as to divide the difference in the number of joints.

A totally unyielding bottom, such as solid rock, is at times undesirable. Suppose we have a wall of brick or rubble faced with ashlar. The greater number of joints in the former will cause a greater reduction of height in setting, and the facing may thus have to sustain a superincumbent weight which should have taken its bearing upon the walling behind, and which may crush the ashlar if the bottom be unyielding, but if the bottom yield the ashlar will sink so far as to find its level within the hearting or walling behind it. Above all, in foundations let the materials be solid and good. Eschew burrs or place bricks, and remember that good stock brickwork in mortar will safely carry between eight and nine tons for every square foot of sectional area.

DAMAGES FROM BLASTING. — A LEGAL CASE.

COLTON *vs.* ONDERDONK.

SAN FRANCISCO, CALIFORNIA.

A SUIT has lately been decided in the Superior Court where the plaintiff sued for damages to his residence caused by blasting on the adjoining lots.

In 1878 the defendant, Onderdonk, entered into a contract with Messrs. Fair & Flood (of the Bonanza firm) to grade the lots on California Street which adjoin the property of the late D. D. Colton, Esq.; the upper surface soil was apparently sand, loam and loose rock, but after removing this to a depth of two or three feet, shale or trap rock and boulders were met which necessitated blasting to keep the large force of men busy, and also to make a profit on the work.

As it was proven the work of blasting was put in charge of an incompetent man, who laid such heavy charges as to blow in the plate-glass windows of the Colton house, and cause large cracks in the frescoed walls and joints of the wood-work. Upon the appearance of these an injunction was served, and the work was afterward carried on under the supervision of an engineer.

Upon suit being brought for damages, the defendant, outside of the usual technicalities resorted to for a nonsuit, set up the defence: first, that due care was used in the grading of the lot, and second, that the house was poorly constructed and the damage was mainly caused by settling and shrinkage.

The writer was called as an expert to make an examination, to give estimate of damages, and to suggest a theory of the cause of damage. At that time the attorneys for plaintiff and others consulted were under the impression that a shock similar to an earthquake had shaken the house, but the writer thought otherwise, and as was afterwards proven, rightly suggested the theory that concussion of air did the damage.

From trials made, at a distance of ten feet from where earth is loosened no visible tremor is felt in the hard soil after a very hard blast has been exploded. Damages were estimated at $15,000.

The writer was sustained by two artists in court in saying that the frescoing could not be patched so as to be equal to original work and of course would have to be done over complete, one estimating $9,000, the other $11,000, as the cost of replacing the same. After proving even by witnesses for defense that the house was more than well built, the defense put on some curious witnesses, one of whom testified that a charge of one hundred pounds of powder was not heard across the street in a house where he and another were listening. Another, a fresco artist, would patch up for $475, though there were not less than one hundred and fifty large cracks which would have to be done; upon being cross-questioned he acknowledged the fact that about ten three-quarter-size nude figures would have to be replaced at an expense of two thousand dollars alone, and the gold might cost from one to ten hundred dollars, yet he persisted in saying he would do the whole for four hundred and seventy-five dollars.

Without going into further details of the trial, which lasted over six days, the interesting point was the charge of the judge to the jury, in which he says "*no matter how carefully the work was done* the defendant is liable for all damage done to the surrounding property."

The jury, after a short deliberation, gave a verdict for plaintiff placing damages at $7,500.

The case is now on appeal, and I will send the decision as to some legal points which may be of interest to you. S.

THE BURNING OF THE RATH-HAUS TOWERS AT AIX-LA-CHAPELLE.

IT is a common saying that "they do these things better in France." Now, however inferior we may be supposed to be by some people to the French, we may certainly pride ourselves in being immensely in advance of the Germans in our methods of extinguishing fires when they break out in our towns. Notwithstanding what we have to say of some individuals who appear to have acted with good sense and courage, we have little hesitation in asserting that such a scene of muddle and confusion as that witnessed at Aix-la-Chapelle could scarcely have taken place in any English village, to say nothing of a large and important city.

If we may believe a writer in the *Germania*, no decided effort was made to extinguish the fire which broke out in one of the narrow streets surrounding the town-hall, until several houses and the town-hall were noticed to be on fire. The writer says that one good common-sense woman extinguished the fire which had broken out in one of the houses, by emptying the contents of a tin jug upon it two or three times, showing how easy it would have been to extinguish the conflagration if it had only have been taken in time; but, wonderful to relate, although smoke was seen rising from the "Granusthurm," or eastern steeple of the town-hall, nothing whatever was done to "extinguish the fire for over twenty minutes!" The good old woman with her tin jug would have settled the matter in a few seconds, but the whole force of German officialism, with its cumbrous police of arrangements, was evidently struck all of a heap by a fire breaking out in a town-hall; so for twenty minutes no efforts whatever were made to save this magnificent old structure, while the German police, firemen, and Government officials were looking on. The Granusthurm burst out into flame, the streams of molten copper and lead pouring down in all directions, until, at last, with an immense crash, the great bulbous spire fell in, setting fire to the roof of the Kaisersaal, which occupies the space between the two great towers. Now, will it be believed that a large force of military and police were present, but that, instead of making any attempt to save the noble old Rath-Haus, or *even to extinguish the flames*, they occupied themselves in taking the furniture out of the houses which were not in flames, though it is evident from the writer in the *Germania* that the crowd had absolutely called attention to the fact that the Granus-

thurm was in danger of destruction? With such blundering it is by no means wonderful that the other lofty steeple at the west end of the Rath-Haus, which stands over the repository for the town records, was soon on fire. The force of the flames was now so intense that this vast tower twisted round and fell headlong into the blazing mass. Twenty other buildings, chiefly private houses, were soon on fire, and the greatest danger was anticipated for the wonderful old Cathedral, the iron-work upon the roof of which was red-hot. The fire, however, which up to this time appears to have received little check at the hands of man, did at length meet with an obstacle raised by hands which have for five centuries gone to their rest, and this was the splendidly-constructed vaulted roof of the Kaisersaal, which resisted the force of this burning furnace, the streams of molten lead and copper, the fall of the timber spires, and all the other dangers. It is simply wonderful, the safety which a vaulted roof is to a building. The cathedrals of Chartres and Rouen, and the choir of Canterbury, would have been reduced to ruin by fire but for their roofs of stone. York Cathedral has been twice reduced to ruin through its roof vaulting being composed of timber. Judging from Hollar's view of Old St. Paul's the vaulting over the nave of that church appears to have been constructed of wood, and this may account for its destruction in the Great Fire of London.

When the old Houses of Parliament were burned down, everything was destroyed, except the cloisters and crypt of St. Stephen's Chapel, and these were the only portions of the building which were vaulted in stone.

That the Kaisersaal at Aix-la-Chapelle owes its safety to this cause alone need scarcely be a matter of doubt, for every single thing that could be burned was burned until the fire met with this obstruction. And does this not caution us that no public building is safe from the danger of fire without a stone or brick or concrete vault?

When one thinks how comparatively cheap vaulting is, how unaccountable is the fact that in England we hardly ever make use of it, even in our churches!

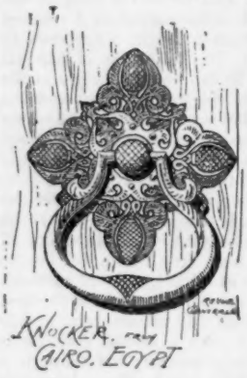
But for this stone-vaulted roof not only the Rath-Haus at Aix-la-Chapelle, but the Cathedral,—nay, the whole town,—might be now a heap of ashes. We should strongly recommend the good people of Aix-la-Chapelle to vault even their private houses with brick or stone, because if the intelligent officials whose duty it is to put out fires stand by and look at a public building burning for twenty minutes or half an hour without its striking them that a little water might be of use, it is highly probable that a good deal of burning may take place in the fine old city, and they cannot always trust to having the good old lady with her jug at hand. Our readers will scarcely believe that this fire at Aix-la-Chapelle broke out at two o'clock in the afternoon, so that it was immediately discovered, nor will they wonder less when we tell them that the very writer in the *Germania*, who has given such a graphic account of the matter, absolutely warned the authorities of the city only eight days back of the great danger of such a catastrophe and of the inefficiency of the arrangements to avoid or subdue it. We trust, however, that the very severe lesson which the authorities of the town have received may not only make them more vigilant and careful and more prepared to cope with such an outbreak in future, but that it may also read a lesson to people nearer home. Fires are certain to take place in our towns, and the danger from them does not decrease. On the contrary, the use of mineral oils and other inflammable substances, the luxurious habit of over-furnishing our houses, the rage for light gauzy substances, lace curtains, toilet covers, etc., add not a little to our danger, nor does the flimsy mode of construction adopted by our speculative builders in any way lessen our risks. We have seen an old half-timber house at Würzburg on fire, which, after three days' burning, was only injured as to its roof and upper story, whereas a short time back we saw a "neat and compact desirable brick residence" at Notting-hill burned literally to the ground in half an hour!

We do not think that the regulations with regard to fires are half severe enough, either here or on the Continent. We have frequently seen houses to let in which the hearths are all cracked and broken. Now, every house which has the hearthstone broken is in danger of catching fire. We frequently find stoves set in such a manner as to leave a deep hole on either side. These holes, which it would not probably have cost the builder 2*d.* to fill up when the stove was "set," are a serious cause of danger; the soot from the chimney falls into them, and they become clogged, they catch fire and burn for days until at last some spark finds its way to a concealed beam, and in a few hours the house is burned down.

We caution our readers and the public in general whenever they *smell burning in a house* never to rest until they have found out whence the smell proceeds, and, if there is any danger, at once to remove all risk at any trouble or inconvenience.

We have in this notice of the fire at Aix-la-Chapelle taken our view of the case from a writer in the *Germania*, and, of course, do not vouch for all the facts which he states; but as he was evidently a spectator of the scene, as he writes with a thorough knowledge of the subject, and, moreover, as he had previously cautioned the authorities to expect such a catastrophe, the result of which has fully justified his forebodings, we cannot help thinking that there must have been a great absence of proper precautions against the outbreak of a fire, and a most unwarrantable delay in making the most ordinary attempts to extinguish it. Knowing, as we do, how well-trained the members of the German fire-brigades generally are, we do not doubt that when they were called out they did their duty; but either their machinery must be cumbrous and out of gear, or something must have been wrong somewhere to cause such an unaccountable delay. We rather fancy that the unwieldy system of German officialism and "red tape" may in some way account for it. We have all heard the story of the king who was burned to death because "the courtiers could not settle amongst themselves whose duty and office it was to put out the flames." Possibly something of the same kind may have taken place at Aix-la-Chapelle.—*The Builder.*

MOISTURE IN WALLS.



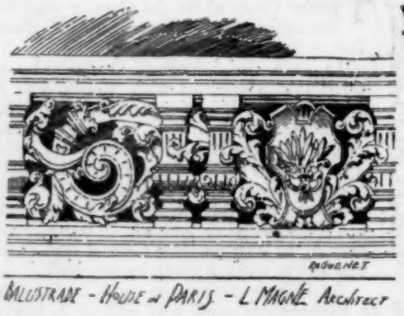
Dr. W. Hesse, a district medical official at Schwarzenberg, has communicated to the technical press of Germany a simple process for the quantitati e definition of the free water which may be contained in a wall. For the carrying out of this process it is necessary to have a number of small glass flasks with glass stoppers. These should be of about one-half to five-eighths of a cubic inch capacity and of known weight. A small portion of mortar sufficient to fill one of the flasks is taken from the internal surface of the wall by boring with a tool specially constructed, and also by scraping from the wall, a piece of paper being held underneath. After the removal of any large unporous particles, the flask is filled rapidly, and well-closed with an india-rubber stopper. In the laboratory the flask itself, as well as the inner surface of the neck, is carefully dusted, the glass stopper is inserted and the flask weighed. It is then exposed in a drying-oven to a temperature of 212° to 230° Fahrenheit until the mortar is completely dry, this process usually taking several hours. The flask is then allowed to cool in an apparatus specially designed for the purpose and is again weighed. By deducting the weight of the vessel (as previously ascertained) the difference between the weight of the mortar before and after the drying is arrived at, and the percentage of moisture is thus established.

It is remarked that the mortar should not be exposed to the air more than absolutely necessary, and that consequently sifting is not to be recommended. In applying this test to inhabited rooms it is difficult to choose a spot for the trial referred to, and when any part of the wall is already broken such places can be utilized. As a general rule, such portions as are covered and are exposed to the sun's rays in summer or the heat of a stove in winter are to be avoided as not affording reliable data on the subject referred to. The best way, it is remarked, is to collect a number of specimens from the various walls of a room, taken at various heights, the principle of the test allowing of a number of trials being made.

From the results of numerous experiments made in his own district, Dr. Hesse has established the fact that walls of inhabited rooms (practically regarded as being dry) contain about one per cent of free water, no matter of what composition the mortar may be. In Munich, the tests made by other scientific men prove that rooms more or less underground contain in their walls a proportion of moisture increasing with the greater depth arrived at. Thus near the ceilings in such case the quantity is less than near the floors, where the proportion is sometimes fifteen per cent, or even more.

In his contributions to the press, Dr. Hesse has also referred to various facts of minor importance in connection with his process. He acknowledges that it may not in all its details answer the requirements of analytical science, but claims that it gives a practical man a method of carrying out easily and rapidly a great number of trials. The results arrived at are, he maintains, accurate enough to allow of the composition of walls being estimated in such a manner as to give some reliable data affecting the connection between damp walls and the health of those who live in the rooms which they encompass.—*The Builder.*

A TEST OF STRAW LUMBER.



The *Northwestern Lumberman* gives the following interesting account of a practical test of the usefulness of straw lumber: Some of the straw lumber from the factory at Lawrence, Kan., which was purchased by John V. Farwell, was placed in his new building on Market street, Chicago, as ceiling, in which direction it serves very well, while a floor of the same material was put into a wholesale building, on the opposite side of the street. For

this use the lumber has come considerably short of the confident expectations entertained for it by both the producer and the buyer. It has made a very poor floor. This is more particularly because the material furnished is by no means equal to certain samples of straw lumber which have been shown. If it were as good as the best that has or can be turned out, it might be a very different question about the success of the flooring material. The floor in question, which the *Lumberman* representative was given opportunity to inspect, was not such a floor as would satisfy anybody very fastidious. Practically it was not a success. It is laid in inch-thick slabs about three feet square, each of which is fastened in position by small nails driven closely together around every side.

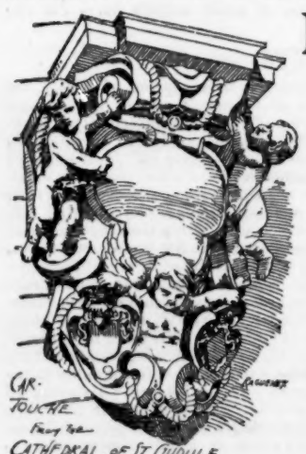
In this case the straw lumber appears to have been laid as an experiment over another floor, the slabs being first treated to a peculiar solution, which the man who had the floor on his hands stated was composed of lime and smear-kase. There was considerable trouble and expense attendant upon laying it, the slabs requiring to be placed and jointed very carefully. There was in fact more elaboration about the means than the end justified. The stuff was neither durable enough for the purpose nor devoid of warping tendencies. It was not invulnerable to the attacks of moisture and heat, the result being occasional uneven patches of surface, blisters, etc., while some of the pieces withdrew from any intimate associations with the nails, leaving part of their property behind. Where water was spilled on the floor the industrious application of a broom amounted to a triturating process. The mills had not turned out a batch of stuff that was equal to the emergency, no matter what might have been done.

It is very obvious that the utility of straw lumber depends entirely on the question of making the best possible article, and having it of uniform strength and character. The possibilities respecting future results are by no means depreciated. In the course of time, when experience shall have demonstrated what can be done in that direction, it would not be strange if the process of making straw lumber, or some similar material, will have resolved itself into an unquestioned triumph, while the newspapers will have a great deal to say about vegetable iron.

The safest way now, and that is largely the view taken by the manufacturers, is to apply straw lumber to numerous smaller uses which will not require the maximum of strength or endurance, until such time as there will be no question about the capability of the machinery in use to make it, and no uncertainty about the character of the material and its reliability. There are, in fact, a great variety of ways in which it can be employed, and the mere fact of a few discouragements at the outset, by which the lumber may appear at a disadvantage, does not do away with the probability that the most of these difficulties will be conquered, and that the scope of straw lumber in the future will be a wide one in industrial economies.

There is too much lumber now in the market, and some of it too cheap to really make it much of an object to put a new material, which has not the virtue of costing any less, into more or less heavy uses, which, to a certain extent, are experiments. The *Lumberman* has watched straw lumber from the start, has aimed to candidly consider its claims, possibilities and drawbacks, and it still has considerable faith in it on the whole as a future success.

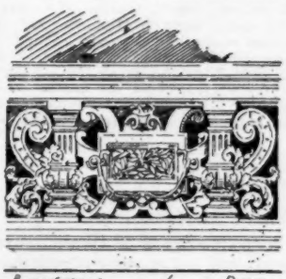
MICROSCOPIC ORGANISMS IN BUILDING MATERIALS.



POROUS materials, such as bricks of baked clay, are often observed to become friable or pulverulent to a variable depth on their exterior, and this occurs especially where the baking has not been sufficient. M. Parize, in dwelling upon this subject in *La Nature*, writes as follows: "This species of caries, thus begun, gradually enters the brick to a greater and greater depth, and ends by reducing it to powder. Up to the present time this phenomenon has been attributed to the action of moisture, to alternations of heat and cold, etc.; but from the observations which I am about to relate, it is probable that these agencies are merely secondary ones, and that they have the effect only of favoring the action of the true cause of destruction, which, from what follows, should, as a general thing, be referred to the development of microscopic organisms. One day, on examining some mucedines that had vegetated upon a brick partition in the interior of a closed apartment which was somewhat damp, I remarked that the plastering exhibited blisters or bubble-like projections at certain points. On puncturing one of these, there issued from it a very fine red dust that had resulted from a pulverization of the brick. I at once thought of the presence of larvæ or of insects, and therefore looked for these, with a lens, among the débris. Finding nothing, I had recourse to the microscope, and, under a magnification of about three hundred diameters, saw in the midst of the débris of the diatoms and silicious algæ that had belonged to the clay from which the brick was made, an immense number of living microscopic organisms. The existence and propagation of these proto-organisms in such an environment beneath a continuous layer of plaster five to six mm. thick, has a right to surprise us; and yet this is not all. Having cleaned the rotted surface of the bricks with a stiff brush, I drilled a hole therein about thirty mm. in depth, and examined under the microscope the dust taken from the bottom of the cavity. The same organisms showed themselves, but not in so great a number (about one hundred per square centimetre of the preparation, instead of one hundred and fifty that were met with in the first observation). All the bricks that exhibited the symptoms of deterioration just described offered the same microbes in varying number. The microscopic preparation was made in each case by dropping a pinch of the dust to be studied into a few drops of pure water or alchohol, and taking a drop of the supernatant liquid. The conclusions to be drawn from these facts are numerous. They show us in the first place, that germs and spores may be preserved, so to speak, indefinitely, within surroundings that are eminently protective to them, and where no one up to the present time had dreamed of going to look for them.

"Hence is explained the utility of the disinfecting processes that are employed in apartments, hospitals or stables, in which cases of contagious diseases have occurred. The scraping and whitewashing of walls are the only prophylactic means that have, up to the present time, a known effect. It may be easily seen that these operations remove from the walls the permeable layer in which the parasitic germs have been enabled to establish themselves and multiply therein in a different stage of development from that under which they determine well-known morbid effects. Besides, these observations establish the fact that the rôle of the infinitely small is to be taken into account in the duration of buildings and other structures. We might possibly seek here the reasons for the rapid destruction of numerous Semitic monuments built of slightly baked or merely sun-dried bricks by the Assyrians and some other ancient peoples. Finally, this same cause may possibly play a rôle in the disintegration of schistose rocks, and of the agglomerates or clods that enter into the composition of arable soils."

USE OF THE THERMOMETER IN HOUSES.



SOME interesting remarks have been lately published by M. Gaston Tissandier on the difficulties presented by thermometrical observations of the temperature in rooms, no part of which is the same, especially when a fire is burning. Desiring to ascertain the extent of these differences of temperature in the same room, he had a good fire made in his study, and measured the temperature at various points by means of an accurate thermometer constructed by M. Tonnelot. He allowed the thermometer to remain for more than ten minutes at each point, and only registered the degree after two successful readings, taken two minutes apart, gave the same indication. M. Tissandier took, for his observations, three different heights, which, with the temperatures, we have converted into English measurements, viz.: 4 inches from the floor, 5 feet above the floor, and 8 inches below the ceiling. Placing the thermometer in the middle of the room, and 6 feet 6 inches from the fireplace, the temperatures were, for the same vertical line, 67 degrees Fahr. near the floor, 69 degrees midway, and 70 degrees near the ceiling. Observations made out of the fire's influence, and 3 feet from a wall, above 65 degrees near the floor, 66½ degrees in the middle, and under 70 degrees near the ceiling. At a distance of 3 feet from the window, the joints of which were very defective, the thermometer registered 64 degrees near the floor, and 65¾ degrees near the ceiling; while just near the joints of the window, the following readings were taken; 61 degrees at the bottom, 62 degrees in the middle, and 64½ degrees at the top. The temperature over the mantelpiece was 71 degrees: in fact the temperature of the room varied from 61 degrees to 71 degrees, that is to say, between 10 degrees of Fahrenheit's scale. M. Tissandier also found a difference of 1¼ degrees Centigrade, or 2¼ degrees Fahr., on comparing four high-priced thermometers; and it is probable that cheap instruments would show greater variation. To arrive at the mean temperature of a room with sufficient correctness, M. Tissandier advises that a strong thermometer, obtained from a good maker, be swung round and round by the wrist for about two minutes in two or three different parts of the room, and that the average of the readings be taken, at the same time observing the precaution of making sure that two successive readings correspond. An approximate idea may, however, be obtained by placing the thermometer on a piece of furniture, so that it may be out of the influence of the fire and of the windows. — *The Architect.*

A BOOK ON MORTARS.

Charleston, Kanawha Co., W. Va., July 21, 1883.

To the Editors of the American Architect: —

Dear Sirs, — If you have a reliable treatise on mortars, cements, etc., send description and price of same, to Wm. R. Malone.

[Gillmore on Limes, Hydraulic Cements and Mortars. Published by Van Nostrand & Co., New York. Price, $4.00. — Eds. American Architect.]

FLITCH-PLATE GIRDERS.

Boston, July 16, 1883.

To the Editors of the American Architect: —

Dear Sirs, — My attention has been called to two errors in the article on flitch-plate girders, published on page 255 of the *American Architect* of June 2.

In Formula 1, the number 720, before t, should read 750, as in Formula 2; and in the value for D, eleventh line from the top, second column, the sign between the numbers 12 and 1500 in the denominator should be + instead of ×. The equation is worked out for the sign +, but in copying the manuscript the sign was changed, as was also the number 750, above referred to. Respectfully,

F. E. Kidder.

EXTERIOR PLASTER-WORK ON WIRE-LATH.

July 26, 1883.

To the Editors of the American Architect: —

Dear Sirs, — I wish to cement face or plaster upon wire lathing the exterior of a frame house. Selenitic cement has been recommended to me for that purpose. What material and method of application has been found the most successful? And finally, if the best be employed, what will be the durability of the same? Is it liable to crack, etc., by shrinkage of the framing timber, or the materials of which the plaster is made?

Very respectfully yours, J.

[We have never used selenitic cement, but think it might be excellent for the purpose mentioned. Lime mortar, with a greater or less admixture of cement, is commonly used, and as generally employed in gables or other places somewhat sheltered from the weather, will stand for many years. For work on a larger scale, or near the ground, cement only is used. Fresh Rosendale of the best quality would probably answer, if its color were not objectionable, though Portland would be better; and selenitic cement ought to be nearly as good as Portland, and of a better color. A considerable admixture of sawdust is advantageous for binding the mortar together, and so made, and put on wire lath, it ought to be nearly indestructible. If the furrings to which the wire is nailed all run in the same direction, and are so put on as not to be moved by the shrinkage of the timbers to which they are themselves nailed, there is very little danger of cracks in the coating, even with lime mortar. The wire lathing should, however, be of the heaviest quality, as the springing of a weak lathing is apt to cause the mortar coat to peel off in places, while being rubbed with the trowel. It is common with the lighter qualities to put the furrings six or eight inches from centres. — Eds. American Architect.]

SEASONING BUILDING-STONE.

Chicago, July 25, 1883.

To the Editors of the American Architect: —

Dear Sirs, — M. Viollet-le-Duc in his "Story of a House," says that stone, after leaving the quarry, will get a weather-resisting crust by the aid of their quarry water, which once taken off will never be re-formed afterwards; and for which reason it would be best to cut the stones when fresh from the quarry and not afterward, or cut them only roughly before, and dress them after they have been built. But in another article (which appeared, I think, in your paper) I read that the excellent preservation of stone on some historic buildings in England is due to their seasoning, *i. e.*, they had been lying at the seaside (if I remember) for one or two years to season, before they were used in the building. You would oblige me by stating in your paper which method is the best, and if Viollet-le-Duc is wrong? Very respectfully, A Subscriber.

[Viollet-le-Duc speaks particularly of limestone, which is the common building-stone in France, and, as he says, acquires, if cut while fresh, a hard coating by the evaporation of the "quarry sap," and the crystallization of the dissolved mineral matters in the superficial pores of the stone. With the sandstones, containing little or no lime, which are generally used in England and in this country, the quarry-sap contains usually much less crystallizable matter, and while some sorts get a hard skin if cut while fresh, others show no difference. As a general rule, the more thoroughly dry a stone is when placed in the building, the better, and even where stones require to be cut while fresh to secure the natural patina, it is advantageous to leave them after cutting until completely dried out, before setting them in place. — Eds. American Architect.]

NOTES AND CLIPPINGS.

British Building Societies. — The Scotch, compared with the English, have hitherto made scarcely any effort to provide themselves with better houses through the agency of building societies. It is estimated that, at the present time, there are in the United Kingdom no less than 750,000 members of building societies; and out of this number only 14,000 belong to Scotland and 7,000 to Ireland. No satisfactory explanation can be given of this striking disparity. The difference between England and Scotland is probably in part due to the fact that the system of registration of building societies is less complete in Scotland. But after making due allowance for this circumstance, it seems difficult to resist the conclusion that the thrift for which the Scotch are proverbial has unfortunately in too many cases not hitherto assumed the form of providing themselves with good dwellings. — *Macmillan's Magazine.*

Sinking Piles by the Water-Jet. — *Engineering News* translates from the *Annales des Travaux Publics* a short description of the method used in sinking the piles for the foundation of the Palais de Justice at Brunswick (Prussia): —

A framework with hoisting fall somewhat similar to the ordinary pile-driver, was used in placing the pile in position ready for sinking; two tubes, each two inches in diameter, with the lower ends bent inward toward the point of the piles, were attached to the pile by iron staples; at the upper end each pipe was connected by a short section of rubber hose to other pipes connected with the city water-main, which water-supply was in this case under a pressure of four atmospheres. The piles usually sunk by their own weight into the hole formed by the water-jet, as soon as the valve was opened, making connections between the tubes on the pile and the water-main. To hasten the rate of settlement, a vertical iron bar three feet long was set into a hole bored in the head of the pile, and upon this were placed iron weights of two hundred pounds each, as the resistance might require. Piles twelve inches in diameter were sunk in this way to a depth of fifteen feet in ten minutes' time. The least time required for a depth of fifteen feet was two minutes, the longest time for same depth was thirty minutes. As long as the water-jet was in operation at the foot of the pile it was possible to give the pile a rotary motion, and thus facilitate the descent; but as soon as the jet was stopped the pile became immovable. As a proof of their stability a dead weight of fifty tons was applied to some of them, and it was found that their resistance was entirely independent of the time consumed in sinking them. To sink twenty piles by this method required the use of about two thousand gallons of water; seven or eight laborers were employed, and one gang put down from six to fourteen piles per day.

L'Eglise du Sacre Cœur. — The great Church of the Sacred Heart, now in course of construction on the heights of Montmartre, Paris, is at the present season being visited by thousands of persons daily, numerous expeditions, which the French dignify by the name of pilgrimages, having been organized from nearly every parish in Paris and around, for the purpose of inspecting the progress of this great religious undertaking. After the services that are held every day in the temporary chapel, the congregation forms into procession and visits the work. First making the round of the entire edifice, the *cortège* enters the main body of the church, and truly curious but at the same time imposing is the view of the long procession with crosses and banners at their head, wending in and out of the wilderness of scaffold-beams, amid the grinding noise of the material-wagons, and the shrill whistle of the steam-engines. The crypt of the building, which is entirely freed from scaffolding, may now be seen throughout, and its grand proportions serve to give some idea of the scale upon which the future cathedral is designed. A chapel devoted to the offering of prayers for the dead, has already been opened here in the middle of the great nave, exactly under the spot where it is intended to erect the high altar of the upper church. The outline of the main building, which twelve months ago was scarcely commenced, is now taking form; the side walls are built to about half their height, and before the end of the year it is hoped to bring them up to the spring of the vault. The first six courses of the circumference of the choir are finished, while the second course of the apsidal side chapels is being placed. At the other end of the church the double porch preceding the principal entrance is already covered in, and the latter will be next begun. The financial prospects of the work were never brighter than at the present time, the subscriptions received during April having amounted to 126,964 frs., 48 c., against an average sum of 92,000 frs. received in the corresponding month of the ten previous years. The total amount collected up to the present reaches 12,500,000 frs., of which 11,700,000 frs. have been expended, leaving in hand an available balance of about 800,000 frs. — *The Architect.*

Spontaneous Combustion of Soot. — In the spring of 1780, a fire was discovered on board a frigate off Cronstadt. After the severest scrutiny, no cause for the fire could be found. The probability is, however, strongly in favor of spontaneous combustion; for, in the following year the frigate Maria, which also lay at anchor off Cronstadt, was found to be on fire. The fire was, however, early perceived and extinguished. After strict examination nothing could be discovered as to its origin. A commission of inquiry was held, which finally reported that the fire was probably caused by parcels of matting tied together with pack-thread, which were in the cabin where the fire broke out. It was found that the parcels of matting contained Russian lamp-black, prepared from fir-soot moistened with hemp-oil varnish. In consequence of this, the Russian Admiralty gave orders for experiments to be made. They shook forty pounds of fir-wood soot into a tub, and poured about thirty-five pounds of hemp-oil varnish upon it. This stood for an hour, after which they poured off the oil. The remaining mixture they wrapped up in a mat, and the bundle was laid close to the cabin in the frigate Maria where the midshipmen had their berth. To avoid all suspicion two officers sealed both the mat and the door with their own seals, and stationed a watch of four officers to take notice of all that passed through the night. As soon as smoke should appear information was to be given. The experiment was made about the 26th of April, at about 11 A. M. Early on the following morning, about 5 A.M., smoke appeared issuing from the cabin. The commander was immediately informed by an officer, who, through a small hole in the door, saw the mat smoking. Without opening the door, he dispatched a messenger to the members of the commission; but as the smoke became stronger and fire began to appear, it became necessary to break the seal and open the door. No sooner was the air admitted than the mat began to burn with greater force, and presently burst into a flame. Mr. Georgi, of the Imperial Academy of Sciences, was appointed to make further experiments, the result of which confirmed the suspicion of spontaneous combustion in a remarkable degree. — *Chambers' Journal.*

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.]

281,661. FIRE-ESCAPE. — Orin R. Bowie, Portland, Me.

281,679. WALL-DECORATION. — Henry Fechteler, New York, N. Y.

281,685. GAS-STOVE. — Edward E. Gold, New York, N. Y.

281,692. AUTOMATIC GATE. — Daniel Hershberger, Millville, Ind.

281,701. KNOB ATTACHMENT. — John Kirby, Jr., Ludlow, Ky.

281,713. LOCK. —Frank W. Mix, New Britain, Conn.

281,714. SASH-FASTENER. — Alphonse Mountant, New York, N. Y.

281,721. WOOD-FILLER. —Richard Parke, New York, N. Y.

281,722. SYSTEM OF LAYING SUBTERRANEAN ELECTRICAL CONDUCTORS. — Wm. R. Patterson, Chicago, Ill., assignor to the Western Electric Company, same place.

281,726. DAMPER REGULATOR, INDICATOR, AND LOCK. — E. Otto Pohl, Philadelphia, Pa.

281,748. SHUTTER-WORKER. — Ambrose C. Wyckoff, Danville, Va.

281,749. HYDRAULIC-RAM. — George Yellott, Towson, Md.

281,761. SQUARE. — Charles W. Green, Brooklyn, N. Y.

281,768. SASH-FASTENER. — Morton Judd, Wallingford, Conn.

281,781. HYDRAULIC ELEVATOR. — Wm. H. Milliken, San Francisco, Cal.

281,795. HEATING-STOVE. — C. L. Ridgway, Boston, Mass.

281,802. WEATHER-STRIP. — Jno. Shoemaker, Garner, Io.

281,805. EXTENSION-LADDER. — Joseph Spangler, Rock Island, Ill.

281,822. LOCK. — Jacob S. Aydelot, Xenia, Ind.

281,831. WOOD-SCREW. — Israel F. Brown, New London, Conn.

281,897. RADIATOR. — Thomas McAvity, St. John, New Brunswick, Can.

281,920. BIT-STOCK. — Wm. L. Parmelee, Ansonia, Conn.

281,964. WINDOW-SCREEN FRAME. — Edmund J. Brent, Muscatine, Io.

281,965. CEMENT COMPOUND. — Walter J. Budington, Pittsfield, Mass.

281,968. FLOOR-CLAMP. — Ernest Caywood, Vining, Kans.

281,977. ADJUSTABLE LADDER. — Nelson Coons, Elizaville, N. Y.

282,004. HINGE. — David McCurdy, Ottawa, O.

282,005. SASH-FASTENER. — Riley McCloskey, and Daniel J. Coleman, Walla Walla, Wash.

282,018. KEY-HOLE GUARD. —John P. Wilkinson, Abbeville, Miss.

SUMMARY OF THE WEEK.

Baltimore.

HOTEL. — Mr. E. F. Baldwin, architect, has prepared drawings for Robert Rennert, Esq., for a six-st'y and basement building, designated Rennert's Hotel, to be erected on the cor. of Saratoga and Liberty Sts. It will be built of granite and brick, with stone and terra-cotta finish, 86′ x 120′, contain 130 rooms, and cost $180,000; Henry Smith & Son, superintendents.

BUILDING PERMITS. —Since our last report thirty-one permits have been granted, the more important of which are the following: —

Fred. Schonewolff, three-st'y brick building, s s Warren Ave., e of Henry St.

Henry Wessell, three-st'y brick building, s s Warren Ave., e of Henry St.

Chas. A. Carpenter, 15 three-st'y brick buildings, e s McCullough St., s of Presstman St.

Jas. Airey, 2 three-st'y brick buildings, e s Druid Hill Ave., n of Robert St.

Jackson Musselman, 2 three-st'y brick buildings, e s Druid Hill Ave., n of Robert St.

Swindell Bros., three-st'y brick building, cor. Bayard and Warren Sts.

C. D. Blake, 5 three-st'y brick buildings, e s Park Ave., bet. Hoffman and Dolphin Sts.

A. A. Reinhart, 11 three-st'y brick buildings, w s Calvert St., bet. Lanvale and Townsend Sts., and 13 three-st'y brick buildings, w s Calvert St., bet. Lanvale and Federal Sts.

Ansley Gill, 5 three-st'y brick buildings, commencing s w cor. Ramsay St. and Addison Alley.

Robert Rennert, six-st'y and basement brick building, s e cor. Liberty and Saratoga Sts.

D. E. Conklin, five-st'y brick warehouse, w s Sharp St., bet. Lombard and Pratt Sts.

James D. Hodge, 24 two-st'y brick buildings, s s Randall St., e of Light St.

F. Thiele, two-st'y brick building, w s Spring St., bet. Baltimore and Lombard Sts.

Wm. Schanze, two-st'y brick bake-house, e s Etting St., bet. Bloom and Gold Sts.

W. S. Smith & Bro., two-st'y brick shop, w s Maryland Ave., bet. Chase and Biddle Sts.

Boston.

BUILDING PERMITS. — *Brick.* — *East Concord St.*, near Albany St., Ward 18, for Trustees Mass. Homœopathic Hospital, hospital, 45′ x 86′, four-st'y pitch; David Connery & Co., builders.

Wellington St., No. 32, Ward 18, Henrietta K. White, Hotel White, 55′ x 90′, four-st'y flat; Thos. R. White, builder.

Bunker Hill St., No. 342, Ward 4, for City of Boston, engine-house, 40′ x 8.′, two-st'y hip; Robert R. Mayers, builder.

Wood. — *Washington St.*, rear, opp. Roslin St., Ward 24, for James A. King, storage, 21′ x 27′ and 33′, two-st'y flat; J. & F. H. McDonald, builders.

Evans St., Ward 24, for Esther M. Hutchinson, dwell., 14′ x 18′ and 23′ x 30′, two-st'y pitch; Samuel P. Faulkner, builder.

Harvard St., near Wales St., Ward 24, for Charles Ripley, dwell., 34′ and 40′ x 36′, two-st'y pitch; S. H. L. Pierce, builder.

Fuller St., rear, near Dorchester Ave., Ward 24, for Episcopal Church Society, carriage-house, 16′ 6″ x 30′, one-st'y pitch; Alden B. Beal, builder.

B St., No. 41, Ward 13, for Ellen Cronin, dwell., 25′ x 42′ 6″, three-st'y flat; Wm. W. Doomey, builder.

Alban St., near Ashmont St., Ward 24, for Augustus Nickerson, dwell., 31′ 6″ and 38′ x 40′, two-st'y pitch; John Savage, builder.

Taber St., No. 35, rear, Ward 20, for H. S. Lawrence, 2 dwells., 20′ x 38′, three-st'y flat; J. M. Marston & Co., builders.

Dorchester Ave., No. 576, Ward 15, for Jos. Batts, dwell., 22′ x 35′, three-st'y flat.

Blue Hill Ave., rear, near Lawrence Ave., Ward 24, for Darius H. Payson & Co., storage, 24′ x 51′ 6″, one-st'y flat; George W. Horton, builder.

Keyes St., near Washington St., Ward 23, for Boston Thread & Twine Co., drying-shed, 30′ x 103′, one-st'y pitch; C. H. Lewis, builder.

Spice St., near Cambridge St., Ward 4, for Allen D. Hall & Son, manufacturing, 46′ x 115′, four-st'y flat.

Unnamed St., near Crafts St., Ward 4, for Wm. R. Park; manufacturing, 34′ x 80′, two-st'y pitch.

Holmes Pl., near Mills St., for Frank R. Cushing, dwell., 14′ x 15′ and 20′ x 28′, one-st'y pitch.

Elm St., near Blue Hill Ave., Ward 24, for David Simonds, 2 dwells., 22′ and 31′ x 34′, two-st'y pitch.

Cushing Ave., near Sawyer Ave., Ward 24, for Sanford L. Treadwell, dwell., 21′ 6″ x 35′ 6″ x 32′, two-st'y pitch; Wm. J. Jobling, builder.

Church St., near Mt. Vernon St., Ward 25, Wm. H. Redhouse, dwell., 22′ x 30′, two-st'y pitch.

Saunders St., w s, Ward 22, for Amos Wright, 2 dwells., 20′ and 28′ x 14′ x 20′, two-st'y pitch, J. W. Berry, builder.

Cook St., near Washington St., Ward 24, for Wm. H. Cooper, dwell., 14′ x 15′ and 21′ x 28′, two-st'y pitch; J. H. Wilder, builder.

Unnamed St., near Stark St., Ward 4, for R. S. Barrett, dye-house, 23′ x 35′, two-st'y pitch; L. L. Libby.

Brooklyn.

ASYLUM. — The Brooklyn Nursery Association is about to erect a new building for a children's home in Herkimer St., near Kingston Ave., to cost, $30,000.

BUILDING PERMITS. — *Wall St.*, s s, 250′ e Broadway, two-st'y frame tenement and two-st'y frame shop, tin roofs; cost, $4,000; owner, Dora Blank, 474 Broadway; architect, R. Von Lehn; builders, L. Fuchs and J. Frey.

Pearl St., Nos. 124 *to* 130, w s, 100′s York St., four-st'y brick factory, gravel roofing; cost, $50,000; owners, L. Prahar & Bro., Five Points, Mission Pl., New York City; architect, E. Sniffen; builders, Van Dolson & Arnott and Jones & Taylor.

Myrtle Ave., Nos. 282 *and* 284, n s, e of Canton St., 2 four-st'y brick stores and tenements, tin roofs; cost, $16,000; owner, Henry Hoffman, Adams St.; architect, M. Thomas; builders, F. J. Kelly and Morris & Selover.

Green St., No. 112, near Oakland St., three-st'y frame double tenement, tin roof; cost, $4,000; owner, Geo. Kennert, 210 Green St.; architect, J. Mulhaul; builders, Randall & Miller.

Herkimer St., s s, 200′ e Kingston Ave., four-st'y brick building (Home for Children), tin roof; cost, $30,000; owner, the Brooklyn Nursery; architect, M. Thomas; builders, F. J. Kelly and Duryee & Losee.

Broadway, No. 891, e s, 25′ s Suydam St., three-st'y brick store and tenement, tin roof; cost, $6,300; owner, Jacob Sauerbrauns, Hamburg, Erie Co., New York; architect, T. Engelhardt; builders, G. Lehrian & Son and J. Frisse.

Union St., n s, 160′ e Smith St., 3 three-st'y brownstone front dwells., tin roofs, iron cornices; cost, each, $8,000; owner, W. H. Algie, 881 Tenth Ave., New York City; architect, J. Barrett; builder, P. Algie.

Meeker Ave., No. 88, s s, 210′ 8″ w North Henry St., three-st'y frame double tenement; cost, $3,600; owner, Jas. Canty, 40 Meeker Ave.; architects and builders, Sammis & Bedford; mason, L. Breziuski.

De Kalb Ave., s s, 150′ w Marcy Ave., 4 one-st'y brick double stores and tenements, gravel roofs; cost, total, $15,800; owner, R. L. Belknap, 203 Montague St.; architects and builders, H. D. and W. A. Southard.

Gates Ave., n s, 22′ 3″ w Reid Ave., 3 three-st'y brick stores and tenements, tin roofs; cost, total, $12,000; owner, Francis E. Pouch, 305 Adams St.; architect, G. R. Dietrick; builder, C. Dietrick.

Stanhope St., s s, 200′ w Evergreen Ave., 3 two-st'y frame dwells., tin roofs; cost, each, $1,600; owner and builder, E. C. Bauer, 22 Stanhope St.

Lincoln Pl., s s, 200′ w Seventh Ave., 5 four-st'y brownstone front dwells., tin roofs; owner and

Stuyvesant Ave., e s, 80′ n Pulaski St., two-st'y frame dwell., tin roof; cost, $3,200; owner and builder, John H. Miller, cor. Stuyvesant Ave. and Pulaski St.; architect, John Herr.

builder, Thos. Fagan, on premises; architect, R. Dixon.

Lorimer St., s e cor. Richardson St., 3 three-st'y brick tenements, tin roofs; cost, total, $11,000; owner, Martin Reynolds, 172 Jackson St.; architect and builder, A. Herbert; carpenter, J. Wilson.

Butler St., Nos. 102 *and* 104, s s, 160′ w Hoyt St., 2 three-st'y brick tenements, tin roofs; cost, each about $5,000; owner, Jno. F. Peppord, Hoyt St., cor. Dean St.; architect, F. E. Lockwood.

Jefferson St., n s, 106′ 5″ w Evergreen Ave., 3 two-st'y frame tenements, tin roofs; cost, each, $2,500; owner, C. Threshmann, 127 Jefferson St.; architect, T. Engelhardt.

Hicks St., w s, 25′ s Pineapple St., 5 three-st'y brownstone and brick front dwells., tin roofs and mansards; cost, each, $9,000; owner, Thos. P. Hurlbut, 104 Hicks St.; architect, G. L. Morse; builders, P. Carlin & Sons.

Berkeley Pl., Nos. 42 *and* 44, s s, 342′ w Sixth Ave., 2 three-st'y brownstone front dwells., tin roofs; cost, each, $5,000; owner, Catharine J. Tewell, 449 Ninth St.; architect, A. Hill; builder, E. Hughes.

Evergreen Ave., w s, 50′ s Stockholm St., 3 two-st'y frame dwells., tin roofs; cost, each, $2,000; owner, S. S. Morehouse, 516 Lexington Ave.; architect and builder, D. B. Morehouse.

Van Buren St., n s, 100′ e Stuyvesant Ave., 7 two-st'y brick dwells., tin roofs; cost, each, $2,750; owner and architect, Wm. Godfrey, 139 Stuyvesant Ave.; builder, J. D. Remsen.

Reid Ave., s w cor. Van Buren St., three-st'y brownstone front store and tenements, tin roofs; cost, each, $6,000; owner, Edward Webb, United States Hotel, New York City; architect, Wm. Godfrey.

Sixteenth St., n s, 198′ 5″ w Third Ave., 2 three-st'y brick flats, gravel roofs; cost, each, $3,000; Jas. S. Bailey, Harrison St., cor. Strong Pl.; architects and builders, Leclair & Greer; mason, H. O'Brien.

Lafayette Ave., n e cor. Ryerson St., four-st'y brick double flat, gravel roof; cost, $35,000; owner and builder, D. H. Fowler, 14 Verona Pl.; architect, A. Hill; mason, W. Kane.

Butler St., s s, 150′ w Classon Ave., four-st'y brick double tenement, tin roof; cost, $8,000; owner, F. J. Gilson, 656 Douglass St.; architect, T. F. Houghton; builders, P. McGuinn and D. Ryan.

Boerum St., s e cor. Humboldt St., 3 three-st'y frame store and tenements, tin roofs; cost, $5,000; owner, —— Zengle, Boerum St., near Humboldt St.; architect, J. Platt; builder, J. Rauth.

Tompkins Ave., No. 38, w s, 25′s Ellery St., three-st'y frame double tenement, tin roof; cost, $4,500; owner, Henry Rockelhauser, 30 Tompkins Ave.; architect, T. Engelhardt; builder, H. Loeffler.

Hart St., n s, 90′ e Sumner Ave.; also, *Lewis Ave.*, w s, 40′ s Hart St., 6 two-st'y brick, stone front dwells.; cost, each, $4,500; owner, Thos. J. Moore, 72 Sumner Ave.; architect and builder, Jno. Erickson.

Evergreen Ave., s w cor. Woodbine St., three-st'y brick store and flat, tin roof; cost, $8,000; owner, Louis Bradt, 512 Fulton St.; architect, J. D. Reynolds; builders, J. J. Cody and F. Marryatt.

Withers St., n w cor. Ewen St., 2 three-st'y frame double tenements, tin roofs; cost, $4,800 and $4,200; owner, Henry Warnke, 12 Judge St.; architect, G. Hillenbrand; builders, C. Buchheit and Thoma & Wade.

North Tenth St., n s, 225′ w Third St., four-st'y brick shop, gravel roof; cost, $13,000; owners, Poulson & Egar, North Eleventh St.; architect, F. Winslow; builders, W. & T. Lamb, Jr.

Marcy Ave., e s, 20′ s Putnam Ave., 4 two-st'y brownstone front dwells., tin roofs; cost, each, $5,000; owners and builders, Lambert & Mason, 148 Putnam Ave.; architect, A. Hill.

Marcy Ave., s e cor. Putnam Ave., three-st'y brownstone front dwell., tin roof; cost, $7,000; owners, etc., same as last.

Withers St., s s, 135′ e Humboldt St., 2 two-st'y frame tenements, tin roofs; cost, each, $2,100; owner, architect and builder, August Triukmann, 198 Withers St.; carpenter, H. C. Bauer.

Madison St., s s, 80′ e Tompkins Ave., two-st'y brick dwell., tin roof; cost, $4,500; owner, Paul C. Grening, 420 Gates Ave.

Halsey St., n e cor. Reid Ave., three-st'y brick store and tenement, tin roof; cost, $8,000; owner, Paul C. Grening, 420 Gates Ave.

ALTERATIONS. — *Putnam Ave., No.* 194, three-st'y and basement extension; cost, $3,500; owner, Jas. A. Blake, on premises; architect and builder, W. H. Burhans.

North Second St., s s, 192′ w Fifth St., raised four stories; cost, $6,000; owner, F. Haberman, on premises; architects, Thom & Wilson; builder, J. McQuaid.

Montague St., s w cor. Columbia Heights, one-st'y brick extension, tin roof; cost, $7,000; owner, Geo. I. Seney, 123 Remsen St.; architect, J. Mumford; builders, C. Cameron and W. C. Booth.

Ryerson St., e s, 67′ n Lafayette Ave., church raised and altered to flat, new front, etc.; cost, $10,500; owner and builder, D. H. Fowler, 14 Verona Pl.; architect, A. Hill; mason, W. Kane.

Chicago.

OFFICE-BUILDING. — Burnham & Root, architects, have completed plans for an office-building to be erected for Charles Counselman, ten-st'y, 60′ x 60′, Anderson pressed brick, and cost, $100,000.

HOUSES. — Burnham & Root, architects, have plans ready for 2 houses for Messrs. Mathews & Cornwell, to be of brick and brownstone, two-st'y, 50′ x 80′.

Plans by same architects are ready for house on Washington Boulevard, for Mr. Christy.

Same architects have completed plans for house to be built at Hyde Park, for Miss Barnett.

BUILDING PERMITS. — Jno. Watkins, three-st'y flats, 181 South Morgan St.; cost, $6,000; architect, Mr. Ruehl; builder, Jno. Gallagher.

Fred. Grothe, two-st'y and basement dwell., 587 West Twelfth St.; cost, $4,000; architect, P. W. Ruehl; builder, Chas. Threle.

Anton Melka, three-st'y dwell., 78 Ewing St.; architect, B. Ruehl; builder, Jno. Kralore; cost, $6,000.

Thos. Connelly, two-st'y dwell., 276 Loomis St.; cost, $4,000.

Albert Crane, 5 one-st'y cottages, 2935-2943 South Halsted St.; cost, $5,000.

Milo George, three-st'y flats, 248 East Indiana St.; cost, $6,500; builder, C. Busby.

C. Busby, two-st'y flats, 215-221 South Peoria St.; cost, $16,000; architect, C. M. Palmer; builder, C. Busby.

Ed. Kauer, three-st'y dwell., 195 East Superior St.; cost, $3,500.

G. Snydacker, 3 three-st'y dwells., Grand Boulevard, cor. Thirty-fifth St.; cost, $15,000; architect, F. Bowman; builder, J. Rutgford.

A. Jendrzejek, two-st'y and basement brick store and dwell., 657 Holt Ave.; cost, $6,000; architect, H. Meisner; builder, P. Wauzek.

P. W. Ruehl, two-st'y flats, 663 South Ashland Ave.; cost, $4,000.

M. W. Folz, two-st'y store and dwell., 506 Butler St.; cost, $3,200.

Geo. Morton, two-st'y store and dwell., 1128 Harrison St.; cost, $4,500.

F. W. Buehler, two-st'y and basement flats, 123 Twenty-first St.; cost, $2,500.

M. J. Illingworth, three-st'y flats, 352 and 354 Randolph St.; cost, $10,000; architect, Geo. Zucker; builder, Jno. Hall.

A. Rednarick, two-st'y and basement dwell., 15 Emma St.; cost, $3,400; builder, Peter Kaltenex.

A. Szerkoskie, two-st'y and basement dwell., 93 Cleaver St.; builder, Peter Kaltenex; cost, $3,700.

Mrs. Isabella McCleive, three-st'y and basement store and dwell., 627 West Van Buren St.; cost, $6,000; architect, John Clifford; builder, Fred. Housen.

R. Schmeling, two-st'y store and dwell., Milwaukee Ave.; cost, $3,000; builder, Fred. Housen.

Tho. Patterson, three-st'y and basement dwell.; cost, $5,000; architect and builder, J. H. Mathson.

C. Brinkman, two-st'y and basement dwell., 524 Union St.; cost, $4,000; architect, P. Ruehl; builders, Grosser & Hoppe.

C. A. Daniels, two-st'y dwell., 143 Sangamon St.; cost, $5,000; architect, W. Strippleman; builders, Grosser & Hoppe.

Mrs. T. Topping, two-st'y and basement store and dwell., 1031 West Madison St.; cost, $4,000; architect, A. Bates.

Ewing Estate, three-st'y warehouse-building, 55 and 57 Clinton St.; cost, $10,000; architect, J. M. Van Osdel; builder, Thos. Nicholson.

Samuel Cohen, three-st'y store and flats, 3653 Halsted St.; cost, $6,000; builders, Wm. Goldin & Son.

Knapick & Gilmeister, four-st'y factory; cost, $5,000.

Mrs. E. Fernow, two-st'y dwell., 646 Lasalle Ave.; cost, $6,000; architects, Trammonn & Jepson; builder, D. Kobell.

Wm. Woodrow, three-st'y flats, 111 South Morgan St.; cost, $6,000; architect, F. W. Cassell; builder, C. Champson.

A. Monke, two-st'y store and dwell., 430 North Lincoln St.; cost, $3,500.

S. E. Gross, 11 cottages, Western Ave.; cost, $11,000.

S. E. Gross, 10 cottages, Thomas St.; cost, $10,000.

S. E. Gross, 10 cottages, Shreve St.; cost, $10,000.

Wm. E. Rollo, 6 three-st'y dwells., 110-118 Monroe St.; cost, $14,000; architect, W. L. Carroll; builder, B. G. Robinson.

Chas. Moasar, three-st'y and basement store and flats, 153 North Ave.; cost, $8,000; architect and builder, Geo. Tegmeyer.

Theo. Klein, two-st'y and basement store and flats; cost, $5,000.

E. Harlan, 4 three-st'y and basement dwells., 529-535 Belden St.; cost, $16,000, architect, Geo. Spohr.

Marshall Field, 10 two-st'y dwells., Leavitt St.; cost, $14,000.

Jno. Dahmke, three-st'y and basement store and flats, 984-986 Lake St.; cost, $20,000; architects, Furst & Rudolph.

W. S. Brophy, two-st'y dwell., Monroe St.; cost, $6,500.

A. Booth, two-st'y barn; cost, $6,000; architect, Wadskier.

M. A. Eager, two-st'y dwell., Vernon Ave.; cost, $5,000; architect, A. Smith; builders, W. A. & A. E. Wells.

J. P. Hampson, three-st'y dwell., 326 East Indiana St.; cost, $6,000; architect, M. Hanson; builder, C. Luhring.

Chas. Sokup, four-st'y and basement stores and flats, 143 and 145 Front St.; cost, $10,000; architect, J. Zucker; builder, W. Mayne.

C. M. Hoffman, three-st'y stores and flats; cost, $5,000.

Cincinnati.

Building Permits. — Henry A. Stone, two-st'y brick building, 147 Richmond St.; cost, $4,000.

M. Tuitman, two-and-one-half-st'y brick building, 392 John St.; cost, $5,000.

Henry Bausch, two-st'y brick building, Corry St.; cost, $3,000.

Mrs. Mary Reiger, two-st'y brick building, Third St.; cost, $2,500.

Jos. Schroeder, three-st'y brick building, 357 Longworth St.; cost, $4,500.

Jos. S. Burnett, four-st'y brick building, e s Central Ave., between Eighth and Ninth Sts.; cost, $6,500.

T. McDonough, two-st'y frame building, Warsaw Pike; cost, $4,500.

Wm. E. Dibble, six-st'y brick warehouse, Nos. 5 and 7 West Fourth St.; cost, $9,000.

Robert Mitchell, repair six-st'y brick building, Baker St., between Vine and Race Sts.; cost, $3,000.

The Moerlein Brewing Company, three-st'y brick stables, n e cor. Henry and Dunlap Sts.; cost, $25,000.

Adam Deters, two-and-one-half-st'y brick building, 158 Oliver St.; cost, $4,000.

Wm. Ludlow, 2 two-st'y brick buildings, e cor. Kenton and Wayne Sts.; cost, $7,500.

W. M. Wicker, 2 three-st'y brick buildings, 475 Seventh St.; cost, $6,000.

Andy McCormack, three-st'y brick building, 158 Main St.; cost, $3,000.

New York.

Hotel Company. — Articles of incorporation of the Delmonico Company, having for its object the building and leasing of hotels in the United States, with a capital of $260,000, have been filed.

Building Permits. — *Fifty-second St., No.* 560, w, five-st'y brick tenement, tin roof; cost, $15,000; owner, John Klinker, s e cor. Eleventh Ave. and Fifty-second Sts.; architect, C. F. Ridder, Jr.

Fifty-second St., No. 562, w, five-st'y brick tenement and store, tin roof; cost, $11,000; owner, architect, etc., same as last.

Twenty-first St., No. 309, w, five-st'y brick tenement, tin roof; cost, $12,000; owner, architect and builder, Wm. S. Wright, 367 w Twenty-seventh St.

Washington Ave., n e cor. One Hundred and Seventy-fifth St., three-st'y frame dwell., tin roof; cost, $4,000; owner, Sarah A. Carman, 613 East One Hundred and Thirty-fifth St.; architect, Samuel B. Reed; mason, John Condon.

Brook Ave., e s, 50′ s One Hundred and Forty-second St., four-st'y frame tenement, tin roof; cost, $5,000; owner, James Martin, One Hundred and Forty-second St., s s, near Brook Ave.

Sixty-first St., n s, 200′ e Tenth Ave., five-st'y brick flat, tin roof; cost, $25,000; owner, Lula P. McGarry, 583 Monroe St., Brooklyn; architect, R. Rosenstock.

West Thirty-eighth St., No. 409, five-st'y brick tenement, tin roof; cost, $16,500; owner, Edward Gallan, executor, 305 West Forty-first St.; architect, M. L. Ungush; builder, E. L. Gallan.

Third Ave., w s, 61′ s One Hundred and Sixty-eighth St., 3 five-st'y brick tenements, tin roofs; cost, $11,000; owner, Jacob Stahl, Franklin Ave., near One Hundred and Sixty-ninth St.; architect, Julius Kastner.

Third Ave., w s One Hundred and Fifty-first St., s One Hundred and Sixty-eighth St., five-st'y brick factory, tin roof; cost, $10,000; owner and architect, same as last.

Suffolk St., No. 33, three-st'y brick store, tin roof; cost, $7,000; owner, James Barclay, 64 West Thirty-eighth St.; architect, Julius Boekell.

Sixty-first St., n s, 200′ w Tenth Ave. (8 houses), *Sixty-ninth St.*, s s, 100′ w Eleventh Ave. (4 houses) 12 five-st'y brick tenements, tin roofs; cost, $18,000; owner and builder, Ed. A. Davis, s w cor. Eleventh Ave. and Sixty-ninth St.; architect, Jas. Barrett.

First Ave., e s Twenty-fifth, s One Hundred and Fifth St., 4 five-st'y brownstone tenements and stores, tin roofs; cost, $16,000; owner, Alice Transmann, 212 East One Hundred and Fifth St.; architects, Babcock & McAvoy.

East Sixteenth St., Nos. 525 *and* 527, 2 five-st'y brick tenements, tin roofs; cost, $9,000; owner, Michael Larkin, 350 East Fifteenth St.; architect, Fed. Jewth.

West Forty-seventh St., No. 416, five-st'y brick tenement, tin roof; cost, $16,000; owner, Nicholas F. Seebeck, 97 Wall St.; architect, Wm. Grant.

Seventy-eighth St., s s, 94′ w Ave. A, four-st'y brick tenement, tin roof; cost, $15,500; owner, John Warneke, s w cor. Ave. A and Sixty-eighth St.; architect, John Brandt.

Philadelphia.

Church. — *Locust St.*, above Fifteenth St., alteration and addition to Calvary Church; Wilson Bros. & Co., architects.

Building Permits. — *Fortieth St.*, n w cor. Eglesfield St., two-st'y stable, 30′ x 75′; Jas. J. Ryan, owner.

Paul St., No. 4715, three-st'y dwell., 23′ x 55′; S. W. Evans, Jr.

Moyamensing Ave., 2 three-st'y dwells., 16′ x 55′.

Arch St., No. 823, second-st'y addition to brick building, 19′ x 65′; Gilbert & Bacon, owners.

Smedley St., s of Venango St., two-st'y dwell., 14′ x 49′; Lucas Hocker, owner.

Simmons St., s of Poplar St., 10 two-st'y dwells., 13′ x 34′; W. H. Bilyeu, owner.

Pulaski Ave., n of Apley St., stable, 24′ x 32′; H. F. Whartman, contractor.

Wayne St., n w cor. Schoolhouse Lane, three-st'y dwell., 40′ x 52′; Wm. Garvin, contractor.

Broad St., n of Lehigh Ave., one-st'y addition to brick building, 28′ x 93′; Beidler & Childs, owners.

Mansion Ave., w of Ripka St., 2 three-st'y dwells., 16′ x 33′; Bukanire, owner.

Woodvale Ave., n of Ridge Ave., three-st'y dwell., 16′ x 30′; J. Lehman, contractor.

Amber St., w of Clearfield St., 2 two-st'y dwells., 13′ x 38′; W. Schoenlabor, contractor.

Erson Ave., No. 412, three-st'y dwell., 15′ x 30′; Jno. Kuntz, owner.

North Fifth St., No. 932, three-st'y dwell., 19′ x 62′; H. M. Martin, contractor.

Germantown Ave., No. 4949, three-st'y warehouse, 21′ x 55′; L. S. Tull, owner.

Humboldt St., No. 1026, two-st'y dwell., 16′ x 30′; Jno. Tragebar, owner.

Thompson St., e of Somerset St., two-st'y dwell., 20′ x 46′; Jno. Mitchell, contractor.

Locust St., No. 1530, three-st'y brick building, 20′ x 76′; Kemp & Garrison, contractors.

Reed St., n w cor. Mole St., 4 two-st'y dwells., 15′ x 36′; D. Garrison, owner.

South Juniper St., two-st'y addition to stable, 18′ x 40′; J. H. Erickson, contractor.

Broad St., s from Norris St., 16 three-st'y dwells., 14, 17′ x 69; 1, 30′ x 60; 1, 19′ x 60′; also on Norris St., w of Broad St., 5 two-st'y dwells., 16′ x 55′; Jno. M. Sharp, owner.

Arch St., No. 732, three-st'y back building, 17′ x 90′, and front alterations; Andrew White.

Jackson St., No. 2836, two-st'y store and dwell., 16′ x 45′; W. Mulligan, owner.

Twenty-third St., cor. Ellsworth St., three-st'y store and dwell., 18′ x 54′; J. McGurk, owner.

Salmon St., n w cor. Allegheny Ave., 2 three-st'y dwells., 20′ x 47′, 18′ x 47′; A. M. Linn, contractor.

Ringold St., s of Montgomery Ave., 6 two-st'y dwells., 14′ x 38′; Charles W. Coulson, owner.

Carlisle St., bet. Norris and Diamond Sts., 21 two-st'y dwells., 15′ x 50′.

Broad St., n of Berks St., 4 three-st'y dwells., 18′ x 94′; also on Fountain St., e of Sixteenth St., two-st'y dwell., 13′ x 28′; M. Carey Lee.

Chestnut St., n w cor. Albion St., two-st'y church and school-house, 72′ x 157′; Geo. McNichols, contractor.

Gray's Ferry Road, below Twenty-eighth St., extension and renewal of works, 72′ x 90′; Henry Brown, owner.

Thirty-third St., cor. Willow Grove Ave., three-st'y hotel, 230′ x 250′; also Southampton Ave. w of Germantown Road (Chestnut Hill), three-st'y dwell., 30′ x 30′; W. C. Mackie, contractor.

Fritsch St., s of K St., two-st'y dwell., 15′ x 30′; also on K St., w of Kensington Ave., two-st'y dwell., 14′ x 30′; D. C. Schuler, contractor.

Spruce St., s of Twenty-second St., four-st'y dwell., 23′ x 75′; Chas. W. Budd, contractor.

South St., No. 629, three-st'y store and dwell., 14′ x 58′; L. Koder, contractor.

South Fifteenth St., No. 134, four-st'y dwell., 16′ x 58′; C. W. Glocker, owner.

Thompson St., n of Hanover St., two-st'y dwell., 48 x 66′; also on Norris St., w of Belgrade St., 2 two-st'y dwells., 16′ x 40′ and 18′ x 50′; J. S. Balat & Son.

Southerland Ave., s of Bainbridge St., two-st'y store-house, 31′ x 34′; H. C. Fox & Son, owners.

Front St., s w cor. Market St., five-st'y store, 25′ x 30′; Jacob Rush, contractor.

Fernon St., No. 1710, two-st'y dwell., 15′ x 28′; Wm. Galbraith, owner.

Allegheny Ave., w of Jasper St;, three-st'y dwell., 18′ x 30′; Robt. McFarland, owner.

Alterations. — *North Thirty-fifth St., No.* 302, alteration and addition to residence of John A. Wilson, Esq.; Wilson Bros. & Co., architects.

South Seventeenth St., No. 223, alteration and addition to residence of H. K. Kelley; Wilson Bros. & Co., architects.

St. Louis.

Building Permits. — Missouri Gymnastic Society, additional st'y to gymnasium; cost, $5,000; Furlong, architect; R. K. Chasman, contractor.

Charles Cronenbold, brick glue factory; cost, $2,500; Beatie, architect; Thos. Gugerty, contractor.

W. A. Niebling, brick dwell.; cost, $4,000; J. A Niebling, architect and contractor.

B. H. Schwietering, brick dwell.; cost, $3,000; Bisser Bros., contractors.

Albert Voigt, brick dwell.; cost, $4,000; Beinke, architect; C. H. Poetner, contractor.

Jacob Loesch, brick tenement; cost, $4,000; Philip Saurwine, contractor.

W. M. Stinemeyer, double brick tenements; cost, $4,000; Beckimeyer, architect: Charles Wehking, contractor.

Patrick Leahey, 2 adjacent tenements; cost, $4,000; O. W. Bleck, architect; sub-let.

Mrs. Mary E. Fanner, 3 adjacent brick dwells.; cost, $4,500; Rude & Luke, contractors.

Two adjacent brick dwells.; cost, $3,000; Wendelin Roth, contractor.

L. Hannekan, brick store below, rooms above; cost, $3,200; B. Koesters, contractor.

Charles Bauer, brick dwell.; cost, $5,800; H. E. Peipers, architect; J. V. Majors, contractor.

Mrs. Motz, 2 adjacent brick tenements; cost, $2,600; Helm Bros., contractors.

Joseph Grelle, brick tenement; cost, $3,500; Uhri, architect; Jno. W. Frye, contractor.

Wm. Noewry, brick dwell.; cost, $3,200; Debt mans, architect; Jacob Robinson, contractor.

J. D. Lucas, store and office-building; cost, $80,000; McGrath, architect; B. Weber & Co., contractors.

J. B. Ghio, alteration of dwell. into store; cost, $8,300; Grable, architect; S. C. McCormac, contractor.

Otto Moser, 2 adjacent brick dwells.; cost, $7,300; Jungenfeldt, architect; Chas. Wehking, contractor.

O. T. Madden, 2 adjacent brick dwells.; cost, $4,600; McNarra, architect; Jos. Flanery, contractor.

Wm. Kennedy, 3 adjacent brick dwells.; cost, $8,000; J. D. Fitzgibson, architect and contractor.

St. Louis type foundry, addition to the foundry; cost, $8,000; C. E. Illsley, architect and contractor.

Sharman, brick dwell.; cost, $5,000; W. E. Bent, architect; J. C. Bonsack, contractor.

General Notes.

Batavia, O. — Clermont County, O., is to have a brick poor-house, 101′ x 103′; built from plans prepared by S. W. Rogers, architect. It will accommodate 200 persons, and will cost about $30,000. The corner-stone was laid July 26.

Bryn Mawr, Pa. — Gardener's cottage, for George Vaux, Esq.; Addison Hutton, architect, Philadelphia.

Burlington, N. J. — Mr. G. A. Todd proposes alteration and addition to his residence, and the erection of a new stable; Wilson Bros. & Co., architects, Philadelphia.

Champaign, Ill. — Messrs. Burnham & Root architects, of Chicago, have completed plans for house to be erected for Mr. A. C. Burnham, two-st'y, 60′ x 90′, high roof.

Chicopee, Mass. — The River Railroad Company will begin work at once on the brick depot at the Center.

The Belcher & Taylor Agricultural Tool Company have awarded the contract for their new storehouse and blacksmith shop to D. B. Griggs & Son, and work will be begun at once.

Creston, Io. — Messrs. Burnham & Root, are architects for the library-building, to be stone basement, and two-st'y, brick.

Epping, Mass. — The B. W. Hoyt Company proposes to build a new shoe factory, 40′ x 216′.

Findlay, O. — Ground has been broken for the foundation of the new college, and the work will now be pushed forward. The main building will be brick with stone trimmings, 162′ front, four-st'y. Mr. M. Rumbaugh, a former Cincinnati architect, is in charge.

Hartford, Conn. — The Connecticut Fire Insurance Company will erect at the cor. of Grove and Prospect Sts., a structure 58′ x 120′, one-and-two-st'y high, and in the Byzantine style.

The American Architect and Building News

ADVERTISERS' TRADE SUPPLEMENT.

No. 15. SATURDAY, AUGUST 4, 1883. Volume XIV. No. 397.

THE SAYERS AUTOMATIC VENTILATORS.

The accompanying illustrations represent the Sayers Automatic Skylight Ventilator. Figure 1 represents the outer face, and Figure 2 a section showing the louvres as closed in high winds and storms. The louvres, as may be seen, are made in a rectangular form, which gives them a double bearing to the wind, and, being hung on axles, the louvres close and open automatically with the varying pressure of the wind, high winds entirely closing the louvres as shown in Figure 2 (see the advertisement of the manufacturers, given on another page, where the louvres are represented in the open position). In order to render this ventilator absolutely weather-proof in driving storms, each louvre is made with a lip at its upper angle, which, with the overlapping edges of the upper louvres when closed, form joints impervious to the heaviest storms. *A*, Figure 2, is the top stop which makes the space over the top louvre weather-proof; *J* is the bottom stop, made with a lip at its upper edge, which is overlapped by the edge of the lower louvre when the latter is closed in a storm; *E E* is a chamber at each end of the ventilator, which makes the joints at the ends of the louvres absolutely storm-proof; these ventilators are also provided with a condensation catch-basin, *F*, so that any dripping that may arise from this cause is carried to the exterior of the building, through the openings *J*, in the rain stop. These ventilators are made of heavy galvanized-iron and constructed in the most durable manner, and being made with a flange running around the face, are used in both metal and wooden skylights; they are also used in stone and brick walls. Where so used they are set in a wood frame built into the wall; they can also be secured by the flange in the board walls of stables and other out-buildings. The many important advantages of the Sayers ventilators are so apparent that they scarcely require to be stated. That they fill a valuable office in the ventilation of buildings is acknowledged by every architect who is familiar with them, and which is abundantly proved by the rapid manner in which they are being put into buildings. The most important advantage of the Sayers ventilators is that they secure the constant ventilation of buildings under all conditions of weather. The serious objections to the use of the swinging sash, with its costly adjusting apparatus, which requires to be closed during changeable and stormy weather, and, through neglect of janitors, is allowed to remain closed the greater part of time, are by use of the Sayers ventilators entirely obviated; being entirely automatic, they do not require attention at any time, and being absolutely storm-proof, they afford perfect security from heavy winds and storms blowing into the building. The Sayers ventilators, being simple, reliable, perfect in operation, and universal in their

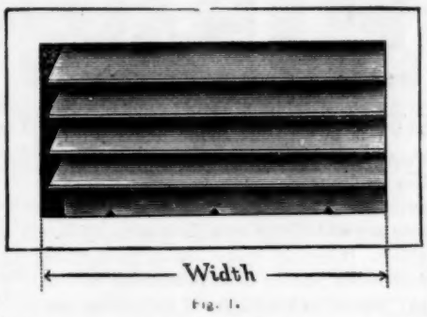


Fig. 1.

application, may justly be regarded as the standard of excellence in ventilators, and in every essential point as superior to any ever before presented to the public. The Sayers ventilators are now in extensive use in store windows, skylights, private residences, stables,

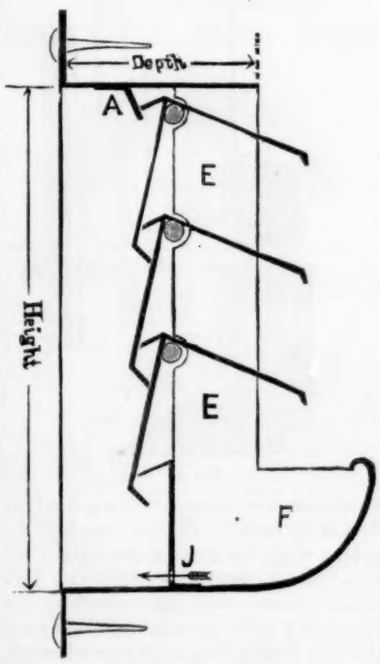


Fig. 2.

etc., and are now being put into seven of the public and high schools of Chicago, the St. Patrick Academy and the Lutheran Hospital of the same city. The various forms of these ventilators are supplied to the building trade in all parts of the United States. For other important applications of the Sayers ventilators, particularly the ventilation of store windows, which absolutely prevents freezing of the windows during the most intense frosty weather, see our illustrated catalogue, which is mailed free on application.

W. S. SAYERS & CO.,
113 East Adams St., Chicago, Ill.

BOSTON'S AMERICAN INDUSTRIAL EXHIBITION.

The National Exhibition of American Industries and Resources, which will be held in Boston during the coming months of September and October, under the auspices of the New England Manufacturers' and Mechanics' Institute, will be one of the most interesting and instructive exhibitions ever held in New England. The several Southern States and the great railroad systems of the West have been invited to make such displays of their varied resources as will best illustrate the many advantages of those sections, and have an interest to the people of the East. From present indications, the prospect for a large and comprehensive display from these distant sections is very flattering.

Though the South is richly endowed by nature with all those essentials which give wealth and prosperity to a people, circumstances have delayed the utilization of these advantages; but now the field is open to all, and all are invited to seek fortune within her borders. Within the past ten years the South has made much progress in the development of new industries, and the future possibilities of that section are beginning to attract no little attention throughout the world. With the view of bringing these advantages to the notice of home capitalists and manufacturers, and to acquaint the farmer and mechanic with the prospects of the South, the New England Institute has invited the several States to exhibit their resources at the National Exhibition this fall. The South is fully appreciative of this opportunity for advertising herself to the world, and active measures are being taken by the progressive men of the several States to have such displays as will be most interesting to the people of New England. The results of this exhibition will be very beneficial to the people of both sections, North and South. By making a display of these resources, the South will interest capitalists and manufacturers, whose co-operation will give immediate development to the various Southern industries.

Among the States to be represented are North Carolina, South Carolina, Georgia, Ten-

nessee, Mississippi and Louisiana, whose displays of material of all kinds it is impossible here to enumerate. Each State will make a distinct exhibit, which will illustrate the resources of each. Iron, zinc, copper, silver and gold ores; coal and minerals; ornamental marbles, building-stones and granites; large collections of agricultural products, and specimens of valuable forestry, together with samples of manufactured products, will be comprised in the displays from the South. The resources of the West will be largely displayed by the Union Pacific and Missouri Pacific railroads. From the republic of Mexico will also come a large exhibit, demonstrating the mineral and agricultural wealth of that country. General Greenwood, Mayor of the city of Mexico, who lately spent some days in Boston, is very enthusiastic over the subject, and promises to interest himself personally in securing a Mexican display.

While a large portion of the floor-space is to be occupied by exhibits from the South and West, New England manufacturers will also have a goodly representation. With the exhibits from the South there will come hundreds of visitors from these States — men who are engaged in various industrial pursuits, and who are in search of the latest improved machinery for the factory, workshop and farm, and while these Southern buyers are here, let the best of New England's productions be displayed. Machinery of all kinds is in great demand in the South to build, and to develop new industries, and the opportunity now offered should not be neglected by the enterprising manufacturers at home. The liberal policy of the New England Institute, in making no charge for space, and in furnishing season-tickets of admission to exhibitors and assistants without cost, somewhat lessens the expense of exhibiting. Exhibitors are still further favored by the various railroads and express companies, who have kindly agreed to half-rates on all goods shipped to the Exhibition, and, if unsold, to return goods to the original shipper at same rate. This liberal arrangement will also accommodate exhibitors from New York and Pennsylvania.

Parties desiring to take advantage of this valuable opportunity to advertise their goods, or to introduce new inventions and novelties, should make early application, as the first to apply are the first ones to secure space. More than five hundred applications are now on file at the office of the Institute. Further particulars can be had by addressing

JOHN F. WOOD,
Treasurer New England Manufacturers' and Mechanics' Institute,
38 Hawley St., Boston, Mass.

ELEVATORS — THEIR NEED AND USE.

The enormous extent to which machinery is now used in nearly every kind of productive enterprise carried on in this country has had the effect of engaging talent and skill in its improvement. There is no specialty in machinery that has increased in use so much of late years as elevators. Great progress has been made in their shape, gearing and adaptation, and as in other devices and business some few names have a decided reputation for excellence. Among such elevators are the hydraulic elevators of Elias Brewer, whose facilities are of the best for producing any size elevator on the hydraulic system. As many of our readers are perhaps unaware of the advantages of the hydraulic plan over steam, we may enumerate a few.

Water elevators have features which are well worth while for any man who requires an elevator to consider. In the first place it is always ready at any time of day or night, and it is the cheapest machine in the market. You can have any degree of power that you desire without danger of explosion; you can also have any speed you want, and you can go slow or fast; you do away with a fireman and engineer; there is no coal to buy; no delay for repair of boiler and getting up steam; it is always ready, and it is so simple in operation that a little boy eight years old can run it with ease. One advantage of an elevator is that it makes the top floor of your building let more readily than the lower floor on account of its being much lighter. Owners of buildings lose enough rent every year, by the top floor being idle, to pay for one or two elevators.

Fig. 1.

The above cut represents a hand elevator, which is in very great demand in all the French flats, hotels, and other small buildings, four or five stories high, to carry up groceries, and coal and wood, and in some places they are made large enough to carry up furniture. It has two brakes, one to brake while descending, and the other to hold the load in any position to keep it from descending, and yet has no interference with the ascension of the elevator, and both are operated by the same check-rope, which is a great feature that very few have yet attained. This new design

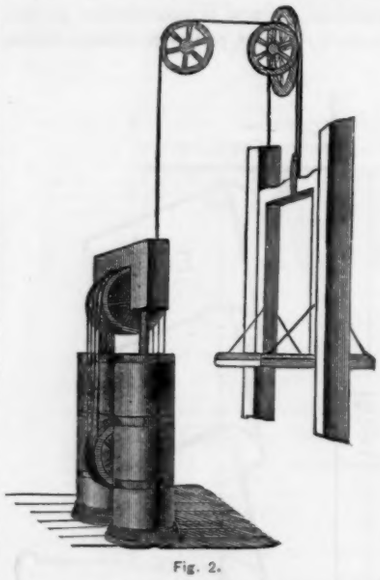


Fig. 2.

can be made much cheaper than any other elevator in the market. Another branch of the business which has grown exceedingly of late is the hydraulic dumb-waiter in private residences, to carry food and dishes from the kitchen to the dining-room, which does away with that hard pulling on a rope when you have a large dinner, and all the noise that dumb-waiters usually make. This thing can be started by a little child four years old, either at top or bottom; it runs up itself and is perfectly noiseless. Mr. Brewer has patterns to make them all sizes, and at a very moderate price; and also small elevators to carry up an invalid, at a very low price to suit all classes of people, so that every man that can build a house can afford one of these.

Cut No. 2 represents a small hydraulic machine, used for passenger purposes and freight. It has thirty per cent less friction than any other hydraulic elevator machine that is made, and uses thirty per cent less water than any other, on account of its having only one rope, which is of great strength. The car has safety devices which cannot be beaten; and the inventor is willing to stand on the car and cut the rope, to show that it is perfectly safe. The Boston city officials have tested the Brewer safety devices, a record of which tests can be had at the City-Hall, Boston.

The undersigned has United States and Canada patents on inventions of elevators; and also testimonials from all who have purchased and used his make. He is thoroughly practical, and has all the facilities necessary to ensure excellent workmanship and dispatch on all orders. His works are at Chelsea, Mass., or he can be addressed as

ELIAS BREWER,
267 Federal St., Boston, Mass.

IRON BUILDINGS.

Messrs. A. Northrop & Co., of Pittsburgh, the well-known manufacturers of Iron Roofing, have recently been putting up iron ceilings for stores, shops, churches, schools, and public buildings. They are put in in a variety of patterns, and are fast taking the place of old plaster ceilings, as well as being extensively used in new iron buildings.

In cleanliness, fire-proof qualities and strength, and ability to resist injury from jars, blows, water and strains that would injure or destroy a plaster or wood ceiling, the merits of iron need no commendation; while its adaptability to a variety of neat designs, including corners and centre-pieces, will be understood by seeing a few of the patterns made by this firm.

The ceilings are easily put on, and in place of old ceilings it is not necessary to remove the old plaster or wood, thus avoiding the annoyance of dirt and dust from such work.

The inventors make the following claims and assertions.

Plaster ceiling, no matter how cheap, may prove to be the *most expensive ceiling* that can be used, especially in buildings where there is much heavy work on the floors over it, such as the rolling of barrels, tumbling of heavy boxes of goods, or the jarring of machinery; but particularly in halls, churches and school-buildings, where the ceiling is next to the roof. Very few roofs, even if perfect when new, remain perfectly tight for a great length of time, and a small leakage soon loosens the plaster, or stains the frescoing sufficiently to destroy the beauty and value of the ceiling, even if no damage is done by falling plaster. The iron ceiling, painted up in fresco colors, costs no more than a plaster ceiling covered with fresco painting, and presents a far more attractive appearance, while it is not subject to the failures of either plaster or wood ceilings.

Wood ceilings, while not open to the same objections as plaster, are still very objectionable on account of their liability to shrink and to permit dirt to sift through, but more especially on account of their inflammability, while their cost, if put up in the same attractive

manner and shape in which the iron is put on, would exceed the cost of iron. Sheet-iron ceiling is therefore (all things considered) the cheapest as well as the best for use in the class of buildings mentioned.

These ceilings can be hung to the joists ordinarily used for plaster.

They are now in use in the different States, and four car loads have lately been shipped for immediate use in Buffalo, New York.

A. NORTHROP & CO.,
97 FIRST AVE., PITTSBURGH, PA.

NOTES.

THE Yale & Towne Manufacturing Company, Stamford, Conn., have entered into arrangements under which they intend developing the numerous inventions in scales, gauges and testing-machines of Mr. Albert H. Emery, the inventor and designer of the celebrated Government testing-machine in the arsenal at Watertown, Mass. They are at present building three fifty-ton Emery testing-machines.

THE National Exposition of Railway Appliances, lately held at Chicago, awarded to Keuffel & Esser, of 127 Fulton and 42 Ann Sts., New York, four gold and bronze medals.

The only gold medal awarded for surveying, engineering and drawing materials.

The only medal awarded for drawing-tables.

The only medal awarded for engineers' levelling-rods.

The only medal awarded for engineers' railway curves.

THE following appears in the London *Times* of 2d ult. (page 5): The prize jury of the Hygienic Exhibition at Berlin, (Germany) has awarded a gold medal to the Neuchatel Asphalte Company, for exhibits of their manufactures.

BUILDING INTELLIGENCE.

General Notes.

SPRINGFIELD, O.—College-buildings, brick and stone; cost, about $60,000; E. O. Fallis, architect, Toledo, Ohio.

TAUNTON, MASS.—The building of a new schoolhouse on Barnum St., the cost not to exceed $10,000, has been authorized by the city government.

TOLEDO, O.—St. Clair St., near Madison St., five-st'y and basement office-building, brick and stone, 61' x 114'; owners, Messrs. Cummings & Carrington; architect, N. B. Bacon; builder, E. Malone; cost, about $60,000.

Collingwood Ave., frame dwell. for Mr. Cone; cost, about $4,000; Gibbs & Stine, architects.

Plans are being prepared by Gibbs & Stine, for additional city school buildings to the amount of about $15,000.